Changes of Compositional Features of Church Villages in Rural Landscape

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Church villages form a significant part in the urban framework of Lithuania and they are inseparable components of the cultural landscape. Beginning with the end of the 18th century church villages had fully functioned together with towns and village settlements of the country. Their functional development and formation of the urban structure are closely related with the expansion of Christianity in Lithuania. Formation of compositional links between church villages and the rural landscape was mainly influenced by their urban structure determined by the canons of the Catholic Church. The network of church villages had determined the cultural distinctiveness of Lithuanian rural landscape till the middle of the 20th century. Considering that the preservation of identity and distinctiveness of Lithuanian countryside requires the analysis of church villages and their role in the country’s landscape, this article analyzes the changes in compositional features of church villages in the spatial structure of the rural landscapes and the factors determining these changes. In order to perceive deeper their compositional features of the spatial structure in the ethno-cultural landscape, assessment of the aesthetic potential of the their layout and spatial structure is also presented.

Keywords: church villages, rural landscape, panorama, layout, spatial structure.

1. Introduction

Church spires and abundant greenery of churchyards constituted the visual landmarks and the network of vertical elements carrying the spiritual and religious sense in Lithuanian rural landscape till the middle of the 20th century. Formation of compositional structures of church villages was mainly determined by the surrounding natural environment and the character of their urban structure (layout type, buildings, and green structures). Beginning with the middle of the 20th century traditional priority towards residential and religious functions in church villages changed with the growing interests of production and commerce. Large open spaces and engineering-industrial installations of collective farms were formed in the rural landscape. After Restoration of the Independence, Lithuanian rural landscape and its historical structures have been undergoing further visual changes.

This article aims to assess compositional features of church villages as important components of rural landscapes of the country and their changes.

To assess the significance of church villages in the visual structure of Lithuanian rural landscape, the following tasks have been carried out:

– analysis of the characteristic compositional features of church villages and their changes in a spatial structure of the rural landscape of the country;

– analysis of the factors determining the formation and development of church villages compositional structure;

– determination of aesthetic potential of the layout and spatial structure of church villages.

Comprehensive assessment of compositional features of church villages is possible only after the analysis of all of them existing in the present territory of Lithuania. 91 church villages are identified in the territories of Kaunas, Alytus, and Marijampolė regions: 39 - in Kaunas region, 24 - in Alytus region, and 28 - in Marijampolė region. Church villages analysis was accomplished in situ in the period between 2000 and 2008; 92% of them being in Kaunas region, 71% - in Alytus region, and 40% - in Marijampolė region (Fig.1). The pilot observation has been carried out in all church villages of Kaunas, Alytus, and Marijampolė regions.

Fig.1. Extent of the analysis of church villages in situ (based on the reports of the culturological analysis of church villages of 2000-2008)

2. Role of church villages in the visual structure of Lithuanian rural landscape up to the middle of the 20th century

Up to the middle of the 20th century the central parts of 45% of the analyzed church villages had significantly evolved and were similar to the centers of towns (Lietuvos kraštotvarka 2001-2005). Compositional links with the surrounding landscape of these church villages are similar to those of towns. For example, towers of churches and abundant churchyard greenery of church villages of Šilavotas, Gžai, Gudeliai, Kalviai, Lesčiai, Ūdrėja, and Apytalaukis constitute the landmarks in panoramas of the rural landscape (Fig.2). The radius of their visual influence zone may reach 4.5 km depending on the terrain character.

Around 40% of church villages do not constitute any expressive accents in the rural landscape (Lietuvos kraštotvarka ..., 2001-2005). Wooden or masonry churches of moderate height were built in Šventybrastis, Kulva, Panevėžiukas, Anciškis, Vosyliškis, and Alovė. Towers of churches are not visible through the abundant churchyard greenery.

