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THE IMPACT OF CLIMATE CHANGE ON RURAL AREAS AND RURAL TOURISM: AWARENESS AND PERCEPTIONS

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Abstract: *The latest IPCC report highlights that global warming is causing increased and potentially irreversible changes, with Europe facing more frequent and intense extreme weather. A temperature rise of 2 °C could critically impact nature and human life. The study aimed to assess awareness and perceptions of climate change's impact on rural areas and tourism among participants from five Croatian counties, including 59 rural tourism entrepreneurs from the private sector and 45 respondents from the public sector. A survey was conducted separately for both sectors between May 2020 and October 2022, with respondents participating voluntarily and anonymously. Descriptive and inferential statistical methods were applied to analyze awareness and perception of climate change's impact on rural tourism. The findings indicate that public sector respondents have a higher average assessment score (AS = 4.43) compared to the private sector (AS = 3.97). Additionally, the public sector shows more consistent responses (SD = 0.74) versus the private sector's greater variability (SD = 0.95), reflecting uniform attitudes in the public sector and diverse views in the private sector. Factor analysis revealed that private sector stakeholders' perceptions include multiple interconnected dimensions: market orientation, awareness of climate risks, the need for education, and understanding of climate conditions as an economic resource. Data processing was performed using STATISTICA 13.0, confirming that the private sector's perceptions are more fragmented compared to the public sector's more cohesive viewpoint on climate change impacts.*

Keywords*: climate change, rural areas, tourism*

JEL Classification: *L83, R11, Q54*

INTRODUCTION

Climate change is one of the greatest global challenges of our time, and its impact on rural areas is of particular concern. Communities in these areas, which are

often dependent on ag-riculture, livestock farming and tourism, or the exploitation of natural resources, are highly vulnerable to changes in climate conditions. Such changes can significantly affect the quali-ty of life, economic opportunities and social stability in rural areas, which in many cases already struggle with high levels of poverty and a lack of basic infrastructure.

Rural economies are heavily dependent on agriculture, which is directly affected by climate change. Changes in temperature, precipitation, and the frequency of extreme weather events (such as droughts, floods, storms) can significantly affect crop yields. In many cases, farm-ers face unpredictable weather conditions, making it difficult to plan planting and harvesting. Climate change is also causing serious changes in the environment of rural areas. Changes in temperature and precipitation can affect the quality of the soil, reducing its fertility and ability to support plant growth. Also, the increase in temperature can affect biodiversity, as many species of plants and animals cannot withstand sudden climate changes and migrate or become extinct, which directly affects the tourist offer of the area. According to the results of climate modeling on the HPC Velebit system for the purposes of drafting the Climate Change Adaptation Strategy of the Republic of Croatia until 2040 with a view to 2070 and the Action Plan (Sub-activity 2.2.1.), in the period until 2070 the largest increase in average air temperature is up to 2.2 °C, a slightly smaller increase could be in the summer in the northernmost regions and Slavonia, and in the autumn in most of Croatia (Hrvatski sabor, 2020). As stated in the paper Effects of climate change on international tourism, the indigenous population, investors in tourism, ecosystems and geo-diversity suffer from the consequences of increasing temperatures during the summer season and floods during the winter season (Hamilton, Maddison, & Tol, 2005).

Climate change can lead to population migration from rural areas, as people seek a better quality of life in cities or in other countries, which reduces the workforce and slows down the development of these communities, which is already happening in rural areas of the Re-public of Croatia, according to the latest census dana (Državni zavod za statistiku, 2024). That is why the aim of this study is to determine the awareness and perception of partici-pants about the impact and dynamics of climate change and their consequences on rural are-as and the rural tourism sector.

Climate change is having an increasing impact on tourism worldwide, as changes in the en-vironment, weather conditions and seasonality can significantly affect destinations, tourism activities and the entire tourism sector. This impact is not uniform and varies depending on the region, the type of tourism, and the specific climate changes that are occurring. Just some of the key ways in which climate change affects tourism are changes in the seasonality of tourism, impacts on natural attractions, and changes in the attractiveness of destinations.

