

Rurban Landscapes: Characterization, Assessment, Regulation of Changes

Erika Zaleskienė*¹, Indrė Gražulevičiūtė-Vileniškė²

*Kaunas University of Technology, Department of Architecture and Land Management
Studentu st. 48, Kaunas LT-51367*

Tel. +370 37 451546, e-mail: erika.brinkyte@gmail.com, indre.grazuleviciute@ktu.lt

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Abstract

This article presents analysis of new kind of spaces which are forming in rural and urban landscapes interface zones in sustainable development context. The study aims to formulate and develop conceptual provisions for rurban landscapes assessment, prediction and regulation of changes. To achieve this objective, we have formulated the hypothesis of the research that includes seven hypothetical statements. The concept provisions of characterization, assessment, and regulation of changes of the rurban landscapes with examples of their application are developed in the section "Results and discussion". The research revealed the peculiarities of Lithuania in the study area and demonstrated the need to assess the local specifics of the rurban landscapes research from the early stage.

Key words: *rurban (rural – urban) landscapes, urbanization, historic types of rural landscape, visual characterization, ecoaesthetics.*

Anotacija

Analizuojami kaimo ir miesto sąveikos teritorijose besiformuojantys kraštovaizdžiai darnios teritorijų plėtros kontekste. Tyrimu siekiama suformuluoti ir išplėtoti kaimo ir miesto sąveikos teritorijose besiformuojančių kraštovaizdžių vertinimo ir kaitos reguliavimo koncepcines nuostatas. Siekiant šio tikslo, buvo suformuluota tyrimo hipotezė, apimanti septynis hipotetinius teiginius. Skyriuje „Rezultatai ir diskusija“ pateiktos kaimo ir miesto sąveikos teritorijose besiformuojančių kraštovaizdžių vertinimo ir kaitos reguliavimo koncepcinės nuostatos su jų pritaikymo pavyzdžiais. Tyrimas atskleidė Lietuvos ypatumus nagrinėtoje srityje ir parodė būtinybę kaimo ir miesto sąveikos teritorijose besiformuojančių kraštovaizdžių tyrimuose nuo pat pradinių etapų įvertinti vietos specifiką.

Reikšminiai žodžiai: *kaimo ir miesto sąsajų kraštovaizdžiai, urbanizacija, istoriniai kaimo kraštovaizdžio tipai, vizualinis apibūdinimas, ekoestetika.*

Introduction

Landscape variety, structure and composition may change dramatically over time. Over the last hundred years the intensive urbanization has led to the development of the areas of rural-urban interface: the areas surrounding most large cities and even moderate settlements have been radically transformed. Urban sprawl causes changes of both urban and rural landscapes. The landscapes emerging in the areas affected by rural and urban interface can be characterized as undefined structures, dynamic and constantly changing areas, which are often described as a transit zone between the expanding periphery of the city and nearby rural environment (Dutta 2012). The traditional development of landscapes takes on a new direction and a new *rurban* (rural-urban) landscape type emerges. According to W. Berentsen et al. (2000) “rurban areas are defined as places where there are many people who live urban lifestyles (including commuting to urban or suburban areas), but in a setting that otherwise appears rather rural (e.g., much of such an area may still be dominated by field and forest).” E. Wanemtpen (2009) notes as well that rurban areas spatially „materialise in a fragmented and dispersed way, creating diffuse heterogeneous tissue that is often neither urban nor rural but simultaneously both“. However, it is very important to note that such rurban areas have a rural history of land use largely influenced by agricultural politics (Palang et al. 2011) and this circumstance together with distinctive urban expansion patterns, geographical conditions etc. reflect local peculiarities of rural-urban interface. We argue that the research of these local peculiarities or rural-urban interface should constitute an important part of the rurban studies field.

Aim of the research: to formulate and develop concept provisions of rural landscapes characterization, assessment, and regulation of changes and to demonstrate local Lithuanian peculiarities in this context.

Methods of the research

The research was based on the complex methodology. The study contains both the features of analysis and synthesis. The methods applied in the research include:

The analysis of foreign and Lithuanian literature on the subjects of rural-urban interface, urban development, rural landscapes, landscape classification and valuation, aesthetics and ecology.

Formulation of hypothetical and concept statements based on *analysis, synthesis, comparison, generalization, and conclusions*. The vast body of research articles, reports and case studies were reviewed in order to formulate the concept statements on characterization, assessment, and regulation of changes of rural landscapes demonstrating some Lithuanian peculiarities.

The previous research experience (Brinkytė et al., 2013; Zaleskienė and Gražulevičiūtė-Vileniškė, 2013), *the preliminary observations on site, the analysis of maps and aerial photographs* were also useful elaborating the concept statements.

The methodologies of *visual landscape characterization* and *ecoaesthetic assessment* by M. Tveit et al. (2006), A. Ode et al. (2008) and M. Jankevica (2012) were also used in the research.