Changes of Compositional Features of Church Villages in Rural Landscape
The compositional expression in the landscape of these settlements is strongly influenced by the character of the terrain. Features of the natural environment, such as character of the terrain, water bodies and forests often have an impact on the compositional expression in the landscape of church villages. Flat or hilly terrain can highlight or diminish their compositional features. In many cases the forested areas neutralize the settlement silhouette (Gegužinė, Gerdašiai, Braziūkai, Rudnia) (Fig.3).

Fig.2. Panorama of Šilavotas church village (Priena i district) (photograph by V. Karvelytė Balbierienė) 2007

Fig.3. Silhouette of Gegužinė church village (Kaišiadoriai district) in the forested area (photograph by V. Karvelytė Balbierienė, 2007)

Distinctive silhouettes of church villages had evolved in the river valleys. Churches were usually built in the expressive scenic environment in the period of Romanticism in the first half of the 20th century (Ugioniai, Apytalaukis, Pajevonys). In such cases the compositional expression of a church village was deliberately formed in the landscape (Fig.4).

Fig.4. Panorama of Ugonai church village (Raseiniai district) near the valley of the Dubysa River (photograph by V. Karvelytė Balbierienė, 2007)

Analysis of church village compositional features in the rural landscape has revealed that the links of the urban structure of these settlements with the features of the natural environment result in characteristic landscape panoramas. Analysis of the compositional features of these panoramas has demonstrated that church villages constituted distinctive elements in the rural landscape up to the middle of the 20th century and their compositional features reminded more of towns than village settlements.

After the analysis of compositional structure of church village silhouettes, two distinctive types of their silhouettes formed up to the middle of the 20th century are distinguished (Fig.5). Silhouette of type A is characteristic of church villages which had the status of town in the past and of the settlements with the developed radial layout. The terrain features had strongly influenced the compositional expression in the landscape of these settlements. Silhouette of type B is characteristic of church villages of the inter-war period and of other settlements with religious function. Churchyard greenery usually dominates smooth silhouette of these settlements. Church villages of this type enjoy either radial or linear layout (Fig.5). Church villages which started developing later in the inter-war period, also possess similar compositional features. For example, Sutkai, Pažėrai, Gudžiūnai, Pajieslys, Kučiūnai, Kazliškis have less developed layout structures and compositional features of their silhouettes are similar to the village settlements.
3. Role of church villages in the contemporary Lithuanian landscape

Beginning with the middle of the 20th century, the changes in a spatial structure and visual significance of church villages were determined by development of the engineering systems, new modes of agricultural production, and new quotidian and cultural needs of the increasing number of residents. In order to adapt the historical urban structure of traditional rural settlements to new functions, comprehensive researches on development of the layout and spatial structure and on the needs of services were carried out and the proposals for the further urban and functional development of these settlements were prepared (Pasiūlymų ruošimas Lietuvos TSR kaimo ..., 1969, 1970; Rekomendacijos dėl rajono išplanavimo ..., 1973; LTSR mažų miestų ..., 1975). These researches and proposals were aimed at:

- sustaining the scenic panoramas of settlements;
- creating the optimal links between residential and production zones;
- separating the residential zone from the intensive use roads.

Church villages were reconstructed into the settlements of collective farms. The visual role in the landscape, the extent of cultural heritage, and the proportion of extant characteristic compositional features strongly depended on the administartional type of settlements, i.e. central, satellite, and non-perspective. A great quantity of new anthropogeneous objects emerged in church villages which were attributed to the category of central settlements of collective farms. Meanwhile, church villages which were attributed to the group of non-perspective settlements retained the majority of their authentic features. To understand better the changes in church village of the Soviet period, characteristic types of changes in their silhouettes were distinguished (Fig.7).

Changes in compositional structures of church village silhouettes of type A are minimal. The panoramas of these settlements have retained the authentic traditional composition, which evolved up to the middle of the 20th century. Main landmarks in the silhouettes of these settlements still are church towers or abundant churchyard greenery, whereas 26% of the analyzed church villages have retained them.

