

VILNIUS GEDIMINAS TECHNICAL UNIVERSITY

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**ANALYSIS OF URBAN
SUSTAINABILITY PROCESS AND
QUALITY OF LIFE EVALUATION**

SUMMARY OF DOCTORAL DISSERTATION

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CIVIL ENGINEERING (02T)



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VILNIAUS GEDIMINO TECHNIKOS UNIVERSITETAS

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MIESTŲ DARNOS PROCESO ANALIZĖ IR GYVENIMO KOKYBĖS VERTINIMAS

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Introduction

Topicality of the problem

World integration processes, constantly increasing population in the cities, which are covering larger and larger territories, cause urban growth problems. Current urbanization level in Lithuania makes up 66.7 per cent (i.e. part of people living in the cities). It is prognosed that in 2020 urbanization will reach 72–75 per cent. When planning urban residential territories, identifying their development trends and ranking them on a priority basis, the evaluation of the quality of life in urban territories shall be carried out. However, the system of such evaluation indicators which does not comply with the principles of sustainable development would have an adverse impact on the urban planning process, would not ensure the sustainability and monitoring of development. All mentioned above may have a negative impact and increase differentiation between separate urban territories as well as reduce the wellbeing of urban population.

Lithuania is a new member country of the European Union, the main feature of which is rapid and huge changes. This has an impact on Lithuanian cities, which in the European context develop rather chaotically and extremely unsteadily. The most topical problems are enumerated below:

1. Insufficiently humanized urban environment, consequences of urban development as well as environmental, social and economic requirements are not taken into consideration.
2. When solving urban development tasks, there is a lack of complexity and comprehensively planned residential areas that are equipped with engineering and social infrastructure.
3. Political processes have a considerable impact on the planning. When municipality decision-makers and officers change, the continuity of urban development is not maintained; strategic aims are sacrificed in favour of short-term benefit. Investments into urban development, financing of measures important for the functioning of the city as well as ranking of their priorities are not substantiated.
4. High quality norms of urban territory planning are not available and the systems of the quality of life evaluation and urban development monitoring have not been worked out.

To summarize all problems mentioned above it shall be pointed out that separate urban territories develop unevenly and disparities between them are noticed. Therefore, trends of urban residential areas' development unevenness are distinguished; socially and economically negative territories characterized by extremely low quality of life develop; the threat of cities characterized by considerable economic and social stagnation and ecological instability arises.

To ensure sustainable development of urban territories, focus should be laid on the steady development of acquired territories, determination of development factors and identification of the system of indicators guaranteeing the quality of life. The system of indicators shall cover economic, social, environmental aspects and humanize the existing territories, including indicators which reflect the needs of society and public interest. Urban visions and the creation of urban image shall be based on the evaluation of quality of life in residential areas.

It is considered that housing market is one of the most important indicators reflecting the economic condition of the country. Therefore, these markets are of great interest to researchers, who are trying to identify the factors determining the change of prices in the housing market. There is no doubt about the importance of real estate price being one of the key indicators reflecting the level of urban economic development and quality of life. Therefore, it is important to study the relationship between real estate price and urban quality of life indicators.

Research object

The general object of this study is urban areas, their development according sustainable development principles and the assessment of the consequences. The naeow study object is Vilnius city and its residential areas.

Aim and tasks of the work

The aim of this work is to construct a theoretical model of the quality of life evaluation based on sustainable development principles and which would measure factors influencing the quality of life through the use of multi-dimensional statistical analysis. The proposed model may be applied when analyzing and solving urban territory development problems.

To achieve the aim of the work, the following tasks were set:

1. To analyze scientific literature, describing the concepts of urban sustainability and sustainable development in urbanized territories. To clarify how the concepts of sustainability and sustainable development are defined, to explain the meaning and consequences of sustainability in the context of planning. To identify the controversies of the concepts found in scientific publications. Moreover, to survey the prevailing controversies of using sustainability and sustainable development concepts in the urban planning context. To clarify the notion of sustainable city model.
2. To study the notion of quality of life applied in urbanized territories. To identify factors influencing the quality of life in urban territories, to evaluate the interaction of these factors. To analyze the conception of quality of life and the constructed evaluation models, to investigate the conducted studies in the field.

3. To construct a theoretical model of urban territory evaluation, which would enable to evaluate the factors influencing the quality of life and which may be applied when analyzing and solving urban territory planning problems in the future. To select multi-dimensional statistical analysis methods suitable for the evaluation of urban residential areas' development from the point of view of high quality of life, applying geographical information system (GIS) technologies. To identify and clarify the system of indicators, based on sustainable development principles, which ensure the quality of life in urban territories and impact on the steady development of urban territories.
4. Through the use of the newly constructed model to verify practically the compliance of Vilnius city territories to sustainability and quality of life in them. Based on the principles of the model, to create the system which enables to identify the features of separate urban districts' development, possible development alternatives, achievable permitted marginal values of quality of life and to distinguish relatively homogeneous groups of city districts.

Methodology of research

The latest scientific literature from scientific data bases was used in the work. Sustainability and sustained development concepts in the context of urbanized territories, sustainable city development model and quality of life notion are explained. Modern concepts defining urban quality of life are described and factors influencing the quality of life in urban territories are determined.

Having analyzed the research materials, urban quality of life evaluation model is constructed. Indicators ensuring and describing the quality of life are identified and proposed.

