

Transport accessibility assessment of rural tourism facilities

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Abstract. The paper presents the results of theoretical understanding of the transport accessibility of rural tourism facilities and an empirical study of the opinions of rural tourism consumers. On the basis of a brief review of scientific publications on the development of various types of rural tourism and the impact of transport accessibility of tourist facilities on them the relevance and significance of the research is determined. The factors that influence the choice of tourist products are formulated. Estimated judgments of survey participants are analysed and latent variables and the role of quality of transport infrastructure in the choice of tourist products are established on the basis of a statistical procedure of factor analysis. The data obtained constitute an important input for transport accessibility of rural tourism facilities and infrastructure decision-making in regions with a large share of rural areas. **Key words:** quality of transport infrastructure, transport accessibility, sociological survey, rural tourism facilities, sustainable rural development

1 Introduction

The development of rural tourism depends on many factors, among which the accessibility of tourist sites by transport occupies a special place. This is due to the fact that the main potential category of consumers of rural tourism services are city dwellers with a certain level of perception of the comfort of transport infrastructure and orientation to the means of transport used on urban roads. Traditionally, for Russian regions with large distances between settlements, there is a relevant difference in the quality of road surfaces, including in rural areas. In this sense, an important research issue for municipal authorities that develop rural tourism projects in subordinate territories is to clarify the level of expected comfort of the transport infrastructure according to the estimates of potential consumers.

The accessibility issues of the transport of rural tourism facilities are relevant not only for Russia. The analysis of publications that address various aspects of the subject field of our study confirms its relevance and importance for the development of rural tourism projects,

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which has great potential in ensuring the financial sustainability of rural municipalities and reducing the rural exodus to the city.

In the study of the following authors: Lam T.M., Wang Z., Vaartjes I., Beulens J.W.J., Lakerveld J. attention is paid to the development of an objectively measurable index of pedestrian accessibility [1]. The components of the index include parameters such as population density, retail and service density, land use patterns, street connectivity, green spaces, pavement density, and public transport availability.

An interesting option to improve the accessibility to transportation of rural tourism facilities is a regional bicycle network. The authors of the study are Scappini B., Zuca V., Meloni I., Piras F. The example of Sardinia shows an improvement in the accessibility of rural areas. We can see how the law on cycling in Italy has been put into practice in the region. As an additional effect, the targeted expansion of the regional cycling network has helped increase the flow of tourists from coastal to rural areas, which in the long term is seen as a strategic segment of local development [2]. This approach in identifying options for the development of rural transport infrastructure is interesting for regional projects in Southern Russia, in particular in Stavropol Krai. It is important to note that the expansion of the bicycle network has a multieffect: it expands the possibilities of using an environmentally friendly and inexpensive mode of transport for both locals and tourists.

The authors of the article Hasselder P., Brüchert T., Baumgart S., Bolte G. offer a promising approach in the development of transport infrastructure for small settlements - arrangement of footpaths and construction of special thematic routes for residents [3]. Using the example of the study conducted for the category of elderly citizens, the authors show that encouraging walking provides an active and healthy lifestyle for different categories of people. For our study, the development of walking themed routes to promote rural tourism is important. At the same time, developed pedestrian communication remains in the active use of local rural residents as well, which is relevant for expanding the attractiveness of rural communities as a permanent place of residence.

A thematic review of publications by Kusumastuti R., Silalahi M., Asmara A.Y., Hardiyati R., Juwono V. shows the main activities of people in rural areas. These are traditional food production, bioenergy, agriculture and tourism [4]. Thus, the rural area with its traditional production, according to the authors, represents a huge information layer of knowledge about environmental sustainability and the use of natural resources. This knowledge can act as sources of innovation and ensure economic growth in rural areas. And transport infrastructure plays a positive role in this process in providing processes [16, 20, 21]. Thus, the development of transport accessibility in rural areas remains a topical agenda of economic and social policy of the authorities [22, 23].

The development of rural tourism has a positive impact on the rural community. The authors of article Kunjuraman V., Hussin R., Aziz R.C. consider community ecotourism as an instrument of social transformation of the rural community [5]. In their opinion, an ambiguous estimation is possible, but the increase of knowledge in the field of hospitality and tourism, improvement of household culture, transport infrastructure is doubtless. Thus, the local government of rural areas of developing countries must motivate the local community to develop ecotourism, introducing appropriate measures and initiatives [15, 17, 18].