Changes in compositional structure of the silhouettes of type B had partially altered the traditional ones of church villages. The silhouettes of 29% of the analyzed church villages of Kaunas, Alytus, and Marijampolė regions were complemented with new anthropogeneous elements contrasting with the structures of traditional architecture. Engineering installations, blocks of flats, buildings of public institutions became new visual accents and fractured traditional church villages silhouettes with their volumes and colours.
Church villages attributed to *type C* had undergone the major changes in compositional structures of the silhouette. 45% of them of Kaunas, Alytus, and Marijampolė regions lost their organic links with the surrounding landscape. Traditional silhouettes of these settlements are strongly altered by visually active unattractive forms of farming and production buildings and engineering equipment, which had emerged alongside church towers and churchyard greenery. New anthropogeneous accents do not fit into the traditional compositional structure of church villages and form chaotic silhouettes.

Analysis of the characteristic compositional features of church villages and their changes allows concluding that new anthropogeneous elements had mainly a negative influence on the composition of church village silhouettes. New objects of large volumes built in them and in their surrounding environment at the beginning of the middle of the 20th century fractured the historical compact built-up structure of these settlements. These changes affected the compositional links with the surrounding environment of approximately 60 – 74% of the analyzed church villages of Kaunas, Alytus, and Marijampolė regions. New anthropogeneous accents with the productive functions have emerged in the compositional structure of these settlements and have diminished the significance of the landmarks reflecting social (residential) and religious functions. Engineering installations and masonry buildings of large volumes built of silicate bricks currently dominate in historical church village silhouettes (Fig. 6).

![Fig.6](image)

**Fig. 6.** Volumes of the buildings of public and productive functions built in *Daryniškis* church village (Kašiadoriai district) in the second half of the 20th century transformed compositional expression in the landscape. New elements form the silhouette of a scattered structure (photograph by V. Karvelytė-Balbienė, 2009)

4. **Assessment of aesthetic potential of layout and spatial structure of church villages**

To assess objectively and to compare the compositional characteristics in the rural landscape of traditional urban structures of church villages formed up to the middle of the 20th century and the quality of changes in their urban structure reconstructed during the period of the Soviet occupation, it has been selected the theory of a complex architectural form developed by N. A. Salingaros (2005) based on the works of Christopher Alexander, on the models of informative visual perception and visual construction, and on the mathematical models. The criterion of the assessment of the complex architectural environment is perception of its structure as a whole and psychological and informative acceptability or non-acceptability. General model of the assessment of aesthetic potential of the layout and spatial structure of church villages is presented in Figure 8. Application of the above described methodology to the assessment of aesthetic potential of the layout and spatial structure of church villages is based on the quantity of visual information:

- the environment should provide sufficient quantity of information:
  - A certain detailed curvilinear zone of clear contrast must exist in the field of visual perception.
  - Flat structures can contribute to the perception of the contrast and the details of the environment only in those cases when they have a clearly expressed center or boundaries.

- the environment should not provide the overflow of information:
  - Visual information should be related to the clear compositional line (lines).
  - Symmetry and models (generalized typical models of structuring the information formed by culture and the collective subconsciousness are also related to the proper organization of the information) allow organizing even abundant visual information without overloading the spectator.

- in both cases:
  - Colour is an essential element of the visual environment: it does not only increase diversity of the environment but also allows grouping the elements in the environment.

Aesthetic potential of the layout and spatial structure of church villages is assessed using the methodology by N. A. Salingaros (2005) taking into account the layout type (radial, linear, steadying, irregular, mixed) and the character of its changes (extant (authentic), partially altered, reconstructed). The methodology, in addition to allowing comparison of aesthetic potential of different layout structures and their silhouettes (C), make it possible to evaluate visual-aesthetic characteristics of the separate elements of the layout and silhouette:
o degree of complexity, diversity, and information;
o harmony and symmetry (define compatibility
of the objects in the composition);
o interest of the structure
o disorder of the structure;
o general aesthetic potential of the structure.