Hypothesis of the research

Hypothesis of the research. Main hypothetical statements deriving from the analysis of literature and documents, previous research (Brinkytė et al., 2013; Zaleskienė and Gražulevičiūtė-Vileniškė, 2013), and observations on sites are presented below:

1. *Research approach.* Comprehensive approach to rural landscapes, as relatively unknown and little researched landscapes, is needed.

2. *General characterization.* General characterization of rural landscapes must include their main development trends and general features; the key terms for describing them can be developed.

3. *Local peculiarities.* Rural landscapes in different regions and countries have their peculiarities determined by the character of landscape, climate, and history of the place, socioeconomic situation, cultural character and traditions, trends of urban development etc. These peculiarities must be taken into account in the rural studies from the early stage of the research.

4. *Importance of the relicts of historic rural landscape types.* Historic types of rural landscapes constitute an important and always less acknowledged part determining the local peculiarities of rural landscapes and can determine their identity.

5. *Classification.* Classifications of rural landscapes among other things must take into account the local landscape and classification tradition, existing land use typology, historic rural landscape types etc.;

6. *Assessment.* Assessment techniques applied to rural landscapes should consider both morphological and visual aspects and ecological aspects. Assessment techniques should be flexible in order to analyze and predict landscape changes and to adapt to local peculiarities.

7. *Regulation of changes and sustainable development.* Approaches towards regulation of changes of rural landscapes are essential. The regulation of changes must integrate sustainable functions, environmental sustainability and landscape aesthetics.

Results and discussion

Below we present the elaborated hypothesis in the form of concept statements regarding characterization, assessment, and regulation of changes of rural landscapes; elaboration of these statements reflects some local Lithuanian peculiarities as well.

1. *Research approach.* Urban expansion and penetration of urban forms and lifestyles into rural areas cause the formation of new types of landscapes (figure 1). These rural landscapes possessing a variety of new ecological, aesthetic, and functional features raise new challenges of landscape understanding, definition, analysis, and policy making. Even if these rural landscapes constitute our everyday working and living environment, they are *relatively unexplored and virtually unknown* for general society and even to a large part of experts. Thus the emerging variety of rural landscapes requires *comprehensive* approach, which encompasses all the stages from the first grasp (understanding) to definition, detailed analysis, setting the landscapes into physical and social context (comparison with other landscapes, understanding the society’s views towards these landscapes) to the policy making and development strategies. The analysis of such landscapes must be *interdisciplinary* as well, as the functional, ecological, aesthetic, historical, social, economic and other interrelated issues must be analyzed.

2. *General characterization.* According to G. Adell (1999), the prevailing morphological and functional approach to rural areas is based on the analysis of features such as density, morphology and land uses changing in an efferent pattern from the urbanized towards agricultural



A.
Major urban infrastructure Intensive agriculture Utility installations
Tourist and recreational uses Services facilities Suburban housing
Retail and commercial uses Green areas



B.
Abandoned agricultural lots Suburban housing Shed based agriculture
Utility installations Green areas

Fig. 1. Rural landscapes with multiple visible and hidden uses
(Poland - A, Lithuania - B)

and natural areas. In this case the object of research is the *rural-urban continuum* (figure 1). However, the pace at which these new landscapes had emerged and are constantly changing calls for the approaches addressing the temporal dimension: seeing the rural areas as *space-time continuum* (figure 2). For example, according to F. Marshall et al. (2009), the rural-urban interface can be defined as a *place, concept or process* and the recognition of the dynamism inherent in rural spaces is evident in the use of the terms, such as “space”, “zone” or “interface”. M. Antrop (2000) notes that landscape should be considered as *holistic, relativistic* and *dynamic*. Considering these approaches, we had distinguished the following features of the rural areas (Brinkytė et al. 2013): *remnant* (landscapes transformed by urbanization

still retaining historic dimension, landscape memory, and time depth), *dynamic* (the transitional character and the relevance of the dimension of time), *complex* (heterogeneous mix or rural and urban features, landscape fragmentation, emerging new landscape types), *emergent* (rapid change of landscape quality) *contested* (conflicts between rural and urban uses, lifestyles, different aesthetics), *interdependent* (links to and dependence from the urban area).



