Comparative analysis of urban and rural environmental quality: the opinions of residents of the region

I S Baklanov¹, O A Baklanova¹, E E Nesmeyanov², V A Ivashova³ and L A Kabardokova⁴

¹ North Caucasus Federal University, 1, Pushkin Str., Stavropol, 355017, Russia
² Don State Technical University, 1, Gagarin Square, Rostov-on-Don, 344000, Russia
³ Stavropol State Agrarian University, 12, Zootechnicheskii Lane, Stavropol, 355017, Russia
⁴ Branch of MIREA - Russian Technological University in Stavropol, 8, Kulakova Av., Stavropol, 355035, Russia

E-mail: vivashov@mail.ru

Abstract. The article presents the results of a comparative analysis of the opinions of the rural and urban settlements’ population of the Stavropol Territory on the qualitative characteristics of the living environment. The quality of life in the village, which to a small extent depends on the state of the environment (transport accessibility of infrastructure and social facilities, road and pavement, lighting, etc.), plays a significant role in the choice of permanent residence. Currently, the rural population has high demands on the living environment. Rural settlements have territorial-landscape, climatic features, the historically established traditional spatial organization of rural settlements and the social lifestyle of the villager. Therefore, the urban model of improvement in rural areas cannot be used. It is important to study the opinions of local residents to understand the directions of transformation and improve the quality of the environment of rural settlements. Directions for the development of the environment of a settlement significantly depend on the characteristics of traditional socio-cultural practices of the population. This study allows us to more accurately formulate the desired contours of the model of the environment of settlements. On the example of a comparative analysis of the problems of transport accessibility of social infrastructure by residents in different types of settlements, we have shown the actual discrepancy in their significance. To plan directions for the development of rural transport infrastructure, it is necessary to solve the issues of hard cover for light-duty vehicles that are designed to carry small cargoes necessary for personal subsidiary plots.

1. Introduction
The improvement of rural settlements is relevant for a number of reasons. Firstly, the acceleration of scientific and technological progress and related innovations that increase the quality of life of the population of the city, all this is an important factor in choosing the life of the city rather than the village. Secondly, the difference in the improvement of the territories of settlements that are under the jurisdiction of municipalities deliberately puts citizens in unequal conditions, updating the issue of raising living standards in rural settlements. Thirdly, the territorial-landscape, climatic features, the historically established traditional spatial organization of rural settlements and the social lifestyle of a
rural resident don’t allow the direct use of the urban model of rural areas improvement. Therefore, it is important to study the opinion of residents of rural settlements in order to understand the directions of transformation and improve the quality of the environment of rural settlements.

The problems of this study are relevant not only for rural Russia and, in particular, the Stavropol Territory. A review of modern publications confirms the widespread interest and relevance of information regarding possible directions for the modernization of the rural environment.

Scientists Peña-García A., Sędziwy A. in their study cited the results of a comparative analysis of different lighting models for rural areas [1]. It is worth noting that the capabilities of LED equipment have great advantages in energy consumption over traditional lighting. For the spatial position of rural settlements and small municipal budgets, such a proposal for coverage is very relevant. At the same time, the issue of light pollution is becoming relevant. Scientists emphasized the multidimensional nature of the problem of light pollution and proposed not to reduce it to the formal prohibition of white LED.

Scientists Khadiyanto P., Soetomo S., Hadi S.P. in their article rightly raised the issue of the environmental quality of rural settlements [2]. They referred to already confirmed data on the direct relationship between environmental quality and the quality of life of people. Using the example of an Indonesian village, it is shown that the expansion of industrial zones negatively affected the environmental situation of this village. Infrastructure facilities, in particular water supply, are not designed for industrial level. The authors of the study note that the quality of the environment is determined by the condition of buildings, structures and infrastructure, location and accessibility, as well as the convenience of the physical environment. The quality of life is determined through health, economic, educational and social relations. The results showed that not in all regions with poor physical environmental conditions, people assess low quality of life as low. The decrease in environmental quality requirements is explained by the way of life of the rural population formed over many generations.

A definite confirmation of the need to take into account the lifestyle features of the rural population is the study of the author Kobi M. [3]. The author shows the significance of the needs of residents, analyzing the contours of urban architectural anthropology, which are characterized by social and material practices that are distinct from rural settlements in the winter season, the wide use of the artificial environment and climate control. He considers urban architecture as a social sphere, which has its own characteristics, including ethnographic ones. The study of the features of socio-cultural practices allows us to more accurately formulate the desired contours of the model of the environment of settlements.

The authors of Salamone F., Belussi L., Danza L., Ghellere M., Meroni I. developed a model for assessing the current energy and environmental behavior of the built-up environment and possible scenarios for updating the coverage of settlements [4]. An integrated approach, implemented in the energy-ecological analysis of the urban environment, is useful for the modernization of the environment of rural settlements.

The authors of Shao T., Jin H. in their publication consider the qualitative characteristics of traditional and new housing in rural areas [5]. The relevance of this study is dictated by the integration processes between the city and the village in modern China, which led to the active construction of housing. The results of the generalization of traditional approaches to the construction of rural housing and the additional features of modern energy-saving technologies, as well as the requirements for comfortable living, have identified improving factors. These include zoning of the thermal environment, optimization of heating modes, achieving energy conservation through additional thermal insulation in the construction of buildings. Important findings for our study are: the increasing demands of rural residents for housing comfort and the articulated need to take into account traditional approaches to rural development.