The question of rural tourism development is also urgent for such big country as China. The authors of the article Zhang Y., Guo Y., Ji L. emphasize the importance of intensive interpersonal interaction in the process of implementation of tourism services in rural areas [6]. The attachment to place and sense of place that rural residents have is emotionally transmitted to the participants of rural tours, which is positively reflected in the psychological well-being of tourists. This factor is a sought-after option for deciding to opt for rural tourism [12, 19]. Thus, the relevance of rural tourism choice is a multifactorial phenomenon. And in

order to achieve a positive result and consumer satisfaction it is necessary to create and maintain a situation of psychological comfort at all stages of tourist service consumption, including at the expense of transport reachability of the object, which does not reduce the positive effect. This logic of reasoning is taken into account when considering the conceptual framework for assessing the transport accessibility of rural tourism facilities. It shows the need to use a comprehensive assessment - it is not only travel time, road surface quality, availability of means of transport of acceptable comfort, etc. But also, the correlation with the purposefulness of consumers of rural tourism services and the readiness to change the understanding of the boundaries of comfort to confirm the priority of the purpose of the trip.

The results of rural tourism research conducted in Russia are noteworthy. The authors I.V. Lebedeva, S.L. Kopylova, T.A. Lebedeva note that focus group participants talk about difficulties with transport accessibility (namely, the presence of bad roads) as one of the key factors limiting the development of rural tourism. The comments include the following: "Transport accessibility is needed to be able to drive by car"; "If roads were made in Altai Krai, it would be much better"; "It is not possible to drive everywhere, even if you are willing to drive". [8]. Such statements confirm the importance of transport accessibility as an important factor in the development of rural tourism, and actualize the task of developing approaches to its assessment.

The development of rural tourism in our country is largely associated with the opportunities of transport infrastructure development projects in rural areas. The authors of the article Onayev A., Espey C., Swei O., carrying out the study of factors determining the growth of prices of road construction, have made a number of conclusions significant for our study on the basis of the long-term (12 years) analysis of data from a large number of territories (40 states) [7]. They identified six possible explanations for the increase in cost: (1) construction labour costs; (2) material prices; (3) the demand for higher quality roads; (4) market concentration; (5) the ratio of urban to rural roads; and (6) the relative costs of maintenance and repairs. A related important finding of the authors related to our study is the established growing demand for higher-quality roads, which, among other things, positively affects road safety in rural areas [14]. In this way, transport infrastructure safety standards are being translated into rural areas.

Modern digital technologies can successfully support the process of motivating choices in favour of rural tourism. Thus, the authors Mileti F.A., Miranda P., Langella G., Bancheri M., Terribile F. propose a valuable operational web tool, which can be useful for ecotourism and rural tourism users, economic planners and rural socio-economic policy makers [9]. Its essence is to create an electronic platform to bring together a multi-user community: farmers, tourism enterprises, associations and government agencies. The visual representation of a large number of data and, among others, rural tourism facilities, transport communication, pavement quality transforms them from being "alien" to the psychological marking "own" due to a preliminary visual familiarity. Thus, the methodology proposed by the authors related to the creation of the GCI platform (www.landsupport.eu) can be used to improve the assessment of transport accessibility of rural tourism facilities.

The COVID-19 pandemic has changed the consumer habits of tourists in favour of environmentally friendly destinations such as rural tourism, thereby mainstreaming the issues of transport accessibility of tourism facilities. According to the authors Sánchez-Rivero M., Rodríguez-Rangel M.C., Cerro P.G., García A.M.M. the current situation requires a comprehensive assessment of the socio-economic efficiency of business and ensuring stable employment of rural population involved in the process of tourist services [10, 13]. The methodology of an integrated approach in the development of rural tourism, which has gained additional relevance during the pandemic, in our opinion, includes a positive impact on the development of transport infrastructure in rural areas.