In the empirical study the following methods of multi-dimensional statistical analysis were used: the method of key components, factorial analysis, multi-dimensional regression analysis method, cluster analysis. Initial hypotheses were verified with the help of these statistical methods.

When evaluating the impact of visual living environment quality on the price of real estate in Vilnius, both the opinion of the city residents (qualitative indicators), and social-economic (quantitative) indicators enabling to achieve the expected quality of life were used. The aim of this study was to connect the data obtained from the survey of Vilnius city residents conducted by JSC "Rait" in 2005 and official statistical data collected by the author about Vilnius city transport districts, part of which is presented in the General plan of Vilnius city.

For the purpose of this study, after the factors determining real estate price in the city of Vilnius were identified, cluster analysis was used to distinguish relatively homogeneous groups of districts of Vilnius city. This method was

integrated with the geographical information systems (GIS), which allowed to present the research findings visually.

Scientific novelty

In this dissertation the following new findings were obtained for civil engineering:

1. The quality of life evaluation model in urbanized territories was constructed. Statistical methods to evaluate the quality of life and to identify urban homogenous zones were proposed for the new model.
2. The system of indicators showing and evaluating quality of life integrated into the territorial planning is presented and concrete indicators are proposed. Indicators were grouped into 9 groups: communication systems, social environment, economic environment, utilities, safety/crime rate, environmental protection, leisure, culture and population communicability, city maintenance and care, city management and planning.

Practical value

Comprehensive analysis of sustainability, sustainable development and quality of life concepts was conducted. General characteristics were described and conflict between the concepts was identified. The concept of quality of life was evaluated, previously constructed models and used methods were found and described;

The theoretical model consisting of three stages and eight parts was proposed to evaluate the quality of life in urbanized territories. Qualitative and quantitative data base of Vilnius city, which may be used to evaluate the quality of life and to identify the relationship between the indicators was created.

The method how to apply the constructed model practically following the example of Vilnius city was proposed, real dependences and homogeneous city zones were identified.

Defended propositions

Three defended propositions were developed by the author:

1. Quality of life – the result of sustainable development, which may be outline like attractiveness of a certain location in the city and evaluated as a condition meeting the expectations and wishes of the city residents.
2. The constructed theoretical model enables to evaluate the quality of life in urban territories and may be applied when determining and analyzing the condition and development of urban territories.
3. Housing price is one of the key integrated indicators, reflecting the level of urban economic development, attractiveness of a certain location in the city and quality of life.

The scope of the scientific work. The scientific work consists of the general characteristic of the dissertation, three chapters, conclusions, list of literature, list of publications and 4 annexes were attached. The total scope of the dissertation – 121 pages, 22 pictures, 11 tables and 4 addenda.

1. Sustainable development principles and quality of life concept

Currently, the scope of application of sustainability and sustained development concepts is rather wide. A lot of reports, scientific articles and books that address this topic are available. This work focuses on sustainability and sustainable development in territorial planning. Theoretical understanding about sustainability is vague as a lot of various interpretations on what it really means are available. The vagueness of this concept causes further problems: it is difficult to understand what sustainable development is. Frequently, urban and regional development strategies and incentives are too much concentrated on ecological and economic sustainability; whereas social sustainability with social problems and inequality are ignored. Moreover, the problem related to the shifting of sustainability from global to local or urban level exists.

These problems arise due to vague and unclear concept of sustainable development. However, if city planners clearly identify conflict between different sustainable development elements and attempt to combine them, such sustainability becomes a reference point from which to start urban planning. One of the ways how to combine different elements of sustainability is the creation of sustainable city visions and models, which would cover all sustainability and sustainable development elements. To construct sustainable city model, indicators evaluating sustainability shall be determined. It has been acknowledged that quality of life is also increasingly being seen as an essential element for sustainable development. However, there is no consensus on how to define it precisely and how to relate it. Therefore, research into urban quality of life attracts growing interest of researchers, city developers and decision-makers. Various interpretations and the evaluation of the urban quality of life reveal that there is huge scientific interest in conducting studies into quality of life. Meanwhile, it is difficult to reach a consensual concept of quality of life and underlying dimensions to be used for its assessment. These studies are crucial as urban quality of life is being increasingly seen as an essential driving force of urban development.

The analysis and survey of urban quality of life concept enables to consider that some researchers consider quality of life as an objective concept, whereas others as a subjective one. Some scientists interpret the concept of quality of life as life satisfaction, others as a point of departure from which a person starts to enjoy life. Differences between the concepts of quality of life encouraged to study the relationship between objective and subjective factors determining urban quality of life. Therefore, to coin a comprehensive definition of urban

quality of life, according to the author, both quantitative and qualitative factors influencing it shall be taken into account. When evaluating quality of life both objectively and subjectively, dependable and weighty results may be expected. The combination of evaluating subjective and objective quality of life factors enables to compare variations between these two perspectives.

Frequently, the quality of life concept in sustainable city visions and models is ignored, and the concept of quality of life is not integrated into urban planning in practice. City planners and decision-makers ignore the evaluation of the needs determining urban quality of life. However, to enlarge and develop a city sustainably, city residents and communities shall participate in the creation of the vision of the city and planning processes. Therefore, there is a demand for further investigations, which would help to coin a comprehensive definition of urban quality of life, to develop methods of its evaluation and control, to determine indicators to be employed and how they could contribute to the creation of a sustainable city. Therefore, the creation of a multi-purpose and versatile model evaluating urban quality of life is of utmost importance. Such versatile quality of life evaluation model may be useful for specialists and representatives in different fields, such as urban planning, architecture, environmental engineering, civil engineering, public health and policy-making.