**TYPES OF CHANGES IN THE URBAN STRUCTURE AND THE CHURCH VILLAGE ROLE IN THE LANDSCAPE BEGINNING WITH THE MIDDLE OF THE 20TH CENTURY**

<table>
<thead>
<tr>
<th>Types of Changes</th>
<th>Types of Layout Structure</th>
<th>Types of Silhouette Compositional Structures in the Landscape</th>
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</table>
| **26% of villages** | **Type A** | **Type A** - changes in compositional structure of church village as a non-perspective agricultural settlement:  
- dominant historical wooden architecture;  
- decaying homesteads and declining built-up structure,  
- church or greenery of churchyard dominate in the settlement. |
| with churches | **EXTANT HISTORICAL LAYOUT TYPE** | **Type A** - changes in compositional structure of church village as a non-perspective agricultural settlement:  
- dominant historical wooden architecture;  
- decaying homesteads and declining built-up structure,  
- church or greenery of churchyard dominate in the settlement. |
| attributed to the group of rural settlements after 1990 | **radial, linear, rectangular** | **Type A** - changes in compositional structure of church village as a non-perspective agricultural settlement:  
- dominant historical wooden architecture;  
- decaying homesteads and declining built-up structure,  
- church or greenery of churchyard dominate in the settlement. |
| **29% of villages** | **Type B** | **Type B** - changes in compositional structure of church village as a satellite agricultural settlement:  
- masonry buildings dominate in the new part of the settlement, wooden buildings still occupy the historical part, and agricultural centre extends near the settlement;  
- slightly declining historical homesteads;  
- group of residential buildings, agricultural centre, and church dominate in the settlement. |
| with churches | **SLIGHTLY ALTERED HISTORICAL LAYOUT TYPE** | **Type B** - changes in compositional structure of church village as a satellite agricultural settlement:  
- masonry buildings dominate in the new part of the settlement, wooden buildings still occupy the historical part, and agricultural centre extends near the settlement;  
- slightly declining historical homesteads;  
- group of residential buildings, agricultural centre, and church dominate in the settlement. |
| attributed to the group of rural settlements after 1990 | **radial, linear, rectangular** | **Type B** - changes in compositional structure of church village as a satellite agricultural settlement:  
- masonry buildings dominate in the new part of the settlement, wooden buildings still occupy the historical part, and agricultural centre extends near the settlement;  
- slightly declining historical homesteads;  
- group of residential buildings, agricultural centre, and church dominate in the settlement. |
| **45% of church villages. After 1990 the largest part (52 % of the whole list) attributed to the group of towns** | **Type C** | **Type C** - changes in compositional structure of church village as a central agricultural settlement:  
- one-storey or multi-storey buildings and engineering equipment of large volumes dominate in the composition of the settlement; historical architecture is almost lost;  
- settlement is densely built and lacks greenery;  
- administrative, commercial buildings, engineering equipment, and church form the accents in the settlement. |
| | **RECONSTRUCTED LAYOUT TYPE** | **Type C** - changes in compositional structure of church village as a central agricultural settlement:  
- one-storey or multi-storey buildings and engineering equipment of large volumes dominate in the composition of the settlement; historical architecture is almost lost;  
- settlement is densely built and lacks greenery;  
- administrative, commercial buildings, engineering equipment, and church form the accents in the settlement. |
| | **rectangular, mixed, irregular** | **Type C** - changes in compositional structure of church village as a central agricultural settlement:  
- one-storey or multi-storey buildings and engineering equipment of large volumes dominate in the composition of the settlement; historical architecture is almost lost;  
- settlement is densely built and lacks greenery;  
- administrative, commercial buildings, engineering equipment, and church form the accents in the settlement. |

Fig. 7. Scheme of the changes in the urban structure of church villages based on the analysis of the elements of the layout and of changes in the silhouette beginning with the middle of the 20th century

