DEPOPULATION OF COASTAL RURAL LITHUANIA: DO REGIONAL PARKS STABILISE THE SITUATION?

D. Verkulevičiūtė-Kriukienė
A. Bučienė
E. Čepienė

Klaipėda University
S. Nėries g. 5, Klaipėda, LT– 92227, Lithuania

Received 27 December 2020
doi: 10.5922/2079-8555-2021-2-5

Regional parks in Lithuania preserve the most valuable physical and cultural components of the landscape, NATURA 2000 habitats, etc. Usually, they are located in natural or semi-natural landscapes of rural areas. These territories, however, have a higher depopulation rate than urbanised districts. Still, conservation priority areas were expected to attract young families as permanent residents and make their population more stable. This study aims to investigate changes in the rural population in three regional parks of the Klaipėda county to determine the number of abandoned villages (with 0 residents) and vanishing ones (with a population < 5), as compared to territories with no conservation regime. The article examines migration as one of the determinants of depopulation. Analysis of national and local statistics, institutional documents, and structured interviews revealed that the conservation regime applied in regional parks did not necessarily encourage local people to stay or newcomers to arrive. Proximity to the sea and towns with developed social infrastructure remains a priority when looking for a residence in the countryside.

Keywords:
depopulation, disappeared villages, rural population, regional parks, conservation priority

Introduction

Depopulation is caused by socio-economic, political, environmental, cultural, and other factors, which affect the population replacement rate and may deprive once inhabited areas of their residents. This phenomenon has occurred in many regions of the world. The negative impacts of depopulation on rural areas can be subsumed under three categories — those relating to culture, caused by nature, and created by humans [1].

To cite this article: Verkulevičiūtė-Kriukienė, D., Bučienė, A., Čepienė, E. 2021, Depopulation of coastal rural Lithuania: do regional parks stabilise the situation?, *Balt. Reg.*, Vol.13, no 1, p. 90—111.
doi: 10.5922/2079-8555-2021-2-5.

Abandoned areas become overgrown, and nature slowly reclaims them [2]. At the same time, plants or animals whose habitat is dependent on human activities disappear, and deserted material heritage falls into decay. Unpopulated land deteriorates and gradually becomes unusable for agriculture [3]. On a larger scale, the emptying of villages holds back the economic activity and makes the area uncompetitive. Not only changes in agricultural production — intensification/marginalisation, specialisation, and concentration — affect rural landscapes. There are other causes as well. Urbanisation means outmigration from rural regions, whilst rural residence, outdoor recreation, tourism, and nature conservation influence the dynamics of a landscape. The latter four aspects are closely connected to changes in agriculture and forestry [4, 5, 6, 7, 8, 9, 10, 11, 12]. The protected areas of parks can be seen as 'pull' factors in local livelihood in alternative economies [13, 14]. On the one hand, more services and new infrastructure appear in rural areas as recreation, tourism, and environmental protection gain ground. On the other, the local population decreases and becomes sparser; the countryside is emptying. In Lithuania and other Eastern European countries, the latter processes accelerated after the collapse of the Soviet Union in 1991 [15].

Villages of all sizes became fewer after the restoration of Lithuanian independence, although the changes in the internal structure of rural settlements were minimal. The least affected were medium-sized settlements with 201—500 inhabitants. Most larger rural settlements that performed a variety of service functions have survived. Smaller settlements were disappearing [16, 17].

According to data obtained from Lithuanian wards (NUTS-4), there are 133 unpopulated villages in the Northern Lithuanian Biržai district. In Western Lithuania, 14 villages in the Kartena ward of the Kretinga district have disappeared over the past 30 years.[1] Twelve villages ceased to exist in the Šilutė district between 1989 and 2001.[2] In the Žemaičių Naumiestis ward, three settlements, whose population ranged between one and six people in 2011, may disappear in the coming years [18]. In Western Lithuania, the rural population started to decrease much later, in 2000. And, in the other Lithuanian regions, the reduction began soon after the independence [17]. The literature identifies migration due to economic and social reasons as a central factor causing depopulation, which is a self-inducing process. Young, mobile, employable people usually migrate first,

[1] Gyventojų skaičiaus pasiskirstymas pagal teritoriją, amžių ir lytį 2011, Lietuvos Respublikos 2011 metų visuotinio gyventojų ir būstų surašymo rezultatai, 2013, *Lietuvos Statistikos Departamentas*, Vilnius, available at: http://Inform_gyv_sk_pasisk.pdf/ (accessed 22 December 2017) (in Lithuanian).