Fig. 2. Transformation of the rural space at the fringe of Kaunas city (Lithuania): traditional rural landscapes (A) were suddenly transformed by the advent of industrial agriculture, and in turn are altered again by the urban expansion (B, C) (Maps4u..., 2012; Maps..., 2013)

3. *Local peculiarities.* Local peculiarities of rural landscapes can be determined by many issues, besides of geographical peculiarities these issues among others are: the size of cities, character and scale of urban expansion and influence and the characteristics of rural landscape

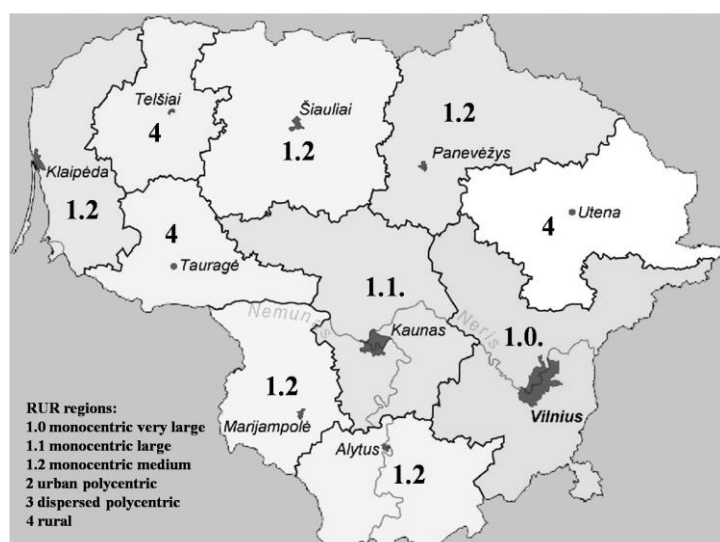


Fig. 3. RUR delineation and morphology classification for Lithuania (Nilsson et al., 2013)

(including historical development and its outcomes). For example, Lithuanian geographical situation and landscape with characteristic flatlands and river valleys certainly influenced and influences urban development and expansion and the character of rural landscape. Moreover, unlike many European countries, consistent and successive landscape evolution was not characteristic for Lithuanian landscape. Historical development of Lithuanian landscape is closely related to the political and social changes and land planning activities in the course of time. Uneven Lithuanian rural landscape formation had left the historical relics of the rural environment of different

qualities and identity (Bučas 2001), this, in fact, affects the character of Lithuanian rural areas and has the potential that could be exploited in their sustainable development. Urban expansion in Lithuania also has its own peculiarities – the major urban expansion in Lithuania took place during the Soviet period and it was rather compact and centrally planned; meanwhile, after the restoration of the independence, the urban expansion trend has radically shifted: now the major trend of urban

expansion is rather fragmented point expansion of low rise residential development into natural and rural areas stimulated by the real estate market and land speculation (Bardauskienė and Pakalnis 2012). Such trends and their shifts also affect the character and sustainability of rural areas. Lithuanian rural regions (RUR = the urban area + peri-urban area + rural hinterland) distinguished by K. Nilsson et al. (2013) (figure 3) also demonstrate the peculiarities of rural-urban interface in Lithuania.

4. *Importance of the relicts of historic rural landscape types.* The importance of the relicts of historic rural landscapes in the development of the areas of rural-urban interface can be demonstrated using the example of Lithuania. The character of contemporary country's landscape was largely determined by the anthropogenic processes related to agricultural development (Pašakarnis and Malienė 2010), thus the importance of historic rural landscape types in the development of contemporary rural landscapes in Lithuania cannot be underestimated. The following historical types of country's rural landscape can be distinguished: *ikivalakinis* (landscape formed before the land reform of the 16th century, mainly natural with primitive settlements), *valakinis* (landscape formed after the land reform of the 16th century, acquired more geometrized composition), *vienkieminis* (landscape of the inter-war period, dispersed, based on individual homesteads) and *kolūkinis* (landscape of the Soviet period of large scale agricultural lots, concentrated settlements and production complexes) (Bučas 2001). Each historic landscape type had a more or less positive and negative elements affecting human psychology and influenced the aesthetic perception of the territory. Moreover, these historical rural landscape relicts influences today's landscape character and identity in the areas of rural urban interface and offer valuable knowledge for more sustainable planning and management for rural landscapes (Antrop 2005).

5. *Classification.* There are many ways to classify different types of landscapes in the zones of rural urban interface, which we had discussed in our previous research (Zaleskienė and Gražulevičiūtė–Vileniškė 2013); however, the classification of rural landscapes may meaningfully encompass local peculiarities as well. These peculiarities can be integrated into more general classifications. For example, classification of Lithuanian rural landscapes can integrate not only the degree of influence of urbanization on the rural and natural areas (*rural or natural landscape with slight manifestations of features of urban environment, rural landscape with clear features of urban environment, landscape where the features of rural and urban environment are equally present, urban landscape with clear features of rural environment, urban landscape with slight manifestations of rural environment* (Zaleskienė and Gražulevičiūtė–Vileniškė 2013)), but also 1) general Lithuanian landscape classification (Lietuvos... 2004) (*natural, rural urban*); 2) Lithuanian landscape morphotypes (*marshy, wooded, wooded – agrarian, wooded – slightly urbanized, agrarian, agrarian – slightly urbanized, agrarian – urbanized, and urbanized* (Kavaliauskas 2011); 3) legally determined categories of land use, 4) types of historic rural landscapes.