Assessment of aesthetic potential of the layout and spatial structure of church villages is based on the idea of the proper organization of the information, i.e. the field of visual observation should constitute an integral, hierarchical compositional-informative entity. This can be achieved by a proper scale of the parts of the whole composition (Fig. 9). Aesthetic potential of the layout and spatial structure of church villages has been assessed in two stages: aesthetic potential of the layout structure (for example, the radial plan) of church village is determined estimating the degrees of information (T) and harmony (H) of separate structural elements; while aesthetic potential of the silhouette structure of the same church village has been also assessed (Fig. 9).
MODEL OF ASSESSMENT OF AESTHETIC POTENTIAL OF THE LAYOUT AND SPATIAL STRUCTURE OF CHURCH VILLAGE

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Aesthetic potential of the layout structure of church village

\[ L = T \times H \]

- \( L \) - degree of interest, attractiveness (originality) of the layout structure;
- \( T \) - degree of information from 0 to 10;
- \( H \) - degree of harmony of the layout structure from 0 to 10.

\[ S = H_{\text{max}} - H \]

- \( S \) - degree of chaos (disorder) in the layout structure;
- \( H_{\text{max}} \) - optimal constant of harmony of the layout structure equals 10.

\[ C = T \times S \]

- \( C \) - aesthetic potential of the layout structure.

Aesthetic potential of the silhouette of church village

\[ L = T \times H \]

- \( L \) - degree of interest, attractiveness (originality) of the spatial structure;
- \( T \) - degree of information from 0 to 10;
- \( H \) - degree of harmony of the spatial structure from 0 to 10.

\[ S = H_{\text{max}} - H \]

- \( S \) - degree of chaos (disorder) in the spatial structure;
- \( H_{\text{max}} \) - optimal constant of harmony of the spatial structure equals 10.

\[ C = T \times S \]

- \( C \) - aesthetic potential of the spatial structure.

Fig. 8. General scheme of the model of assessment of aesthetic potential of the layout and spatial structure of church villages (scheme by V. Karvelytė Balbierienė with reference to N. A. Salingaros (2005)).

Fig. 9. Model of assessment of aesthetic potential of the layout and spatial structure of church villages is based on methodology by N. A. Salingaros (scheme by V. Karvelytė Balbierienė with reference to N. A. Salingaros (2005), photographs by V. Karvelytė Balbierienė, www.maps.lt).

Aesthetic-informative-emotional attraction of church villages compositions has been mathematically estimated applying methodology by N. A. Salingaros (2005). Optimality from the perceptive, aesthetic, and informative points of view of the composition of the structure of the church village layout and silhouette.
Changes of Compositional Features of Church Villages in Rural Landscape

depends on the relation of the two compositional features of the structure: T demonstrates the degree of complexity, diversity, information of composition. T value varies from 0 to 10 and is determined evaluating five aspects of the complex structure:
  – size of details (the smaller details get the lower value) and their activity in the whole composition (from 0 to 2);
  – density of differences and diversity (from 0 to 2);
  – curvature of lines (from 0 to 2);
  – intensity of colours (from 0 to 2);
  – contrast of colours (from 0 to 2).

Value T close to 10 demonstrates that the composition of the structure is complex and diverse.

H (harmony) demonstrates correlation of the objects in the composition and degree of the symmetry in the model. Value H varies from 0 to 10 and is determined evaluating five forms of symmetry in the scale from 0 (non-existing) to 2 (fully expressed):
  – vertical and horizontal reflection (from 0 to 2);
  – shifts and rotations (from 0 to 2);
  – similarity of forms (transformation, magnification and reduction) (from 0 to 2);
  – conformity of colors (from 0 to 2);
  – “physical” contact of forms (merging, overlapping) (from 0 to 2).

Value H close to 10 demonstrates that the composition of the structure is harmonious and in coherence with the other elements of the environment.