The authors of Larsson A., Ellmér E., Vafeiadis E., Curtis C., Steiner A. found in the course of the study that there are significant differences in the availability of amenities depending on the mode of transport for different types of settlements [11]. The authors note that the topic of sustainability of transport accessibility is insufficiently studied at the moment and, at the same time, is relevant for small towns and rural areas, as it has a significant impact on the quality of life of the population in Sweden. The presented experience in the development of methodological approaches and tools for assessing the sustainability of transport accessibility in small towns and rural areas can be useful for our study in the conditions of southern Russia. As an analytical framework, the authors of the article used publicly available data describing the total population and workplaces geocoded at a resolution of 100 meters. As well as the availability of important everyday services within a short travel time.

Thus, the analysis of documentary sources on the assessment of transport accessibility of rural tourism facilities, the development of transport infrastructure in rural areas confirmed the relevance and significance of the research topic.

2 Materials and methods

The empirical part of the research on the views of rural tourism consumers, and the definition and role of the quality of transport infrastructure in choosing tourism products, was carried out in Stavropol Krai in June 2022. To collect primary sociological information, an electronic questionnaire method was applied through the Google Form. A total of 426 people from among visitors to rural tourism facilities in the region took part. The data obtained from the survey were processed in the SPSS Statistics program (version 23) and presented in the generalized form of statistical distributions. For the development of evaluation tools there was applied a proven methodology of all-Russian research of the authors Lebedeva I.V., Kopylova S.L., Lebedeva T.A. [8], which included 9 variables that describe the factors of choice of a particular type of rural tourism: accommodation conditions; cost of travel; travel safety; transport accessibility; level of service in the place of rest; geographical direction of recreation; sightseeing and cultural and entertainment program recreation; infrastructure for children; availability of specially protected natural area. A five-point evaluation scale was used in our study - from 1 point (the variable is not important in choosing a certain type of rural tourism), to 5 points (the variable is very relevant in choosing a type of rural tourism). A statistical factor analysis procedure in SPSS Statistics (version 23) was used to analyse the database that characterises the variables introduced in the decision-making process of selecting a rural tourism type.

3 Results and discussion

Let us turn to the results of the factor analysis. The starting point of the statistical construction of the structural model of the conditions of the population's choice of rural tourism was the determination of the total explained variance. According to the results of statistical processing of the survey database in the SPSS Statistics program (version 23), the full explained variance was 81.325% and was determined by 4 components. The data are presented in Table 1.

Table 1. Fully explained conditions of the residents' choice of rural tourism.

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
Accommodation conditions	2.355	26.170	26.170	2.355	26.170	26.170	1.941	21.562	21.562
Travel cost	1.859	20.652	46.822	1.859	20.652	46.822	1.892	21.017	42.579
Travel safety	1.661	18.454	65.276	1.661	18.454	65.276	1.801	20.014	62.593
Transport accessibility	1.444	16.049	81.325	1.444	16.049	81.325	1.686	18.733	81.325
Level of service at the holiday destination	0.792	8.798	90.123						
Geographical area of the holiday	0.522	5.800	95.923						
Excursion, cultural and recreational programme	0.300	3.329	99.252						
Infrastructure for children	0.056	0.625	99.877						
Natural area of special protection	0.011	0.123	100.00						

The listed 9 indicators determining the conditions of the population's choice of rural tourism were evaluated by the survey participants according to their importance for the respondents. As a result of factor analysis performed by the Rotation Method: Varimax with Kaiser Normalization (Rotation converted in 9 iterations), a factor model with 4 factors was formed.

Table 2. Rotated component matrix describing a factor model of the conditions of the residents' choice of rural tourism.

	Component			
	1	2	3	4
Accommodation conditions	-0.404	-0.631	-0.433	0.317
Travel cost	-0.753	0.295	0.030	0.304
Travel safety	0.460	-0.107	-0.398	0.774
Transport accessibility	-0.107	0.855	-0.260	-0.021
Level of service at the holiday destination	-0.052	0.735	-0.209	0.221
Geographical area of the holiday	-0.145	-0.142	0.851	-0.017
Excursion, cultural and recreational programme	0.271	-0.166	-0.205	-0.907
Infrastructure for children	0.904	0.150	0.108	0.146
Natural area of special protection	0.269	-0.232	0.752	0.036

The first factor is determined by the following set of variables: infrastructure for children (factor load ratio 0.904); cost of travel (factor load ratio -0.753). The first factor is interpreted as prioritising favourable conditions for travelling and receiving tourist services with children. The priority development vector that can be formulated on the basis of the first factor is the development of tourist products of cognitive nature (natural ecosystems, culture and customs of small towns and villages, farms and private subsidiary farms), initially designed for family holidays with children. The goal of this segment of rural tourism

consumers is to introduce children to the rural way of life and to change the rhythm of big city life to the rural dimension. The presence of children among the consumers shows the importance of transport accessibility and quality, including transport infrastructure for this category.