6. *Assessment.* Characteristics of rural landscapes imply that assessment techniques applicable to the landscapes in the areas of rural urban interface should: 1) be flexible enough in order to apply them to a variety of types of these landscapes encompassing various features of rural, natural and urban landscapes and ranging from rural or natural landscape with slight manifestations of features of urban environment to urban landscape with slight manifestations of rural environment; 2) should address both morphological, heritage, aesthetic features and ecological aspects; 3) should address not only the rural-urban continuum but also the space-time continuum, in other words, they should provide the possibility to evaluate the changes of the rural landscapes. In this article we present an example of the methodology for the ecoaesthetic valuation for rural landscapes created based on M. Tveit et al. (2006), A. Ode et al. (2008) and M. Jankevica (2012) (table 1). In the table 2 we demonstrate the possibility to apply this methodology for the assessment of Lithuanian rural landscapes with the relicts of *vienkieminis* historic landscape type under the influence of urbanization. In the table we show the three directions of change (1) renaturalization of abandoned agricultural land, decline of buildings, 2) intensive processes of urbanization, features of

vienkieminiis rural landscape period are adapted to new functions, erased or abandoned and left to decline, 2) intensive agricultural use of land, reconstruction of existing buildings, construction of new necessary buildings and use for agricultural purposes) and provide assessments for them.

Table 1. Ecoaesthetic valuation methodology for rural landscapes based on M. Tveit et al. (2006), A. Ode et al. (2008) and M. Jankevica (2012)

Concept and indicators		Characterization
1	2	
Visual character, aesthetics	Complexity	
	Distribution of landscape attributes	- Richness of landscape elements (1-4) (1-low; 2-moderate; 3-average; 4-high) - Diversity of land cover (1-4) (1-low; 2-moderate; 3-average; 4-high)
	Spatial organization of landscape attributes	- Edge density (1-4) (1-low; 2-moderate; 3-average; 4-high) - Heterogeneity (1-4) (1-low; 2-moderate; 3-average; 4-high) - Aggregation of land cover/patches (1-4) (1-low; 2-moderate; 3-average; 4-high)
	Variation and contrast between landscape elements	- Contrast (1-4) (1-low; 2-moderate; 3-average; 4-high) - Shape variation (1-4) (1-low; 2-moderate; 3-average; 4-high) - Size variation (1-4) (1-low; 2-moderate; 3-average; 4-high)
	Coherence	
	Spatial arrangement of vegetation	- Correspondence with natural conditions (1-4) (1-low; 2-moderate; 3-average; 4-high) - Fragmentation (1-4) (1-low; 2-moderate; 3-average; 4-high) - Repetition of pattern across the landscape (1-4) (1-low; 2-moderate; 3-average; 4-high)
	Spatial arrangement of buildings and structures	- Correspondence of building arrangement with natural conditions (1-4) (1-low; 2-moderate; 3-average; 4-high) - Correspondence of building arrangement with landscape type (1-4) (1-low; 2-moderate; 3-average; 4-high)
	Correspondence of area with particular landscape type	- Correspondence of area with particular landscape type (1-4) (1-low; 2-moderate; 3-average; 4-high)
	Disturbance	
	Presence of disturbing / disturbed elements	- Presence of landscape elements classified as disturbing (1-4) (1-absent; 2-moderate; 3-average; 4-high)
	Visual impact of disturbing elements	- Area visually affected by disturbance (1-4) (1-absent; 2-moderate; 3-average; 4-large)
	Stewardship	
	Level of management for vegetation	- Level of abandonment (1-4) (1-absent; 2-moderate; 3-average; 4-high) - Presence of weed (1-4) (1-absent; 2-moderate; 3-average; 4-high) - Management type (1-4) (1-no maintenance; 2-poorly maintained; 3-partly maintained; 4-highly maintained) - Management frequency (1-4) (1-no management; 2-random; 3-satisfactory; 4-systematic)
	Status and conditions of man-made structures in the landscape	- Condition / maintenance of structures such as fences, buildings (1-4) (1-no maintenance; 2-poorly maintained; 3-partly maintained; 4-highly maintained)
	Imageability	
	Spectacular, unique and iconic elements	- Density of spectacular, unique or iconic built features (1-4) (1-absent; 2-moderate; 3-average; 4-high) - Density of landmarks (1-4) (1-absent; 2-moderate; 3-average; 4-high) - Proportion of water (1-4) (1-absent; 2-moderate; 3-average; 4-high) - Density of historical elements (1-4) (1-absent; 2-moderate; 3-average; 4-high)
	Viewpoints	- Density of viewpoints (1-4) (1-low; 2-moderate; 3-average; 4-high)
	Visual scale	
	Open area	- Proportion of open land (1-4) (1-absent; 2-moderate; 3-average; 4-high) - Viewshed size (1-4) (1-small; 2-moderate; 3-average; 4-large) - Viewshed shape (1-3) (1-patchy open area; 2-split open area; 3-large open area) - Depth / breadth of view (1-3) (1-short; 2-medium; 3-long)
	Obstruction of the view	- Density of obstructing elements (1-4) (1-low; 2-moderate; 3-average; 4-high) - Degree of visual penetration of vegetation (1-4) (1-blocked; 2-dense; 3-semi-open; 4-open)
	Naturalness	
	Naturalness of vegetation	- Proportion of natural vegetation (1-4) (1-low; 2-moderate; 3-average; 4-high) - Level of succession (the observed process of change in the species structure of an ecological community over time) (1-4) (1- no succession; 2- primary succession; 3- intermediate succession; 4- climax) - Shape of edges (1-3) (1-geometrical; 2-intermediate; 3-complex)
	Pattern in the landscape, as perceived as natural or not	- Landscape visual fragmentation (1-4) (1-low; 2-moderate; 3-average; 4-high)
	Water bodies with natural appearance	- Proportion of water in landscape (1-4) (1-absent; 2-moderate; 3-average; 4-high)