Although the challenges associated with climate change in rural areas are significant, there are also opportunities for adaptation and reduction of their negative effects, i.e. the devel-opment of adaptation and strategic plans, which include the use of more resilient practices. It is with the help of this research into the structure of stakeholder perceptions of the impact and dynamics of climate change and their consequences on rural areas and the rural tourism sector that attempts are made to generate possibilities for adapting the tourism offer in rural areas to climate change, i.e. proposals for measures for adapting the tourism offer in rural tourism to climate change.

Climate change requires coordinated efforts at all levels from local communities to national and international organizations. Only through joint work, investment in sustainable devel-opment and education, rural areas can build resilience to climate change and ensure a sus-tainable future for tourism. As shown by the research Berred, Berred & Fedli rural tourism is practically the only activity that generates income in such an area (Berred, Berred, & Fadli, 2022). The management of natural and cultural heritage products, within the conceptual framework of protection, has proven to be necessary. The authors in their book Tourism and global environmental change state that the best proposal at this point is the creation of new policies and management plans for conservation(Gössling & Hall, 2006).

LITERATURE OVERVIEW

The expected impacts, vulnerability and resilience of rural tourism to climate change are issues that have been addressed by an increasing number of authors in recent years. Climate change will have far-reaching consequences for the future of tourism. The Climate Change Vulnerability Index for Tourism (CVIT), which consists of 27 indicators, provides a transparent and systematic first analysis of the different vulnerabilities of the tourism sector in 181 countries. The countries with the lowest vulnerability are located in Western and Northern Europe, Central Asia, Canada and New Zealand. The sector's high vulnerability is located in Africa, the Middle East, South Asia and small island developing states (Scott, Hall, & Gossling, 2019)

Vulnerability is highest in many countries where tourism represents the largest share of GDP and in regions where tourism growth is expected to be the highest in the coming decades. According to data from the Croatian National Bank, Croatia has tourism revenues in 2023 higher by 11.4%, i.e. tourism's share in GDP is 19.6% (Croatian National Bank, 2024).

A meta-analysis of 290 climate change elasticity estimates across 34 studies indicates that climate factors substantially influence tourism demand. Findings suggest that low- and middle-income economies may experience significant tourism losses due to climate change. In contrast, high-income countries might see increased travel demand, potentially exacerbating climate-related challenges (Zhou, Faturay, Driml, & Sun, 2024).

An analysis of Caribbean countries reveals that climate vulnerability negatively impacts international tourism revenues. The study suggests that as extreme weather events become more frequent and severe, increased investment in adaptation and mitigation is essential to reduce vulnerabilities in the tourism sector (Cevik & Ghazanchyan, 2021)

An analysis of Australia's bushfires in late 2019 and early 2020 resulted in an estimated economic loss to the tourism industry of $2.8 billion. The fires affected regions such as Kangaroo Island, causing significant financial losses for tourism businesses. The impact of the disaster extended beyond the direct loss of revenue, affecting various businesses within the tourism supply chain. The impact of climate change on a global scale is outlined, and the importance of adaptation to it will be highlighted below (Reiner, Pathirana, Sun, Lenzen, & Malik, 2024).

A case study from Tata, Bani Geopark in Southern Morocco examines the challenges climate change poses to rural geo-biological and cultural tourism activ-