2. Evaluation model of quality of life in territorial planning

There is plenty of research and surveys of scientific literature that address the topic of quality of life and sustainable development indicators; however, there is a lack of practical application of these two indicators' groups in territorial planning. Therefore, undoubtedly, due to the novelty of this work and its practical application, scientific research into the identification of indicators shall be continued. Thus, one of the tasks of this dissertation is to develop the quality of life model. The quality of life evaluation model developed and proposed by the author enables to practically evaluate sustainable development process in Lithuanian regions or cities. Holistically, various elements of sustainable development are combined and investigated through a selected algorithm. As a result, sustainable development trends, which are reflected by indicators, are obtained. This model has been implemented in the Lithuanian territorial planning system and it aims to identify quality of life both through subjective and objective indicators (Fig. 1).

The constructed and proposed model, which is used to evaluate quality of life, is divided into 3 stages and 8 parts.

First of all, the first stage consists of model application area and the determination of the following research parameters: the aims of drafted territorial planning document, research localization, the context of studied location and its role on a wider scale, public promotion process, identification of target groups, sample size (Part 1.1). In Part 1.2 a questionnaire is presented and applied to

identify the main factors influencing on the urban quality of life. Both qualitative and quantitative quality of life are selected in advance, which may not be obtained from official statistical sources.

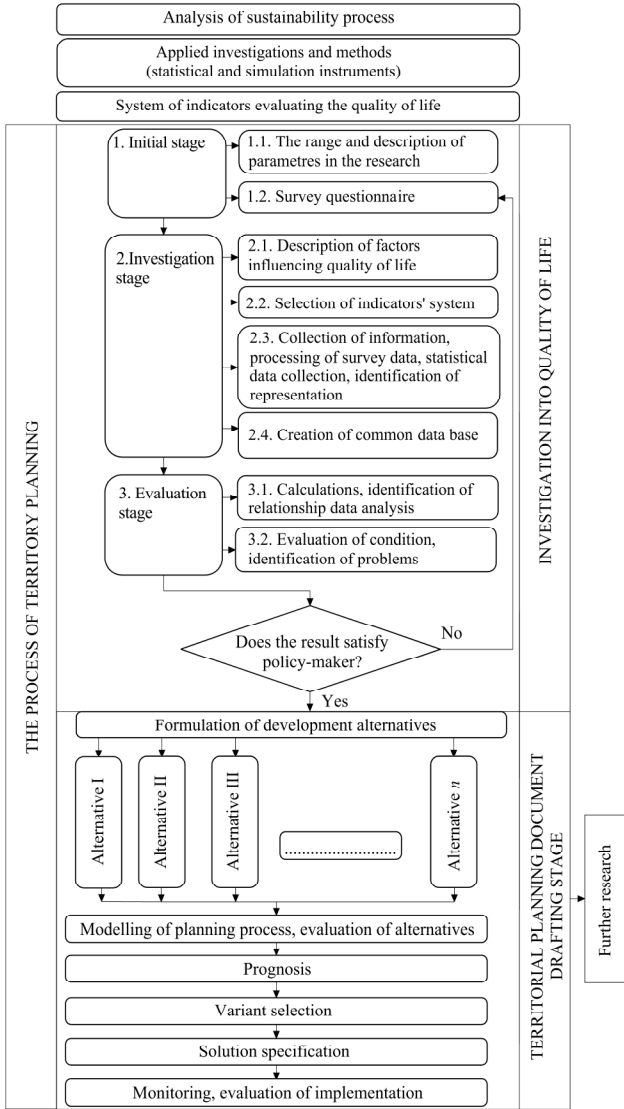


Fig. 1. Model of the quality of life evaluation and its integration into urban planning

The investigation stage consists of four parts. First of all, in Part 2.1 of the questionnaire, based on the outcomes, the understanding of residents about quality of life is defined, factors influencing on it are identified and the tasks of territorial planning document are set. In Part 2.2 a territorial planning specialist (a group of specialists) selects indicators for complex evaluation according to the identified factors. In Part 2.3 data is collected from official statistical data sources; respondents' representation and accessibility of the data from official statistical sources are identified. In part 2.4 common data base from the questionnaire and official statistical sources is created.

In the evaluation stage quality of life is analyzed. In Part 3.1 data base analysis is conducted and relationship is identified. Finally, in Part 3.2 calculations to solve a concrete task are conducted, conclusions on how the determined indicators meet the key principles of sustainable development, including positive trends and negative changes, are made.

The evaluation model proposed by the author emphasizes a necessity to understand the factors influencing urban quality of life from the point of view of society and, based on the outcomes, to set the tasks of the drafted territorial planning document as well as to select suitable indicators. It is assumed that in such case expert-society relationship becomes closer. Therefore, urban communities and society at large are provided a possibility to identify city problems which are important to them and influence the quality of life evaluation and the whole urban planning process. To illustrate practical application of the proposed model, the survey of Vilnius city residents on the strategic plan 2010–2020 conducted by the order of Vilnius city municipality was used. Sections of the survey report on the current city problems, such as identification of the current condition and city development until 2020, evaluation of the city visions were studied. The survey findings reveal the topics and factors influencing the quality of life, pointed out by the city residents. Fourteen key topics were identified. These topics were grouped by the author into 9 subcategories: communication system, social environment, economic environment, utilities, safety/crime rate, environmental protection, leisure, culture and communicability of inhabitants, city maintenance and care, city management and planning. The grouped topics are subjective.