1 lentelės tęsinys

1		2	
Visual character, aesthetics	Historicity		
	Vegetation with continuity	- Proportion of landscape with continuity of land cover (1-4) (1-low; 2-moderate; 3-average; 4-high)	
		- Proportion of landscape with traditional land use (1-4) (1-absent; 2-moderate; 3-average; 4-high)	
	Organization of landscape attributes	- Traditional field shapes (1-4) (1-absent; 2-moderate; 3-average; 4-high)	
		- Traditional spatial arrangement of vegetation (1-4) (1-absent; 2-moderate; 3-average; 4-high)	
	Landscape elements	- Density of cultural elements (1-4) (1-absent; 2-moderate; 3-average; 4-high)	
		- Cultural significance of landscape elements (1-4) (1-low; 2-moderate; 3-average; 4-high)	
		- Presence of time layers (1-4) (1-low; 2-moderate; 3-average; 4-high)	
		- Presence of traditional linear shapes (1-4) (1-absent; 2-moderate; 3-average; 4-high)	
	Ephemera		
Season-bound activities	- Presence of animals (1-4) (1-absent; 2-moderate; 3-average; 4-high)		
	- Presence of cyclical farming activities (1-4) (1-absent; 2-moderate; 3-average; 4-high)		
Landscape attributes with seasonal change	- Seasonal variation in natural vegetation (1-4) (1-low; 2-moderate; 3-average; 4-high)		
	- Seasonal variation on agricultural land (1-4) (1-low; 2-moderate; 3-average; 4-high)		
Landscape attributes with weather characteristics	- Presence in landscape of water or other expressive attributes with weather characteristics (1-4) (1-absent; 2-moderate; 3-average; 4-high)		
Ecology	Biodiversity (<i>rich biodiversity characteristic for geographic area under analysis, vegetation health</i>)		(1-4) (1-low; 2-moderate; 3-average; 4-high)
	Accordance with landscape type (<i>ecological situation corresponds to particular landscape type</i>)		(1-4) (1-low; 2-moderate; 3-average; 4-high)
	Predominance of native species (<i>ecosystems dominated by native species</i>)		(1-4) (1-low; 2-moderate; 3-average; 4-high)
	Predominance of natural elements (<i>unaltered and undisturbed natural elements prevail</i>)		(1-4) (1-low; 2-moderate; 3-average; 4-high)
	Carelessness (<i>landscapes in succession</i>)		(1-4) (1-low; 2-moderate; 3-average; 4-high)
	Presence of unaffected nature processes (<i>wilderness, natural landscape development without significant human intervention prevails</i>)		(1-4) (1-low; 2-moderate; 3-average; 4-high)

Table 2. Main directions of change of the relicts of *vienkieminis* rural landscape in the areas of rural-urban interface and their assessment using approaches by M. Tveit et al (2006), A. Ode et al (2008) and M. Jankevica (2012)