N. A. Salingaros (2005) proposes two composite indicators for the comparison of the optimality of the visually perceived structures:

L – interest of the structure:

\[ L = T \times H \] (1)

S – expression of the disorder in the structure, Hmax - constant to a certain type of the structure, HI - degree of harmony of the structure (the lower the degree of harmony of a structure in consideration compared to the maximum H value (Hmax) of this type of the structure, the more chaotic the structure is).

\[ S = H_{\text{max}} - H \] (2)

where:

\[ C = T \times S \] (3)

from here

\[ C = T \times (H_{\text{max}} - H) \] (4)

The relation between L and C of the structures under consideration demonstrates a certain reverse correlation. The analysis of various relations between complexity (C) and attractiveness (L) allows distinguishing the optimal structure for visual perception. The optimal composition should not be too harmonious or too chaotic and must provide the optimal quantity of information.

Aesthetic potential of the layout and silhouettes of church villages (C) varies from 1 to 100 degrees. If C (3) is higher than 50, the structure is complex, diverse and informative; if C (3) is lower than 50 the structure is smooth and even. The optimal aesthetic potential is around 50 (this proportion should be applied to all the indicators of aesthetic potential: T, H, L (1), S (2)). The example of Ugoniai church village can be analyzed in this respect. C (3) of this settlement is 49 (Fig.4). A very high C value demonstrates that the composition of the structure is more chaotic, irregular, than informative. For example, the silhouettes of Naujoji Þta and Drasûniškis church villages can be described as very chaotic with the C (3) value of 72 (Fig.6). A very low C value demonstrates the uniformity of the elements of the structure. The structure merges with the surrounding environment and is non-informative and boring to spectator. For example, aesthetic potential C of Gegužin church village is 1 (Fig.3). Homesteads and the church of this settlement are situated in the forested area and spectator can hardly distinguish its silhouette.

Assessment of the layout and spatial structure of the silhouettes of church villages has demonstrated that:

  – aesthetic potential C of church villages with the extant authentic compositional structure of the silhouettes varies from 1 to 72. Such variation can basically be explained by the influence of the elements of the natural environment;
  – changes in the layout of church villages are only partially reflected in the compositional structure of their silhouettes. This is determined by the number of residents, the type of layout, the relation between terrain and green structures which can eliminate or highlight the anthropogenous elements in the silhouette;
  – aesthetic potential of church villages layout (C) is only weakly related to the compositional features of their silhouettes.

5. Summing up and conclusions

1. Around 70 % of the analyzed church villages are currently the accumulations of large volumes visually dominating in the rural landscape. Their silhouettes have lost their compositional distinctiveness in Lithuanian rural landscapes formed in the past by the religious function.

2. Compositional links of church villages with the natural environment in the spatial structure of the rural landscape are defined by the features of the urban structures and their changes. Until the middle of the 20th century, church villages, as the spatial structures of the landscape shaped mainly by religious function had constituted
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LTRS mažų miestų architektūrinio formavimo pagrindinių tendencijų nustatymas ir pirmojo etapės nusprendimų bei klausimų, siekiant pagerinti šiuos miestų architektūrinęs sprendimą išryškinti: Mokslo tiriamojo darbo ataskaita / ASI; Vadovas arch.k.vyr.m.b. A. Miškinis. – Archyvinis Nr.458. – K., 1975. 107 p.


Rekomendacijos dėl rajonų į planoavimo schemų papildymo duomenimis apie kaimo gyvenvietės kultūriniu - buitinio ir komunalinio aptarnavimo tarpukalnio reikšmių įrašų koncentracijai stambio kaimo ir miesto tipo gyvenvietėse; Mokslo tir. darbo ataskaita / ASI; Vadovas geogr.m.k. V. Maldžiūnas. – K.,1973. 209 p.


Bažnytkaimių kompozicinių savybių kaita kaimo kraštovaizdyje

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Straipsnyje analizuojama bažnytkaimių kompozicinių savybių kaita kaimo kraštovaizdžio erdinėje struktūroje, išaiškinami šių savybių formavimąsi ir raidą lemiantys veiksmei. Siekiant nuodugniai įvertinti bažnytkaimių erdinės struktūros kompozicines savybes etnokultūriniai kraštovaizdyje, pateikiamas bažnytkaimių planinės ir erdinės struktūros estetinio potencialo vertinimas.