[2] Šilutės rajono savivaldybės teritorijos bendrasis planas, 2010, *UAB „Statybos strategija"*, available at: http://www.pamarys.lt/publ/Terit_planavimas/Bendrieji/BPL_Silute/2010_T1_1586_BP L_Silute_aisk1.pdf (accessed 5 July 2016) (in Lithuanian).

followed by young families with children. This migration trend precludes population replacement. Disproportions in rural development and settlement structures lead to job shortages and social problems in rural areas. Outmigration has been the hardest on smaller villages in Europe. Some of them have been depopulated, turning into dead or ghost villages [19].

The literature shows that conservation policies may cause wildlife to reclaim human-occupied areas, and this reclamation may adversely influence small and vulnerable human populations. [20, 21]. The socio-economic opportunities provided by protected areas might not make up for the corresponding restrictions [21].

There are 30 regional parks in Lithuania, which comprise 54 per cent of the country's protected areas. All of them are found within cultivated landscapes. Lithuanian regional parks perform many tasks, but their primary function is to preserve the most valuable physical and cultural components of landscapes such as cultural heritage and NATURA 2000 habitats. [22]. Activities that may damage the landscape of regional parks, natural and immovable cultural values, as well as natural recreational resources are prohibited or restricted, and buildings causing visual pollution cannot be built there.[3]

The number of protected areas is growing in Lithuania, much to the discontent of the local population. There are numerous reasons for conflicts between residents and the administration of regional parks: stakeholders are not included in the working groups; residents of protected areas cannot participate in nature protection; there is no unanimity over the restrictions [23]. Another problem is insufficient public awareness. People do not even know about nearby protected areas or what rules apply there. There is a need for better communication with locals and more effective awareness campaigns [24]. Residents of regional parks in Klaipėda County have faced all these problems to a greater or lesser extent.

It has been pointed out that each abandoned village or area needs a tailored intervention strategy [25, 26]. According to Güler and Kâhya (2019), a possible way out is the return of former inhabitants and resettlement with new residents. Part of the population may come from time to time to their second homes in those villages [1].

Although Lithuanian scientists have investigated the geographical aspects of rural extinction [27, 28], there is a gap in the research on how this process occurs in protected areas, particularly regional parks. It was hypothesised that a decrease

[3] Republic of Lithuania Law on Protected Areas, 9 November 1993, No I-301. As last amended on 11 June 2015–No XII-1784, Vilnius, [Law], *Seimas Prezidentas,* available at: https://e-seimas.lrs.lt/portal/legalAct/lt/TAD/cf9f9132b60d11e6a3e9de0fc8d85cd8?jfwid=rivwzvpvg (accessed 8 August 2020) (in Lithuanian).

in the village size and population within regional parks with a conservation regime would be less pronounced compared to other areas. Parks were expected to inspire people, particularly the young, to embrace new services and get satisfaction from working in harmony with nature. This study aims to determine the number of disappeared villages (with zero population) and disappearing ones (with population < 5) by examining three regional parks in Klaipėda County, their settlements, their population, and temporal and spatial changes in these areas. The situation in these territories is compared to that in localities without a conservation regime to reveal the causes of depopulation and produce recommendations for improving regional policies and management.

The study focuses on the villages and rural population of three regional parks, four district municipalities, and their 12 wards in Klaipėda County, as observed in 2001, 2011, and 2019.

Cases and places

The regional parks in question have different geographical features, history, protected objects, population, settlement structure, and businesses. Their common element is hydrography. The Pajūris regional park is located on the Baltic coast; the Nemunas Delta park borders the Curonian Lagoon; the Salantai Regional Park is crisscrossed with rivers and streams. From the administrative point of view, all regional parks belong to Klaipėda County.

The Nemunas Delta regional park is located where the Nemunas River branches into several streams. Bordering the Kaliningrad region of Russia, the park is latticed with rivers, polders, and canals. Over 300 bird species live there. In spring, and sometimes in winter and autumn, most of the park is flooded. Floodplains provide hay and grazing, and the abundance of cheap fodder facilitates livestock farming.

The Pajūris regional park comprises a strip of Lithuania's coast and about 30 km^2 of the Baltic Sea water area. Showcasing the biological diversity of the Baltic Sea, the park boasts unique coastal landscapes, natural and cultural heritage. With its sandy beaches, eroded banks, and pine forests, it is a draw for tourists.