Approach	Concept and indicators	Preliminary characterization	Main directions of change of the relicts of the <i>Vienkieminis</i> rural landscape in the areas of rural-urban interface		
			Renaturalization	Urbanization	Agricultural use
1	2	3	4	5	6
Visual character, aesthetics	Complexity				
	Distribution of landscape attributes	- Richness of landscape elements (1-4) (1-low; 2-moderate; 3-average; 4-high)	2	3	3
		- Diversity of land cover (1-4) (1-low; 2-moderate; 3-average; 4-high)	1-2	2	3
	Spatial organization of landscape attributes	- Edge density (1-4) (1-low; 2-moderate; 3-average; 4-high)	1	3	2
		- Heterogeneity (1-4) (1-low; 2-moderate; 3-average; 4-high)	2	3	2
		- Aggregation of land cover/patches (1-4) (1-low; 2-moderate; 3-average; 4-high)	2	3	3
	Variation and contrast between landscape elements	- Contrast (1-4) (1-low; 2-moderate; 3-average; 4-high)	2	3-4	3
		- Shape variation (1-4) (1-low; 2-moderate; 3-average; 4-high)	1-2	3	2
		- Size variation (1-4) (1-low; 2-moderate; 3-average; 4-high)	1-2	2-3	2
	Coherence				
	Spatial arrangement of vegetation [1]	- Correspondence with natural conditions (1-4) (1-low; 2-moderate; 3-average; 4-high)	3	2	2
		- Fragmentation (1-4) (1-low; 2-moderate; 3-average; 4-high)	1	3-4	2
		- Repetition of pattern across the landscape (1-4) (1-low; 2-moderate; 3-average; 4-high)	1-2	3	2
	Spatial arrangement of buildings and structures	- Correspondence of building arrangement with natural conditions (1-4) (1-low; 2-moderate; 3-average; 4-high)	-	2	3
- Correspondence of building arrangement with landscape type (1-4) (1-low; 2-moderate; 3-average; 4-high)		-	2	3-4	
Correspondence of area with particular landscape type	- Correspondence of area with particular landscape type (1-4) (1-low; 2-moderate; 3-average; 4-high)	1	2-3	3-4	

2 lentelės tęsinys

1	2	3	4	5	6
Visual character, aesthetics	Disturbance				
	Presence of disturbing elements	- Presence of landscape elements classified as disturbing (1-4) (1-absent; 2-moderate; 3-average; 4-high)	3	3	2
	Visual impact of disturbing elements	- Area visually affected by disturbance (1-4) (1-absent; 2-moderate; 3-average; 4-large)	3	3-4	1
	Stewardship				
	Level of management for vegetation	- Level of abandonment (1-4) (1-absent; 2-moderate; 3-average; 4-high)	3	2-3	1
		- Presence of weed (1-4) (1-absent; 2-moderate; 3-average; 4-high)	4	1-2	1
		- Management type (1-4) (1-no maintenance; 2-poorly maintained; 3-partly maintained; 4-highly maintained)	1	3	4
		- Management frequency (1-4) (1-no management; 2-random; 3-satisfactory; 4-systematic)	1	2-3	4
	Status and conditions of man-made structures in the landscape	- Condition / maintenance of structures such as fences, buildings (1-4) (1-no maintenance; 2-poorly maintained; 3-partly maintained; 4-highly maintained)	1	3-4	3-4
	Imageability				
	Spectacular, unique and iconic elements	- Density of spectacular, unique or iconic built features (1-4) (1-absent; 2-moderate; 3-average; 4-high)	1-2	2	2-3
		- Density of landmarks (1-4) (1-absent; 2-moderate; 3-average; 4-high)	1-2	2-3	2
		- Proportion of water (1-4) (1-absent; 2-moderate; 3-average; 4-high)	-	-	-
		- Density of historical elements (1-4) (1-absent; 2-moderate; 3-average; 4-high)	1-2	1-2	2
	Viewpoints	- Density of viewpoints (1-4) (1-low; 2-moderate; 3-average; 4-high)	2	3-4	2
	Visual scale				
	Open area	- Proportion of open land (1-4) (1-absent; 2-moderate; 3-average; 4-high)	3-4	2	4
		- Viewshed size (1-4) (1-small; 2-moderate; 3-average; 4-large)	3-4	1	3-4
		- Viewshed shape (1-3) (1-patchy open area; 2-split open area; 3-large open area)	2	1	3
		- Depth / breadth of view (1-3) (1-short; 2-medium; 3-long)	3	1	3
	Obstruction of the view	- Density of obstructing elements (1-4) (1-low; 2-moderate; 3-average; 4-high)	1-2	3-4	1-2
		- Degree of visual penetration of vegetation (1-4) (1-blocked; 2-dense; 3-semi-open; 4-open)	3	3	4
	Naturalness				
	Naturalness of vegetation	- Proportion of natural vegetation (1-4) (1-low; 2-moderate; 3-average; 4-high)	4	1-2	2
		- Level of succession (the observed process of change in the species structure of an ecological community over time) (1-4) (1- no succession; 2- primary succession; 3- intermediate succession; 4- climax)	3-4	2	1
		- Shape of edges (1-3) (1-geometrical; 2-intermediate; 3-complex)	2-3	1-2	1
Pattern in the landscape, as perceived as natural or not	- Landscape visual fragmentation (1-4) (1-low; 2-moderate; 3-average; 4-high)	3	3-4	1-2	
Water bodies with natural appearance	- Proportion of water in landscape (1-4) (1-absent; 2-moderate; 3-average; 4-high)	-	-	-	