The findings of the survey of Vilnius residents reveal that in order to present urban quality of life holistically indicators are required. The indicators evaluating the general urban quality of life, obtained from the survey of Vilnius residents (subjective quality of life) and quantitative indicators (objective quality of life) obtained from official statistical sources, are proposed. The author has selected 104 indicators for 9 indicator groups: communication systems – 17, social environment – 17, economic environment – 16, utilities – 5, safety/crime rate – 8, environmental protection – 11, leisure, culture and population communicability – 12, city maintenance and care – 8, city management and

planning – 10. They are not final or exceptional and it is clear that certain indicators could be included into one or more categories.

Detailed evaluation of these indicators is not carried out in this dissertation due to a lack of data. The author only proposes the indicators determining the quality of life. The evaluation will be carried out in future research, where indicators themselves, their values and correlation between them will be specified.

To identify factors evaluating quality of life in the proposed model the viewpoint of society is taken into consideration and the model is suitable to be applied in urban and regional planning. The number and type of factors may vary depending on the characteristics of a city or a region and data available. The impact of factors on planning may be different depending on physical, geographical, environmental and social-economic conditions.

3. Impact of quality of life on real estate price assessment

In this concrete investigation it is aimed to identify how housing and quality of life are evaluated in Vilnius city and its separate districts; how social and economic indicators are distributed across various territories of the city and how real estate price and social-economic indicators' relationship in space is identified. This research aims at combining the data received by the survey of Vilnius residents carried out by JSC "Rait" in 2005, and proposed by author official statistical data on transport districts that some are marked in the comprehensive plan of the city of Vilnius. The author put forward 2 hypotheses to identify the factors determining the changes in the price of real estate in different Vilnius districts. The first hypothesis suggested that the price of real estate was conditioned by the home, work and leisure environments, while the second one said that the changes in the price of real state are highly affected by the prestige of the residential area.

Five factors distinguished from the research data (home, work, leisure, safety and health, centre and aesthetics) were analysed by relating them with average prices of flats in different transport districts of Vilnius in 2005–2010. The period of 2005–2010 was special as the economic crisis of that time determined the reduction of the "price bubble".

The residents' opinion, that is, the relation between five factors distinguished and the annual change in prices in Vilnius districts, was assessed using the model of multi-dimensional statistical analysis:

$$y = \beta_0 + \sum_{i=1}^k \beta_i x_i + \varepsilon \quad (1)$$

where β_j – unknown parameters, ε – random quantity with zero arithmetic mean and variance δ^2 .

It was established that in 2005–2010 two factors, namely work, health and safety, had no impact on changes in the price of flats in Vilnius transport districts. The conclusion was made that two variables had the greatest impact on the price of flats in Vilnius residential districts. The first variable was related to the “home” factor which had negative effect in 2005–2008. The second variable was the joint factor of “centre and aesthetics” with the positive effect which remained during the changes in the “price bubble” (2009–2010). It was determined that in terms of the principles of sustainable development the residents usually associated the quality of life with the concept of the quality of the closest living environment and the centre and aesthetics, i.e., the concept of prestige. According to the residents, the factor “centre and aesthetics” means prestigious and high quality living environment. Such environment is Vilnius districts that are the closest to the city centre and characterised by larger green areas. The factor “home” had the greatest negative effect on districts where the average population density was 40–120 per ha. After the resultant factors were identified, the analysis was continued to prove or deny the hypotheses put forward. The analysis found out that according to the capital residents the price of real estate was mostly effected by the prestige of the Vilnius district – prices remained high next to the protected areas. The research determined the precise values of the factor “centre and aesthetics”, and Vilnius districts were grouped into six clusters consisting of the following components:

- Cluster 1 consists of four districts in the heart of Vilnius: Centre II, Old Town, Žvėrynas, Naujamiestis;
- Cluster 2 consists of six Vilnius districts: Centre I, Antakalnis, Santariškės, Baltupiai, Šnipiškės, Žirmūnai II;
- Cluster 3 consists of eleven Vilnius districts (most of which are residential districts with multi-apartment houses of 40–30 years old);
- Cluster 4 consists of two districts: Pilaitė I and Naujininkai;
- Cluster 5 consists of five peripheral Vilnius districts (Dvarčionys, N. Vilnia etc);
- Cluster 6 consists of two districts: Verkiai and A. Paneriai, that is, the remaining peripheral Vilnius districts.