ities in semi-arid areas. The study identifies management challenges arising from rising temperatures and floods, emphasizing the need for sustainable management of natural and cultural heritage (Berred, Berred, & Fadli, 2022). According to authors Velea et al. there are various motives underlying tourists' choice of rural destinations, among which the natural environment and outdoor activities play a significant role. The authors believe that this makes tourism vulnerable to climate change through the direct effect of changes in the attractiveness of climatic conditions, with indirect effects due to the expected impacts on other related socio-economic sectors (Velea, Irimescu, Bojariu, & Chitu, 2024). In this context, increasing the resilience of rural tourism to climate change is a complex issue that needs to be considered through adaptation measures focusing on tourism specificities in synergy with adaptation measures in related sectors (e.g. energy, land and water management, aspects of urbanization). The above is followed by the work of the authors Alkier Tomić et al. (2012), who emphasize that Croatian rural areas possess valuable natural heritage that can improve the quality of tourism products. They advocate the creation of a rural-cultural tourism offer through projects such as "Integration of culture and rural tourism", with the aim of preserving heritage while promoting economic growth (Alkier Tomić, Milojica, & Drpić, 2012).

In the magazine Ekonomska misao i praksa, article entitled "Povezanost klimatskih promjena i turizma: multikriterijska analiza ocjenjivanja mjera prilagodbe" explores ways in which Croatian tourism can adapt to new climate conditions. Authors Šverko Grdić et al. use the method of interviews with key tourism stakeholders and multi-criteria analysis to rank adaptation measures (Šverko Grdić, Krstinić Nižić, & Mamula, 2017). Also, in the publication *IRMO aktualno*, article "Klimatske promjene i turizam – mjere za održivu budućnost" analyzes how climate change affects tourism and proposes measures for adaptation and mitigation of negative effects. Authors emphasize the importance of integrating sustainable practices into the tourism offer (Tišma, Boromisa, & Jelinčić, 2022). These articles and article Milinković et al. (2023) highlight the need for a strategic approach to climate change adaptation in tourism, including the development of sustainable practices and continued collaboration between all stakeholders in the tourism industry. The sustainability of tourism development, as well as other activities, depends on the ability of the environment to provide a stable and long-term development basis (Milinković, Sredojević, & Kljajić, 2023).

Back in 2014, Demonja D. analyzed the state of rural tourism in Croatia and concluded that there is a strong demand for rural tourism in all its many forms on the market. It was concluded that rural areas are underutilized in terms of tourism, and that rural tourism in Croatia has the potential to become one of the main determinants of development in hitherto marginalized areas (Demonja, 2014). Today's research shows that The Republic of Croatia is achieving progress according to key indicators of tourist competitiveness and realizing positive trends in almost all segments of tourism activities, and this should continue, but with adjustments to the tourist offer.

Rural tourism also promises to revitalize Croatia's rural areas by taking advantage of the country's diverse climatic, ecological and regional conditions. Grgić et al. (2017) note that diversity should be viewed as a comparative advantage, suggesting that rural tourism can stimulate economic activity and employment, especially among young people, thereby contributing to rural development (Grgić, Hadelan, Krznar, &

Zrakić, 2017). Developing a tourism offer that is attractive to investors can have a significant impact on GDP growth and employment.

It is also necessary to mention the private sector, namely small and medium-sized tourism enterprises that face the challenges of adapting to sustainability requirements. Čapeta et al. (2023) identify that business risks and operational challenges negatively affect the sustainable development of tourism (Čapeta, Fuchs, & Manestar, 2023). Addressing these issues is crucial for aligning tourism practices with environmental and social sustainability goals.

The reviewed literature highlights the multifaceted relationship between climate change and rural tourism in Croatia and globally. Addressing the challenges and seizing opportunities requires a collaborative approach, integrating sustainable practices, cultural preservation, and climate-sensitive strategies to ensure the long-term sustainability of both the environment and the tourism sector**.**

METHODOLOGY

Descriptive statistics methods were used to process the results. Basic statistical indicators were calculated for all variables: arithmetic mean (AS), standard deviation (SD), minimum (Min) and maximum (Max) values, median (Med) and mode (Mod). In order to gain a deeper insight into the structure of stakeholders' perceptions of the impact and dynamics of climate change and their consequences on rural areas and the rural tourism sector, factor analysis was also conducted in the part relating to the private sector. Statistical data processing was carried out using the software package STATISTICA 13.0.