2 lentelės tęsinys

1	2	3	4	5	6	
Visual character, aesthetics	Historicity					
	Vegetation with continuity	- Proportion of landscape with continuity of land cover (1-4) (1-low; 2-moderate; 3-average; 4-high)		1	1	1-2
		- Proportion of landscape with traditional land use (1-4) (1-absent; 2-moderate; 3-average; 4-high)		1	1	3-4
	Organization of landscape attributes	- Traditional field shapes (1-4) (1-absent; 2-moderate; 3-average; 4-high)		1	1	1-2
		- Traditional spatial arrangement of vegetation (1-4) (1-absent; 2-moderate; 3-average; 4-high)		1	1	1-2
	Landscape elements	- Density of cultural elements (1-4) (1-absent; 2-moderate; 3-average; 4-high)		1-2	2-3	2
		- Cultural significance of landscape elements (1-4) (1-low; 2-moderate; 3-average; 4-high)		1-2	2-3	2-3
		- Presence of time layers (1-4) (1-low; 2-moderate; 3-average; 4-high)		2	2	3-4
		- Presence of traditional linear shapes (1-4) (1-absent; 2-moderate; 3-average; 4-high)		1-2	1	2
	Ephemera					
	Season-bound activities	- Presence of animals (1-4) (1-absent; 2-moderate; 3-average; 4-high)		1	1	4
		- Presence of cyclical farming activities (1-4) (1-absent; 2-moderate; 3-average; 4-high)		1	1	4
	Landscape attributes with seasonal change	- Seasonal variation in natural vegetation (1-4) (1-low; 2-moderate; 3-average; 4-high)		3	2	2
- Seasonal variation on agricultural land (1-4) (1-low; 2-moderate; 3-average; 4-high)		1	1	4		
Landscape attributes with weather characteristics	- Presence in landscape of water or other expressive attributes with weather characteristics (1-4) (1-absent; 2-moderate; 3-average; 4-high)		-	-	-	
Ecology	Biodiversity (<i>rich biodiversity characteristic for geographic area under analysis, vegetation health</i>) (1-4) (1-low; 2-moderate; 3-average; 4-high)		2-3	2	2	
	Accordance with landscape type (<i>ecological situation corresponds to particular landscape type</i>) (1-4) (1-low; 2-moderate; 3-average; 4-high)		1-2	2	3-4	
	Predominance of native species (<i>ecosystems dominated by native species</i>) (1-4) (1-low; 2-moderate; 3-average; 4-high)		3-4	2	2	
	Predominance of natural elements (<i>unaltered and undisturbed natural elements prevail</i>) (1-4) (1-low; 2-moderate; 3-average; 4-high)		3	2	2	
	Carelessness (<i>landscapes in succession</i>) (1-4) (1-low; 2-moderate; 3-average; 4-high)		4	2	1-2	
	Presence of unaffected nature processes (<i>wilderness, natural landscape development without significant human intervention prevails</i>) (1-4) (1-low; 2-moderate; 3-average; 4-high)		3	1-2	1-2	
- difficult to determine characteristics						

7. *Regulation of changes and sustainable development.* Regulation of changes in the areas or rural-urban interface guiding them towards the direction of more sustainable development is of crucial importance for these dynamic areas. The regulation of changes can be implemented effectively by elaborating the scenarios of development of the relicts of rural landscape in the areas of rural-urban interface under different conditions of implementation. These scenarios may include the image of the area, functions, plan and spatial structure, heritage preservation requirements, desirable ecological conditions etc. In order to evaluate the alternative scenarios for the same area, the analysis of the strengths, weaknesses, opportunities, and threats could be carried out. Aesthetic development trends for these scenarios can also be determined, for example using the aesthetic perceptual categories under sustainable landscape conditions distinguished by W. Nohl (2001). For the assessment of proposed alternative development scenarios above presented ecoaesthetic valuation methodology for rural landscapes based on M. Tveit et al. (2006), A. Ode et al. (2008) and M. Jankevica (2012) can also be applied and the assessment results can be compared for different scenarios and with the present condition of the territory.

Conclusions

1. The landscapes emerging in the areas or rural-urban interface constitute our everyday living and working environment; however, these new types of landscapes still are little researched and can be referred to as relatively unknown landscapes. Moreover, each country or region has its own geographical peculiarities, specific rural landscapes and urban development trends, which condition the local peculiarities or rural areas. In the article we argue that, in order to avoid losing the local identities of landscapes around the world, these local peculiarities should constitute an important part of rural studies.