The authors of the study of the relationship between the temperature environment and thermal insulation of clothes for rural residents of China Zhao W., Chow D., Sharples S. came to a conclusion about the imbalance in the level of economic development between urban and rural areas [6].
Differences in incomes, living conditions and lifestyle affect the perception of thermal comfort by residents of urban and rural settlements. Thus, they emphasized significant differences in the perception of a comfortable environment and lifestyle of the rural and urban population. This statement aims us to study the differences in the perception of the environment in different types of settlements and emphasizes its relevance.

The theme of the climatic differences between urban and rural environments is relevant for many regions of the world [7, 8]. The authors of the study Taher H., Elsharkawy H., Newport D. analyzed the influence of urban green spaces on improving the microclimate in the urban environment using the example of large cities in England [9]. The mayor of London approved the London strategy until 2050, in which the improvement of urban green systems is planned through an increase in the number of trees, green walls and green roofs. The comparative characteristics of urban and rural settlements highlighted by the authors remain characteristic. Rural development is less dense, open spaces prevail, few impenetrable surfaces (roads, sidewalks, buildings, etc.) [10].

Thus, it is confirmed the assumption of the difference in the perception of the comfort of the living environment in different types of settlements; the characteristic differences between the urban and rural environments, such as buildings, lighting, landscaping pavements, etc. are determined. A study of the opinions of residents of the Stavropol Territory shows the relevance of this study in the Russian regions [11, 12, 13].

2. Materials and methods
In the Stavropol Territory, in 2019, a population survey was conducted on a random stratified sample. In total, 1187 people took part in it. The sample size allowed the segmentation of opinions of residents by type of settlements: the regional capital, cities, rural district centers, villages with a population of over 3 thousand people, villages with a population of less than 3 thousand people.

The formation of the population’s request for the qualitative characteristics of the living environment can be based on an assessment of the level of satisfaction with existing conditions. Areas of dissatisfaction determine the possible direction of the transformation of the settlement environment.

Table 1 presents comparative data characterizing the assessment of transport accessibility of social infrastructure by residents in various types of settlements.

A survey of residents of the Stavropol Territory was carried out in 2019 on a regional stratified sample, in which different types of settlements were presented. In total, 1049 people took part in the study, among them urban residents made up 59% (619 people) and rural people – 41% (430 people). According to the results of a questionnaire survey of the population, we can confidently talk about a significant difference in the level of comfort of the living environment of the urban and rural population.

| Type of location                      | Convenient to reach | Not convenient to reach |
|--------------------------------------|---------------------|------------------------|
| Regional Center                      | 64,8                | 35,2                   |
| City                                 | 66,7                | 33,3                   |
| Rural district center                | 54,1                | 45,9                   |
| Village over 3 thousand people       | 21,1                | 78,9                   |
| Village less than 3 thousand people  | 71,4                | 28,6                   |
| Total for the surveyed population    | 60,2                | 39,8                   |
In the segmentation by type of settlements, the most satisfied with the transport accessibility of the social infrastructure facilities were residents of small villages (with a population of less than 3 thousand people) – 71.4% said that it was convenient for them to get there. The level of satisfaction with this factor in the quality of the living environment is also above average for residents of cities and the regional capital: 66.7% and 64.8%, respectively. This situation is due to several reasons. Segmentation is presented in the following table.

| Type of settlement       | Walking (by transport) takes a lot of time | Rare appearance of (does not run) public transport | Public transport stop is far away | Parking problems | Poor pedestrian area | Poor condition or lack of ramps |
|--------------------------|------------------------------------------|--------------------------------------------------|--------------------------------|-----------------|---------------------|---------------------------------|
| Regional Center          | 33,3                                     | 11,1                                             | 0                              | 33,3            | 22,2                | 0                               |
| City                     | 34,6                                     | 23,1                                             | 7,7                            | 26,9            | 0                   | 3,8                             |
| Rural district center    | 50,0                                     | 25,0                                             | 0                              | 6,3             | 6,3                 | 0                               |
| Village over 3 thousand people | 73,3                                      | 6,7                                              | 0                              | 0               | 20,0                | 0                               |
| Village less than 3 thousand people | 25,0                                      | 25,0                                             | 50,0                           | 0               | 0                   | 0                               |
| Total for the surveyed population | 44,3                                      | 17,7                                             | 5,1                            | 17,7            | 10,1                | 1,3                             |

For villages with a population of over 3 thousand people and less dense development characteristic of rural areas, the main problem is the constant need to overcome great distances. Residents do this on foot or by transport, but in any case it takes a lot of time. The same problem, only slightly less acute is observed in rural district centers. It can be solved by more developed public transport options. For small villages, the most significant problem is the far-reaching public transport stops, as indicated by 50.0% of the survey participants.

There are 2 obvious interconnected vectors of the needs of rural residents: light motor vehicles for moving and transporting small loads and hard road surface, designed specifically for this type of transport.

For the regional capital and cities, parking problems are characteristic, which requires systemic solutions in planning the functional load on the urban space.

3. Conclusion
Based on a comparative analysis of the quality of the urban and rural environment, taking into account the opinions of residents of the southern region of Russia, a number of conclusions can be made:

1. Directions for the development of the environment of a settlement significantly depend on the characteristics of traditional socio-cultural practices of the population, the study of which allows us to more accurately formulate the desired contours of the model of the environment of settlements.
2. On the example of a comparative analysis of the problems of transport accessibility of social infrastructure by residents in different types of settlements, we have shown the actual discrepancy in their significance.

3. For planning directions for the development of rural transport infrastructure, it is necessary to solve the issues of hard cover for light-duty vehicles that are designed to carry small cargoes necessary for personal subsidiary plots.

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