General conclusions

After developing the model of assessment of quality of life in urban areas, there were formulated the following scientific and practical conclusions:

1. So far it is not clear how sustainability should be applied practically in urban planning. The survey reveals that the concepts of quality of environment, quality of life, urban vitality and sustainability overlap; however, all of them are related with person-environment relationship studies. The latter research reveals that application of both subjective

- and objective indicators is the most suitable method to evaluate quality of life, and the obtained results may be successfully used in urban planning.
2. Frequently, the concept of urban quality of life is ignored in sustainable city visions and models, and the notion of quality of life is not practically integrated into urban planning. The general aim of this study is to enhance the notion of quality of life as the key element of sustainable development. The study contributes to the creation of practically applied system of evaluating the suitability of quality of life in urbanized territories.
 3. The system consisting of eight parts and three stages of the proposed model presents the quality of life evaluation method in the context of sustainable development. The quality of life evaluation system is based on the key principles of sustainable development. It is flexible and easily applied in various planning objects and levels. It is an evaluation process open to society, which, first of all, defines and determines the quality of life factors through the opinion expressed by residents and proposes ultimate indicators of quality of life. The constructed quality of life evaluation model may be successfully applied in Lithuanian cities and regions.
 4. The author proposed the system to determine the quality of life factors and to create indicators, which are adapted to the circumstances of a concrete location. The system may be applied in different ways independently from the evaluation level (national, regional, city or separate city territory). A universal set of quality of life indicators was proposed; however, significant physical, geographical, economic and social-cultural differences between various cities exist, which requires a unique set of indicators. Although most of the groups of indicators proposed in this study may be similar, some of them may be distinguished depending on the different viewpoint of society in separate places.
 5. Technology development changes people's minds, priorities and the quality of life evaluation. Consequently, the changing concept of a prestigious flat is reflected in the changes of flat prices. Housing prices is one of the main indicators reflecting the economic development level and urban and regional quality of life. Although the changes of real estate market have been widely investigated in the world, so far there is no uniform research methodology as consensus has not been reached on what factors and indicators trigger and stimulate these difficult-to-manage sudden developments of real estate market. Real estate market, price leaps, impact on the residents' quality of life analysis are topical for the theory and practice of real estate.

6. To identify factors determining the real estate price change in separate districts of Vilnius, two hypotheses were put forward. The study revealed that the city residents mostly associate the quality of life with home, the concept of the quality of the closest living environment and the centre and aesthetics. According to the residents, the factor “centre and aesthetics” means prestigious and high quality living environment. Such environment is Vilnius city districts that are the closest to the city centre – Centras I, Senamiestis, Naujamiestis, Žvėrynas. These districts have a lot culture heritage objects, intensively restored and as well have the highest housing prices.

List of Published Works on the Topic of the Dissertation In the reviewed scientific periodical publications

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In the other editions

Burinskienė, M.; Rudzkiene, V.; Venckauskaitė, J. 2011. Models of Factors Influencing the Real Estate Price, in *Proceedings of the VIII International Conference „Environmental Engineering“, held in Vilnius on 19–20 May, 2011*. [8-osios tarptautinės konferencijos „Aplinkos inžinerija“, įvykusios Vilniuje 2011 m. gegužės 19–20 d., medžiaga], Vilnius: Technika, 873–878. ISBN 978-9955-28-829-9

About the author

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MIESTŲ DARNOS PROCESŲ ANALIZĖ IR GYVENIMO KOKYBĖS VERTINIMAS

Problemos formulavimas

Vykstant pasaulinės integracijos procesams, nuolat augant gyventojų skaičiui miestuose, užimančiuose vis didesnę teritoriją, aktualios tampa miestų plėtros problemos. Dabartinis urbanizacijos lygis Lietuvoje 66,7 % (t. y. žmonių gyvenančių mieste dalis). Prognozuojama, jog 2020 m. urbanizacija pasieks 72–75 %. Planuojant miesto gyvenamąsias teritorijas, nustatant jų vystymo kryptis ir prioritetinę eilę turi būti atliekamas urbanizuotų teritorijų gyvenimo kokybės vertinimas. Tačiau tokio vertinimo rodiklių sistema, neatitinkanti darnios plėtros principų, neigiamai įtakotų miesto planavimo procesą, neužtikrintų plėtros įgyvendinamumo tęstinumo bei monitoringo. Visa tai gali neigiamai įtakoti bei didinti skirtumus tarp atskirų miesto teritorijų ir mažinti miesto gyventojų gerovę.

Lietuva – nauja Europos Sąjungos narė, kurios pagrindinis bruožas yra spartūs ir didelio masto pokyčiai. Tai įtakoja ir Lietuvos miestus, kurie Europos kontekste vystosi gana chaotiškai ir labai netolygiai. Žemiau pateikiamos aktualiausios problemos:

1. Nepakankamai kompleksiskai įvertinama miesto aplinka ir miesto plėtros pasekmės, aplinkosauginiai, socialiniai ir ekonominiai reikalavimai.
2. Suplanuotos teritorijos neatitinka darnios plėtros principų. Trūksta kompleksiskai suplanuotų ir aprūpintų inžinerine bei socialine infrastruktūra gyvenamųjų teritorijų.
3. Politiniai procesai ženkliai įtakoja planavimą. Keičiantis savivaldybių politikams neišlaikomas miestų plėtros tęstinumas ir miestų strateginiai tikslai aukojami dėl trumpalaikės naudos. Dažnai investicijos į miesto plėtrą, jų finansavimas ir prioritetų nustatymas sprendžiamas nepagrįstai.
4. Nėra kokybiškai parengtų miesto teritorijų planavimo normatyvų, bei nesukurtos gyvenimo kokybės vertinimo ir miesto plėtros monitoringo sistemos.