The aim of the research is to determine the structure of stakeholders' perceptions of the impact and dynamics of climate change and its consequences on rural areas and the rural tourism sector in the public and private sectors.

The research included respondents from the private and public sectors. The private sector included a total of 49 respondents. These are entrepreneurs active in the field of rural tourism, who operate in tourism, agriculture and in combined activities, i.e. on farms that simultaneously produce agricultural products and provide tourism services. The public sector consisted of a total of 70 respondents. This group included representatives of institutions that support the development of tourism and the sustainability of rural areas. The respondents included representatives of tourist boards, local government units, non-profit organizations focused on sustainable development and institutions that monitor and analyze climate change. All respondents participated voluntarily and anonymously. Data were collected by completing a survey questionnaire during the period May 2020 to October 2022, during organized consultations with project stakeholders, at round tables, workshops, expert meetings and conferences.

INSTRUMENTS AND PROCEDURES

In order to determine the structure of stakeholders' perceptions of the impact and dynamics of climate change and their consequences on rural areas and the rural tourism sector, two survey questionnaires were used, one intended for respondents from the public sector and the other from the private sector. The questionnaire for the public sector contained a total of 9 items, while the questionnaire for the private sector included 13 items. All variables were designed as statements to which respondents

expressed their level of agreement, or assessment, using a five-point Likert scale. The scale values ranged from 1, which indicates no or very low level of agreement or importance, to 5, which indicates an extremely high level of agreement or importance. Below is an overview of all variables used in the study, with the corresponding labels indicating sector affiliation.

Public sector variables

1. J-UKP – Familiarity with the problem and dynamics of climate change
2. J-VLT – Assessing the impact of high summer temperatures on tourism demand
3. J-OTP – Assessing the impact of orienting the tourism offer to be less susceptible to climate change
4. J-PSP – Assessment of the impact of the extension of the tourist season on the tourist offer
5. J-IGP – Assessment of the impact of seasonal changes on the tourism offer in rural areas
6. J-EZO – Assessment of the importance of education on environmental protection and climate change for business
7. J-ALP – Assessment of the importance of offering autochthonous, traditional and local products for tourism demand
8. J-PAP – Assessment of the importance of promotional activities of the tourist offer for business
9. J-SVI – Assessment of the level of cooperation with higher education and research institutions

Private sector variables

1. P-UKP – Familiarity with the problem and dynamics of climate change
2. P-VLT – Assessing the impact of high summer temperatures on tourism demand
3. P-STK – Assessment of the extent to which foreign tourists consider climate to be an important factor when choosing a destination
4. P-PSP – Assessment of the impact of the extension of the tourist season on the tourist offer
5. P-IGP – Assessment of the impact of seasonal changes on the tourism offer in rural areas
6. P-PLP – Assessment of the importance of natural beauty and preservation of the continental area for the tourist offer
7. P-ALO – Assessing the importance of the attractiveness of a location for the tourist demand of your own business
8. P-KPP – Assessment of the impact of climate change on the production of products within the tourism offer
9. P-EZO – Assessment of the importance of education on environmental protection and climate change for business
10. P-PVK – Assessing the importance of high-quality product offerings for tourism demand
11. P-ALP – Assessment of the importance of offering autochthonous, traditional and local products for tourism demand

12. P-ROT – Assessment of the growth and sustainability of the tourism offer in the last five years
13. P-PAP – Assessment of the importance of promotional activities of the tourist offer for business

RESULTS

Descriptive indicators within the public sector, Table 1. indicate a strongly positive perception of stakeholders on the impact of climate factors and the importance of certain strategies in the context of rural tourism. The highest average values were recorded for the variables J-ALP - assessment of the importance of the supply of indigenous, traditional and local products for tourism demand (AS=4.74), J-PAP - assessment of the importance of promotional activities (AS=4.50), J-EZO - assessment of the importance of environmental education for business (AS=4.49) and J-PSP - assessment of the impact of the extension of the tourist season (AS=4.43). These variables, with average values above 4.40, indicate that respondents from the public sector attach the highest importance to sustainable and promotional aspects of the tourist offer, as well as to climate change adaptation strategies.