Table 3. Summary of the concept provisions of rural landscapes characterization, assessment, and regulation of changes

Rurban landscapes	
<i>Research approach</i>	Comprehensive, interdisciplinary
<i>General characterization</i>	Rural-urban continuum, time-space continuum Remnant, dynamic, complex, emergent, contested, interdependent
<i>Local peculiarities</i>	Geographic peculiarities, size of cities, character, pace and scale of urban expansion, characteristics of rural landscape
<i>Importance of the relicts of historic rural landscape types</i>	Important factor determining the identity and value of rurban landscapes
<i>Classification</i>	General, conventional classifications Integration of local aspects into classifications: local landscape morphotypes, landscape classification and land use classification from local legislations, types of historic rural landscape etc.
<i>Assessment</i>	Flexible methodologies Address both morphological, heritage, aesthetic features and ecological aspects Provide the possibility to evaluate the changes of the rurban landscapes
<i>Regulation of changes and sustainable development</i>	Development of scenarios under different conditions of implementation Analysis of the strengths, weaknesses, opportunities, and threats of scenarios Determining the aesthetic development trends for these scenarios Application of assessment methodologies for comparison of different scenarios and the present condition.

2. Hypothetical statements regarding the characterization, assessment, and regulation of changes of rural landscape formulated in the research encompass the selection of research strategies, general description of rural landscapes, the significance of local characteristics and historical relics of the rural environment for these landscapes, the classification and valuation of rural landscapes, the prediction of changes and possibilities of sustainable development of rural landscapes.

3. The concept provisions of rural landscapes characterization, assessment, and regulation of changes (Table 3) include the elaboration of hypothetical statements based on the analysis of foreign and Lithuanian literature, maps and documents, observations on site and our earlier research. Part of the concept provisions are illustrated with Lithuanian examples in order to stress the local peculiarities in the analysis of rural landscapes: we discuss Lithuanian peculiarities of rural-urban interface and the importance of the relicts of historic rural landscapes in it and present the guidelines for classification of Lithuanian rural landscapes. The methodology of ecoaesthetic assessment of rural landscapes is also presented in the research as a useful tool for the analysis and assessment of changes in the areas of rural urban interface; some suggestions for the regulation of changes in these areas are also presented.

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Kaimo ir miesto sąsajų kraštovaizdžiai: apibūdinimas, vertinimas, kaitos reguliavimas

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Santrauka

Miesto ir kaimo aplinkos sąveikos teritorijose formuojasi nauji kraštovaizdžiai, tampantys kasdiene mūsų gyvenamąja ir darbo aplinka. Visgi iki šiol šie kraštovaizdžiai yra menkai tyrinėjami mokslininkų ir mažai pažįstami

visuomenės ir todėl, nepaisant jų kasdieniškumo, gali būti įvardijami nepakankamai suprastais ir ištyrinėtais. Be to, kiekviena valstybė ar regionas turi savo geografines ypatybes, išskirtinius kaimo kraštovaizdžius su sava istorija ir pasižymi tam tikromis miestų plėtros ypatybėmis. Tai lemia vietinius kraštovaizdžių, besiformuojančių miesto ir kaimo sąveikos teritorijose, ypatumus. Šių ypatumų analizė taip pat turėtų užimti svarbią vietą tokio tipo kraštovaizdžių tyrimuose.

Straipsnyje buvo suformuluota miesto ir kaimo sąveikos teritorijose besiformuojančių kraštovaizdžių apibūdinimo, tyrimų ir pokyčių reguliavimo hipotezė, apimanti tyrimų strategijos pasirinkimą, tokių kraštovaizdžių charakterizavimą, vietinių ypatumų ir istorinių kaimo aplinkos relikvų reikšmę, šių kraštovaizdžių klasifikacijos ypatumus ir vertinimą bei pokyčių reguliavimą, siekiant darnesnio miesto ir kaimo sąsajų kraštovaizdžių vystymosi.

Miesto ir kaimo sąveikos teritorijose besiformuojančių kraštovaizdžių apibūdinimo, tyrimų ir pokyčių reguliavimo koncepcija buvo sudaryta remiantis Lietuvos ir užsienio literatūra, dokumentų ir žemėlapių analize, tyrimais vietose ir ankstesnių tyrimų patirtimi išplėtojus hipotetinius teiginius. Dalis koncepcijos teiginių yra iliustruoti Lietuvos pavyzdžiu, taip siekiant parodyti vietinių ypatumų svarbą tyrinėjant šio tipo kraštovaizdžius: aptariami miesto ir kaimo sąveikos ypatumai Lietuvoje, istorinių kaimo kraštovaizdžio tipų relikvų reikšmė šioje sąveikoje, pateikiamos gairės Lietuvos kaimo ir miesto sąsajų kraštovaizdžių klasifikacijai. Straipsnyje taip pat pateikiama miesto ir kaimo sąveikos teritorijose besiformuojančių kraštovaizdžių ekoestetinio vertinimo metodika, kuri gali būti naudojama šiems kraštovaizdžiams ir jų pokyčiams vertinti, taip pat pateikiami siūlymai pokyčiams reguliuoti šiose teritorijose.