Apibendrinant aukščiau įvardintas problemas, pastebima, kad atskiros miesto teritorijos vystosi netolygiai, pastebimi skirtumai tarp jų. Taip išryškėja miesto gyvenamųjų vietovių plėtros netolygumo tendencijos, formuojasi socialiai ir ekonomiškai negatyvios teritorijos pačiuose miestuose, kurios pasižymi ypač žema gyvenimo kokybe, iškyla didelių ekonominių, socialinių bei ekologinių problemų.

Darniai miesto teritorijų plėtrai užtikrinti didžiausią dėmesį reikia skirti tolygiam teritorijų įsisavinimui, gyvenimo kokybės veiksnių įvertinimui bei gyvenimo kokybę garantuojančių rodiklių sistemos nustatymui. Rodiklių sistema

turi apimti ekonominius, socialinius, aplinkosauginius darnios plėtros elementus, humanizuoti esamas teritorijas ir atspindinčius visuomenės poreikius. Gyvenamųjų teritorijų gyvenimo kokybės vertinimas turi argumentuoti miesto vizijas bei miesto įvaizdžio kūrimą.

Yra manoma, jog būsto rinka yra vienas iš svarbiausių rodiklių, nusakančių šalies ekonomikos būklę. Taigi, šios rinkos yra įdomi tema mokslininkams, kurie bando nustatyti veiksnius, įtakančius kainų pokyčius būsto rinkoje. Be abejonės, nekilnojamojo turto kaina yra vienas iš pagrindinių rodiklių, atspindinčių miestų ekonominio išsivystymo lygį ir gyvenimo kokybę. Todėl svarbu išnagrinėti ryšį tarp nekilnojamojo turto kainos bei gyvenimo kokybę nusakančių rodiklių mieste.

Tyrimų objektas

Bendrajį tyrimų objektą sudaro miesto teritorijų išvystymo lygis ir plėtra bei atitikimo darnios plėtros principams ir pasekmių gyvenimo kokybei įvertinimas. Siaurasis tyrimo objektas – nagrinėjamas Vilniaus miestas ir jo gyvenamosios teritorijos.

Darbo tikslas ir uždaviniai

Šio darbo pagrindinis tikslas – sukurti gyvenimo kokybės vertinimo mieste modelį, grįstą darnios plėtros principais ir kuris daugiamačės statistinės analizės metodais įvertintų gyvenimo kokybę nusakančius veiksnius. Pasiūlytas modelis gali būti taikomas analizuoti ir spręsti miesto teritorijų vystymo problemas.

Darbo tikslui pasiekti buvo suformuluoti šie uždaviniai:

1. Išanalizuoti mokslinę literatūrą, aprašančią ir vertinančią miestų darnumą ir darnią plėtrą urbanizuotose teritorijose. Išaiškinti kaip šiandien apibrėžiamos darnumo ir darnios plėtros sąvokos bei kokia yra darnumo prasmė ir pasekmės miestų planavimui. Nustatyti mokslinėse publikacijose randamus sąvokų prieštaravimus. Įvertinti kokie darnumo ir darnios plėtros koncepcijų naudojimo prieštaravimai vyrauja miestų planavime. Išaiškinti darnaus miesto modelio sampratą.
2. Išnagrinėti gyvenimo kokybės sampratą, taikomą urbanizuotose teritorijose. Nustatyti veiksnius, kurie lemia gyvenimo kokybę miesto teritorijose, įvertinti šių veiksnių tarpusavio ryšius. Išanalizuoti gyvenimo kokybės koncepciją bei jau sukurtus vertinimo modelius, išnagrinėti anksčiau atliktus šios srities tyrimus.
3. Sukurti miesto teritorijos įvertinimo teorinį modelį, kompleksiskai įvertinti gyvenimo kokybę nusakančius veiksnius ir kuris gali būti taikomas analizuoti ir spręsti miesto teritorijų vystymosi problemas. Parinkti daugiamačės statistinės analizės metodus, tinkančius miesto gyvenamųjų teritorijų plėtrai įvertinti gyvenimo kokybės požiūriu, taikant juos su geografinių informacinių sistemų (GIS) technologijomis. Nustatyti ir išaiškinti darnios plėtros principais grįstą ir gyvenimo

kokybę miesto teritorijose užtikrinančią rodiklių sistemą, turinčią įtakos tolygiam miesto teritorijų vystymui.

4. Naudojant naujai sukurtą modelį praktiškai patikrinti Vilniaus miesto teritorijų darnumą ir gyvenimo kokybę jose. Modelio principais remiantis, sudaryti sistemą, padedančią nustatyti atskirų miesto rajonų plėtros savybes, galimas vystimosi alternatyvas, pasiekiamas leistinas ribines gyvenimo kokybės reikšmes bei išskirti santykinai homogenines miesto rajonų grupes.

Tyrimų metodika

Darbe buvo panaudota naujausia mokslinė literatūra iš mokslinių duomenų bazių. Tokiu būdu išaiškinta darnumo bei darnios plėtros sąvokos urbanizuotų teritorijų kontekste, darnaus miesto plėtros modelio ir gyvenimo kokybės samprata, aprašytos šiuolaikinės gyvenimo kokybę miestuose apibūdinančios koncepcijos bei nustatyti veiksniai, kurie lemia gyvenimo kokybę miesto teritorijose.

Išanalizavus literatūrą, sudarytas miesto gyvenimo kokybę vertinantis modelis. Pasiūlyti gyvenimo kokybę užtikrinantys ir nusakantys rodikliai.