Table 1. Descriptive indicators, public sector (N=70)

Variable	AS	SD	Med	Mod	Min	Max	Skew	Kurt
J-UKP	4,04	0,79	4	4	2	5	-0,26	-0,84
J-VLT	4,09	0,79	4	4	2	5	-0,33	-0,83
J-OTP	3,77	0,76	4	4	2	5	0,02	-0,56
J-PSP	4,43	0,83	5	5	1	5	-1,59	2,99
J-IGP	4,09	0,81	4	4	2	5	-0,49	-0,44
J-EZO	4,49	0,88	5	5	1	5	-1,66	2,39
J-ALP	4,74	0,61	5	5	2	5	-2,63	7,07
J-PAP	4,50	0,65	5	5	3	5	-0,96	-0,16
J-SVI	3,16	1,30	3	3	1	5	-0,26	-0,94

AS–arithmetic mean, SD–standard deviation, Med–median, Mod–mode, Min–minimum score, Max–maximum score, Skew–coefficient of asymmetry, Kurt–coefficient of flatness

Source: Author

The variable J-ALP stands out in particular, which, along with the highest arithmetic mean (AS=4.74), also shows the highest degree of homogeneity among the responses (SD=0.61) and strong negative asymmetry (Skew=-2.63). These results indicate a high level of agreement among respondents on the importance of integrating local products into the tourism offer. On the other hand, the variable J-SVI - assessment of the level of cooperation with higher education and research institutions shows the lowest mean value (AS=3.16) and also the highest heterogeneity (SD=1.30). Such dispersion of responses indicates an uneven practice of cooperation among public sector institutions and possible structural or organizational barriers in achieving partnership relations with the academic community. The median and mode values for most variables are 4 or 5, which confirms the dominance of higher scores and further supports

the finding of a positive perception of public sector stakeholders. The results also show that the values of the asymmetry and flattening coefficients are mostly within acceptable limits, which indicates a normal distribution of the results. Most variables show negative asymmetry of the distribution, which means that the responses are dominantly directed towards the higher values of the scale, i.e. that the respondents generally express a positive and supportive attitude towards the statements in the questionnaire. The appearance of a high kurtosis value for the J-ALP variable (Kurt=7.07) further confirms the concentration of responses around the highest values, which further emphasizes the consensus among the respondents regarding the importance of local and authentic tourist offers.

Descriptive indicators Table 2. indicate a positive perception of stakeholders from the private sector regarding various aspects of climate change and their connection with tourism and rural development. The highest average values were recorded for the variables P-ALP - assessment of the importance of the supply of indigenous, traditional and local products for tourism demand (AS=4.18), P-EZO - assessment of the importance of environmental education (AS=4.00), P-PAP - assessment of the importance of promotional activities (AS=4.00), and P-PVK - supply of high-quality products and P-ALO - attractiveness of the location (AS=3.96). The mean values of these variables range between 3.96 and 4.18, which indicates a high degree of agreement of respondents with statements related to the sustainability, promotion and quality of the tourist offer.

Table 2. Descriptive indicators, private sector (N=49)

Variable	AS	SD	Med	Mod	Min	Max	Skew	Kurt
P-UKP	3,63	1,15	4	4	1	5	-0,51	-0,58
P-VLT	3,90	1,18	4	5	1	5	-0,75	-0,64
P-STK	3,73	1,00	4	4	2	5	-0,36	-0,85
P-PSP	3,76	1,09	4	4	1	5	-0,59	-0,51
P-IGP	3,78	1,01	4	4	1	5	-0,93	0,89
P-PLP	3,88	0,93	4	4	1	5	-1,06	2,02
P-ALO	3,96	1,06	4	5	1	5	-0,79	-0,08
P-KPP	3,65	0,86	4	4	2	5	-0,08	-0,57
P-EZO	4,00	0,87	4	4	1	5	-0,80	1,34
P-PVK	3,96	0,89	4	4	1	5	-0,66	0,82
P-ALP	4,18	0,83	4	4	2	5	-0,81	0,14
P-ROT	3,90	1,03	4	5	1	5	-0,63	-0,15
P-PAP	4,00	1,02	4	5	1	5	-0,86	0,24