The second factor is determined by the following set of variables: transport accessibility (factor load factor 0.855); level of service in the recreation area (factor load factor 0.735); accommodation conditions (factor load ratio - 0.631). The second factor is interpreted as an acceptable ratio of the time spent on reaching the vacation destination and the level of service at the vacation destination. The priority vector of tourist products development in rural tourism, which can be formulated on the basis of the second factor - providing transport accessibility and a high level of service in the recreation areas of rural tourism consumers. To get quickly and comfortably to spend time in places of service provision is the main target of this segment of consumers. Here we also see the high importance of the quality of transport infrastructure in the development of rural tourism.

The third factor is determined by the following set of variables: geographical destination of recreation (factor load ratio 0.851); presence of specially protected natural area (factor load factor 0.752). The third factor is interpreted as a preference for the environmental component in rural tourism. The priority vector of development here is the development of possible areas of ecotourism as a type of rural tourism, taking into account the availability and transport accessibility of natural areas in the region, including specially protected areas.

The fourth factor is determined by the following set of variables: travel safety (factor load ratio 0.774); excursion and cultural and leisure program (factor load ratio - 0.907). The fourth factor is interpreted as a preference for a safe and free holiday with minimal excursion support. The priority vector of development is to ensure, on the part of the organizers, comprehensive security of rural tourism, which, of course, includes a transport component.

Thus, as a result of the statistical procedure of factor analysis based on the variables from the database of the survey of 426 visitors to rural tourism facilities of Stavropol Krai, it is found that the transport component, as a significant element of choice, is present in all 4 factors of the structural model of decision-making conditions of the population on the choice of rural tourism.

4 Conclusion

Theoretical analysis of scientific sources, empirical results of the study confirm the importance of transport accessibility of rural tourism facilities for making decisions about the choice of tourist products. The thematic review of publications presented in the scopus science base has shown a number of important components of the integrated development of rural transport infrastructure that will meet the needs of rural tourism development:

- equipping pedestrian and bicycle paths connecting tourist infrastructure facilities and important commercial, domestic, educational organisations of rural settlements and agribusinesses;
- improving the quality of the pavement in rural settlements and the surrounding areas of AIC associated with tourism facilities to the level of the city
- availability of important everyday services within a short travel time;
- improved road safety in rural areas.

Based on the results of the survey of visitors to rural tourism facilities in southern Russia, a factor model with 4 factors was formed based on the assessment of 9 indicators determining the conditions of the population's choice of rural tourism:

The first factor is the development of tourist products of cognitive nature (natural ecosystems, culture and customs of small towns and villages, farms and private subsidiary

plots), initially designed for family holidays with children. The goal of this segment of rural tourism consumers is to introduce children to the rural way of life and to change the rhythm of big city life to the rural dimension. The presence of children among the consumers shows the importance of transport accessibility and quality, including transport infrastructure for this category.

The second factor is to ensure transport accessibility and a high level of service in the recreational areas of rural tourism consumers. To get quickly and comfortably to spend time in places of service provision is the main target of this segment of consumers. Here we also see the high importance of the quality of transport infrastructure in the development of rural tourism.

The third factor is the development of possible areas of ecotourism as one of the types of rural tourism, taking into account the availability and transport accessibility of natural areas of the region, including specially protected areas.

The fourth factor - preference of safe and free rest with the minimum excursion support. The priority vector of development is to ensure, on the part of the organizers, comprehensive security of rural tourism, which, of course, includes a transport component.

Each of these important factors determines the vectors of rural tourism development and assessment of the role of transport infrastructure in this process.

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