Empiriniame tyrime buvo panaudoti šie daugiamatės statistinės analizės metodai: pagrindinių komponentų metodas, faktorinė analizė, daugiamatės regresinės analizės metodas, klasterinė analizė. Šių statistinių metodų pagalba buvo tikrinamos pirminės hipotezės.

Vertinant vizualios gyvenamosios aplinkos kokybės įtaką nekilnojamojo turto kainai, Vilniuje buvo panaudota tiek šio miesto gyventojų nuomonė (kokybiniai rodikliai), tiek ir socialiniai-ekonominiai (kiekybiniai) rodikliai, kurie leidžia pasiekti norimą gyvenimo kokybę. Šio tyrimo tikslas ir buvo sujungti duomenis, kurie buvo gauti 2005 m. UAB „Rait“ atliktos Vilniaus miesto gyventojų apklausos metu ir oficialius statistinius autorės surinktus duomenis apie Vilniaus m. transportinius rajonus, kurių dalis pateikta Vilniaus miesto bendrajame plane.

Tyrimo eigoje, nustačius veiksnius, kurie daro įtaką nekilnojamojo turto kainai Vilniaus mieste ir norint išskirti santykinai homogenines Vilniaus miesto rajonų grupes, buvo panaudota klasterinė analizė. Šis metodas buvo integruojamas su geografinėmis informacinėmis sistemomis (GIS). Tokiu būdu tyrimo rezultatai buvo pateikti vizualine forma.

Mokslinis naujumas

Rengiant disertaciją buvo gauti šie statybos inžinerijos mokslui nauji rezultatai:

1. Sukurtas gyvenimo kokybę urbanizuotose teritorijose įvertinantis modelis. Naujai sukurtam modeliui pasiūlyti statistiniai metodai gyvenimo kokybei įvertinti bei miesto homogeninėms zonoms nustatyti.

2. Pateikta integruota į teritorijų planavimą gyvenimo kokybę nusakančių ir įvertinančių rodiklių sistema bei pasiūlyti konkretūs rodikliai, kurie autorės buvo sugrupuoti į 9 grupes: susisiekimo sistema, socialinė aplinka, ekonominė aplinka, komunalinės paslaugos, saugumas/nusikalstamumas, aplinkosauga, laisvalaikis, kultūra ir gyventojų bendruomeniškumas, miesto tvarkymas, miesto valdymas ir planavimas.

Praktinė vertė

Atlikta išsami darnumo, darnios plėtros bei gyvenimo kokybės sampratos analizė. Aprašytos bendros charakteristikos bei nustatyti sąvokų prieštaravimai tarpusavyje. Įvertinta gyvenimo kokybės koncepcija, atrasti ir apibūdinti anksčiau sukurti modeliai bei naudojami metodai.

Pasiūlytas trijų etapų ir aštuonių dalių teorinis modelis, gyvenimo kokybei urbanizuotose teritorijose įvertinti. Sudaryta Vilniaus miesto atskiras teritorijas apibūdinančių kokybinių ir kiekybinių rodiklių duomenų bazė, kuri gali būti naudojama gyvenimo kokybės vertinimui bei miesto teritorijų rodiklių tarpusavio ryšiams nustatyti.

Pasiūlytas būdas, kaip sukurtą modelį pritaikyti praktiškai Vilniaus miesto pavyzdžiu, nustatytos realios priklausomybės tarp analizuotų rodiklių ir išskirtos homogeninės miesto zonos.

Ginamieji teiginiai

Autorės buvo suformuluoti šie trys ginamieji teiginiai:

1. Gyvenimo kokybė – tai darnios plėtros principais pasiekiamas rezultatas, nusakantis atskirų miesto teritorijų patrauklumą ir sąlyga atitinkanti gyventojų lūkesčius ir galimybes.
2. Sukurtas teorinis modelis leidžia įvertinti gyvenimo kokybę miesto teritorijose ir gali būti taikomas sprendžiant ir analizuojant miesto teritorijų būklę bei vystimąsi.
3. Būsto kaina – vienas pagrindinių integruotų rodiklių, apibūdinančių miesto ekonominio išsivystymo lygį ir atskirų teritorijų patrauklumą, bei gyvenimo kokybę jose.

Darbo apimtis. Darbą sudaro įvadas, trys skyriai, išvados, literatūros sąrašas, publikacijų sąrašas ir priedai. Bendra disertacijos apimtis – 121 puslapis, 22 iliustracijos, 11 lentelių ir 4 priedai.

Pirmame disertacijos skyriuje nagrinėjama mokslinė literatūra bei ekspertų vertinimai apie darnumo prigimtį, pačios sąvokos naudojimą bei kaip darnumas ir darni plėtra yra apibrėžiama šiandien. Išnagrinėta gyvenimo kokybės samprata. Skyriaus pabaigoje formuluojamos išvados ir tikslinami disertacijos uždaviniai.

Antrajame skyriuje nustatyti veiksniai, kurie lemia gyvenimo kokybę miesto teritorijose. Pasiūlytas modelis, kuris leidžia įvertinti gyvenimo kokybę

nusakančius veiksmus ir gali būti taikomas analizuojant ir sprendžiant miesto teritorijų vystymosi problemas.

Trečiajame skyriuje empirinio tyrimo pagalba nustatytos atskirų miesto rajonų plėtros savybės ir išskirtos santykinai homogeninės miesto rajonų grupės.