AS–arithmetic mean, SD–standard deviation, Med–median, Mod–mode, Min–minimum score, Max–maximum score, Skew–coefficient of asymmetry, Kurt–coefficient of flatness

Source: Author

The lowest arithmetic mean (AS = 3.63) was recorded for the variable P-UKP, which refers to familiarity with the problem and dynamics of climate change. This may indicate a relatively lower level of information among respondents from the pri-

vate sector on this topic, compared to other aspects of the survey. The standard deviation (SD) values range from 0.83 to 1.18, indicating moderate variability in responses. Such a range suggests that the perceptions of respondents are partially uniform, without extreme dispersion, which allows for reliable interpretation of mean values and the application of parametric analyses. Most variables show values of asymmetry coefficients (skew) that are negative, suggesting that responses are mainly concentrated towards higher values of the scale. The values of flattening (kurtosis) are also within acceptable limits, indicating a regular distribution of results without pronounced deviations. The median and mode values for almost all variables are 4, while the minimum values range between 1 and 2, and the maximum is always 5. These values confirm the existence of a wide range of individual perceptions, but with a tendency for higher scores to dominate. Variables such as P-KPP and P-EZO show lower standard deviation values (SD < 0.90), which indicates a relatively high level of agreement among respondents regarding the impact of climate change on tourism production and the importance of education. Overall, the results indicate stable and relatively homogenized patterns of perception, with a clear orientation of private sector stakeholders towards sustainable, high-quality and market-recognizable forms of tourism offer.

Table 3. Descriptive indicators, differences between the public and private sectors

Variable	JSE (N=70)					PSE (N=49)				
	AS	SD	Med	Mod	Ras	AS	SD	Med	Mod	Ras
J-UKP	4,04	0,79	4	4	3	3,63	1,15	4	4	4
J-VLT	4,09	0,79	4	4	3	3,90	1,18	4	5	4
J-PSP	4,43	0,83	5	5	4	3,76	1,09	4	4	4
J-IGP	4,09	0,81	4	4	3	3,78	1,01	4	4	4
J-EZO	4,49	0,88	5	5	4	4,00	0,87	4	4	4
J-ALP	4,74	0,61	5	5	3	4,18	0,83	4	4	3
J-PAP	4,50	0,65	5	5	2	4,00	1,02	4	5	4

AS–arithmetic mean, SD–standard deviation, Med–median, Mod–mode, Min–minimum score, Max–maximum score, Ran– result scores

Source: Author

For the purpose of a deeper analysis of the understanding of stakeholders' perceptions of the impact and dynamics of climate change and the consequences for rural areas and the rural tourism sector, Table 3. presents descriptive statistical indicators for the public and private sectors, exclusively for those variables that are common to both groups of respondents. The largest differences in the arithmetic mean were recorded for the variable ALP - offer of indigenous, traditional and local products, where the average value in the public sector is significantly higher (AS=4.74) compared to the private sector (AS=4.18). A similar pattern was observed for the variables PAP - promotional activities and PSP - extension of the season, where the differences in favor of the public sector were 0.50 and 0.67, indicating a stronger evaluation of promotional and seasonal aspects of tourism among representatives of public institutions. On the other hand, the smallest differences in average values were observed for the variables VLT - the impact of high summer temperatures and IGP - seasonal changes, where the

deviations are less than 0.30, which indicates relatively consistent views of the public and private sectors regarding direct climate factors. When it comes to standard deviation (SD), the values in all variables are higher in the private sector, which indicates a greater diversity of views within this group of respondents. Public institutions show more uniform responses, which may be a consequence of institutionally focused strategies or a greater degree of standardization in their operations.

The mean values of all arithmetic means for the analyzed variables indicate a higher level of assessments in the public sector (AS = 4.43) compared to the private sector (AS = 3.97). At the same time, the average value of the standard deviation in the public sector is 0.74, while in the private sector it is higher and amounts to 0.95, which indicates a greater uniformity of responses among respondents in the public sector, in contrast to a more pronounced variability of attitudes within the private sector.

Such differences may point to several important aspects. A higher average arithmetic mean in the public sector may reflect a stronger institutional awareness and a more formal orientation towards climate change and sustainable development issues, possibly driven by strategies, policies or programmes implemented at the level of public bodies and organisations. On the other hand, lower mean values in the private sector could indicate different levels of information, experience or perception of the importance of certain aspects of climate change among entrepreneurs, which may depend on their immediate business context. A higher standard deviation in the private sector suggests diversity in experiences and attitudes, which may be the result of a wider range of activities, differences in the size and resources of companies, as well as the degree of direct exposure to climate impacts. In contrast, lower variability in the public sector may indicate a higher degree of alignment of attitudes, which may be a consequence of shared institutional priorities, professional networking and the availability of relevant information through public channels.

In order to gain a deeper insight into the structure of stakeholders' perceptions of the impact and dynamics of climate change and their consequences on rural areas and the rural tourism sector, a factor analysis was also conducted in the part relating to the private sector. Respondents from the private sector came from different business contexts, including tourism, agriculture and mixed activities, which further increased the likelihood of different patterns of attitudes and interpretations. Also, the overall lower average value of all arithmetic means (AS = 3.97) indicates a somewhat more restrained agreement with the statements, which may be an indicator of the fragmentation of perceptions within the group of respondents. In this sense, factor analysis is an appropriate statistical method for identifying hidden dimensions of perception, which were not directly observable in descriptive indicators.

Table 4. shows the factor structure of stakeholders' perceptions of the impact and dynamics of climate change and their consequences on rural areas and the rural tourism sector, for the private sector. The number of extracted factors in this study is four, and they explain a significant amount of variance according to the Kaiser-Guttman criterion. (Eigenvalue > 1).

Table 4. Factor structure, private sector

Varijabla	Faktor1	Faktor2	Faktor3	Faktor4
P-UKP	0,21	0,82*	0,17	-0,01
P-VLT	0,07	0,84*	0,21	0,29
P-STK	0,20	0,32	0,08	0,75*
P-PSP	-0,05	0,20	0,66	0,58
P-IGP	0,25	0,10	0,68	0,29
P-PLP	0,46	0,11	0,66	-0,28
P-ALO	0,66	0,34	0,35	0,13
P-KPP	0,37	0,26	0,61	0,14
P-EZO	0,13	0,15	0,80*	0,03
P-PVK	0,78*	0,19	0,16	0,05
P-ALP	0,59	0,15	0,45	0,08
P-ROT	0,81*	0,03	0,14	0,21
P-PAP	0,53	-0,15	0,09	0,57

Source: Author

Factor 1, which is called "*Quality and Sustainability of the Tourism Offer*" with an Eigenvalue = 5.49, includes variables related to the perception of the importance of high quality of the offer (P-PVK=0.78*) and sustainable development of the tourism offer over time (P-ROT=0.81*). The emphasis is on strategic thinking about long-term sustainability and market competitiveness, with service quality and stable growth of the tourism offer representing key elements in the development of rural tourism. This factor may indicate the awareness of stakeholders that quality and sustainability are not only desirable, but also necessary for adapting to climate change, conserving resources and ensuring business continuity. In addition to market orientation, the factor also reflects the acceptance of sustainability as a fundamental development strategy.