Disertacijos pabaigoje pateikiamos išvados ir literatūros šaltinių sąrašas.

Bendrosios išvados

Nustačius gyvenimo kokybę veikiančius veiksmus mieste ir sudarius gyvenimo kokybės vertinimo modelį, atlikus pagal šį modelį empirinį tyrimą, suformuluotos šios mokslinės ir praktinės išvados:

1. Sąvokų apžvalga rodo, kad aplinkos kokybės, gyvenimo kokybės, miesto gyvybingumo ir darnumo koncepcijos persidengia, tačiau visos siejamos su asmens-aplinkos santykio tyrimais. Pastarieji moksliniai tyrimai atskleidžia, kad abiejų tiek objektyvių, tiek subjektyvių rodiklių taikymas yra tinkamiausias būdas gyvenimo kokybei matuoti, o gauti rezultatai sėkmingai gali būti naudojami miestų planavime.
2. Gyvenimo kokybės sąvoka darnaus miesto vizijoje ir modeliuose yra ignoruojama, o gyvenimo kokybės koncepcija praktiškai nėra integruojama į miestų planavimą. Bendras šio tyrimo tikslas paskirtas gyvenimo kokybės, kaip darnios plėtros pagrindinio elemento, suvokimui stiprinti. Tyrimas prisideda prie nuolatinių praktiškai taikomos, tinkamos gyvenimo kokybės įvertinimo urbanizuotose teritorijose sistemos kūrimo.
3. Siūlomo modelio aštuonių dalių ir trijų etapų sistema pateikia gyvenimo kokybės praktinio vertinimo metodą darnaus vystymosi kontekste. Ji yra lanksti ir lengvai pritaikoma įvairiems planavimo objektams ir lygmenims. Tai atviras visuomenei vertinimo procesas, kuris pirmiausia apibrėžia ir nustato gyvenimo kokybės veiksmus per išreikštą gyventojų nuomonę, tokiu būdu siūlomi galutiniai gyvenimo kokybės rodikliai. Sukurtas gyvenimo kokybę įvertinantis modelis gali būti sėkmingai taikomas Lietuvos miestams, bei regionams, o jo principai užsienio šalyse.
4. Autorė pasiūlė sistemą gyvenimo kokybės veiksnių nustatymui ir rodiklių kūrimui, kuri pritaikoma prie konkrečiai teritorijai. Sistema gali būti taikoma įvairiai, nepriklausomai nuo vertinimo lygmens (ar vertinama nacionaliniu, regioniniu, miesto ar atskiros miesto teritorijos). Pasiūlytas universalus gyvenimo kokybės rodiklių rinkinys, tačiau egzistuoja reikšmingi atskirų miestų fiziniai, geografiniai, ekonominiai ir socialiniai-kultūriniai skirtumai, kurie reikalauja unikalios rodiklių aibės. Nors daugelis, šio tyrimo pasiūlytų rodiklių grupių skirtinguose urbanizuotose teritorijose gali būti panašios, kai kurios gali išsiskirti priklausomai nuo skirtingo visuomenės požiūrio atskirose vietovėse.

5. Technologijų vystymasis pamažu keičia žmonių sąmonę, prioritetus, bei gyvenimo kokybės vertinimą. To pasekoje, kintanti prestižinio būsto sąvoka atsispindi būsto kainų pokyčiuose. Būsto kainos yra vienas iš pagrindinių rodiklių, atspindinčių miestų ir rajonų ekonominio išsivystymo lygį ir gyvenimo kokybę atskirose miesto teritorijose. Nekilnojamojo turto kainos ir jos kitimo tyrimai yra aktualūs gyvenimo kokybės rodiklių taikymui miestų planavime.
6. Siekiant nustatyti veiksnių įtakojančių nekilnojamojo turto kainų kitimą atskiruose Vilniaus rajonuose buvo iškeltos dvi hipotezės. Nustatyta, kad gyvenimo kokybę miesto gyventojai labiausiai sieja su namais – artimiausios gyvenamosios aplinkos kokybės sąvoka, bei „Centru ir estetika“. Veiksnyis „Centras ir estetika“, gyventojų nuomone, suvokiama kaip prestižinė ir kokybiška gyvenamoji aplinka. Tai būdinga centre esantiems keturiems Vilniaus miesto rajonams, kurie pasižymi gausiausiu kultūros paveldu ir intensyviai analizuojamu laikotarpiu atnaujinama gyvenamąja aplinka, o tuo pačiu didžiausiomis būsto kainomis (Centras I, Senamiestis, Naujamiestis, Žvėrynas).

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Padėka

Ypatingai dėkoju darbo vadovei, Miestų statybos katedros vedėjai prof. dr. Marijai Burinskienei už neįkainojamą pagalbą bei patarimus rašant šį darbą. Nuoširdžiai dėkoju visiems Miestų statybos katedros ir Teritorijų planavimo mokslo instituto kolegoms už palaikymą ir pagalbą rašant šį darbą.

Esu dėkinga savo artimiesiems ir draugams už palaikymą ir kantrybę.

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ANALYSIS OF URBAN SUSTAINABILITY PROCESS AND
QUALITY OF LIFE EVALUATION

Summary of Doctoral Dissertation
Technological Sciences, Civil Engineering (02T)

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MIESTŲ DARNOS PROCESO ANALIZĖ
IR GYVENIMO KOKYBĖS VERTINIMAS

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