Factor 2, called "*Perception of climate threats*" with an Eigenvalue = 1.39, includes variables related to awareness of the problem and dynamics of climate change (P-UKP=0.82*) and the impact of extreme summer temperatures on tourism demand (P-VLT=0.84*). The emphasis is on the perception of risks and threats that climate change poses to business, especially in the context of weather extremes that can negatively affect the seasonality and attractiveness of the destination. This factor reflects the general awareness and concern of respondents about the potential negative consequences of climate change on their activities.

Factor 3, called "*Environmental Awareness*" with Eigenvalue = 1.18, includes the variable of environmental and climate change education for business (P-EZO=0.80*). The emphasis is on the need for knowledge, information and education as a tool for adaptation and sustainable management. Although it includes one variable with a very high loading, this factor emphasizes the importance of the personal and professional responsibility of stakeholders to understand and act in accordance with the challenges of climate change..

Factor 4, called "*Climate conditions as a motivation for tourists*" with an Eigenvalue = 1.01, includes a variable related to climate as a factor in the choice of

destination by tourists (P-STK=0.75*). The emphasis is on the role of climate as a market motive, i.e. its function in shaping tourist preferences. This factor reflects the perception of respondents that climate conditions directly affect the competitiveness of the offer and the attractiveness of the destination in the eyes of tourists.

Based on these four factors, it can be concluded that the perceptions of private sector stakeholders encompass multiple interrelated dimensions that include market orientation, awareness of climate risks, the need for education, and understanding of climate conditions as an economic resource. The structure of the factors shows that the private sector does not perceive climate change solely as an environmental problem, but integrates it into business, development, and market strategies. This confirms the complexity and multi-layered approach to climate challenges, but also the existence of potential for proactive action and adaptation within the rural tourism sector.

CONCLUSION AND RECOMMENDATIONS FOR FURTHER RESEARCH

Climate change poses a major challenge for the tourism industry, as it alters travel conditions, reduces the attractiveness of certain destinations and affects the economic aspects of tourism. However, at the same time, increased awareness of sustainability and adaptation can open up new opportunities for the development of sustainable tourism that respects the environment and contributes to the fight against climate change. Tourism must adapt its strategies to ensure long-term sustainability and maintain its attractiveness in the light of climate change. The research showed greater uniformity of responses among public sector respondents, in contrast to more pronounced variability of attitudes within the private sector.

The above differences may point to several important aspects, they may reflect a stronger institutional awareness and a more formal orientation towards climate change and sustainable development issues, possibly driven by strategies, policies or programmes implemented at the level of public bodies and organisations. On the other hand, lower mean values in the private sector could indicate different levels of awareness, experience or perception of the importance of certain aspects of climate change among entrepreneurs, which may depend on their immediate business context. The higher standard deviation in the private sector suggests diversity in experiences and attitudes, which may be the result of a wider range of activities, differences in the size and resources of companies, as well as the degree of direct exposure to climate impacts. In contrast, lower variability in the public sector may indicate a higher degree of alignment of attitudes, which may be a consequence of shared institutional priorities, professional networking and the availability of relevant information through public channels. Also, in the part related to the private sector, a factor analysis was conducted, and it can be concluded that the perceptions of stakeholders from the private sector encompass several interconnected dimensions that include market orientation, awareness of climate risks, the need for education and understanding of climate conditions as an economic resource. The factor structure shows that the private sector does not perceive climate change exclusively as an environmental problem, but integrates it into business, development and market strategies. This confirms the complexity and multi-layered approach to climate challenges, but also the existence of potential for proactive action and adaptation within the rural tourism sector. The European Union (EU) recognises the importance of addressing the challenges that climate change pos-

es to rural areas. As rural communities make up a significant part of the European economy, particularly in sectors such as agriculture, forestry and tourism, the EU has developed a range of strategies, policies and financial mechanisms to help these areas adapt to climate change. Back in 2018, in their article, Kandžija et al. (2018) concluded that EU membership had a positive impact on the development of Croatian tourism, but they highlighted the need for further reforms and quality improvements to ensure a competitive position in the global market, which is still valid today (Kandžija, Tomljanović, & Smolković, 2018).

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