The Salantai regional park is situated in northwestern Lithuania, spanning three district municipalities. Agricultural lands make up 67 per cent of its area. A quarter of the park is forested. A unique feature of the park is boulders dating back to the Last Glacier Period. The territory has been untouched by human hands so far. The park seeks to preserve the landscape, the natural ecosystem, and the cultural heritage of the river valleys and their surroundings (Fig. 1).

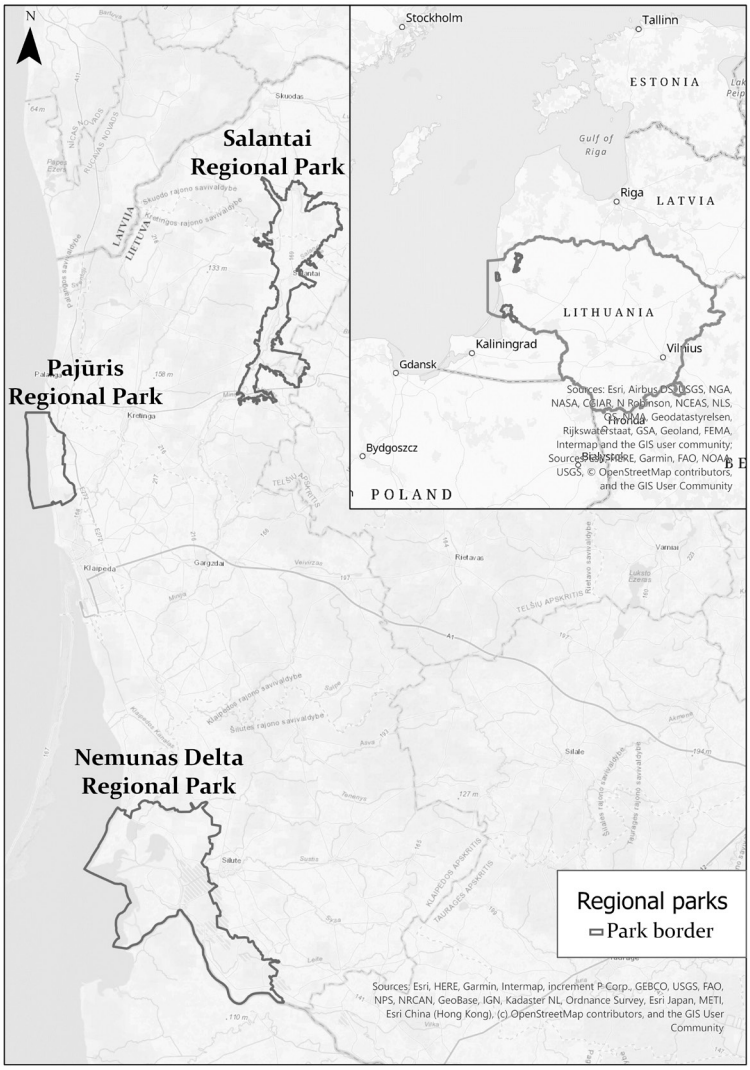

Fig. 1. The location of study sites in Western Lithuania

Source: based on the 2019 ward statistics

Lithuanian rural settlements can be grouped according to their size and population into very small (1—4; 5—9; 10—24; 25—49 people), small (50—99), medium (100—199; 200—499), large (500—1000), and very large (1001+) [28]. Medium-size villages dominate the coastal part of the country [29].

The regional parks differ in area, settlement patterns, and population. The largest by area is the Nemunas Delta regional park and the smallest the Pajūris regional park. The Salantai Regional Park, classified as medium by area, is the most populous and has the highest population density. The largest settlements are found in the Pajūris regional park, followed by Salantai and Nemunas Delta.

There are three townships in the Salantai regional park and one in the Nemunas Delta regional park, whilst most settlements in these areas are villages of different sizes (Table 1).

Table 1

Regional park population characteristics in 2019

Regional parks	Area, km^2	Population	Population density per km^2	Total number of settlements	Average population per settlement	Residential area, % of total area
Pajūris	58.65	1789	30.5	7	255.6	0.9
Salantai	132.65	5526	41.7	29	190.6	4.2
Nemunas Delta	288.7	2293	7.9	26	88.2	1.0

Source: prepared by the authors based on the 2019 ward statistics

According to the historical/architectural features, functions and location, the settlements of regional parks are classified into three groups, as demonstrated in Fig. 2.

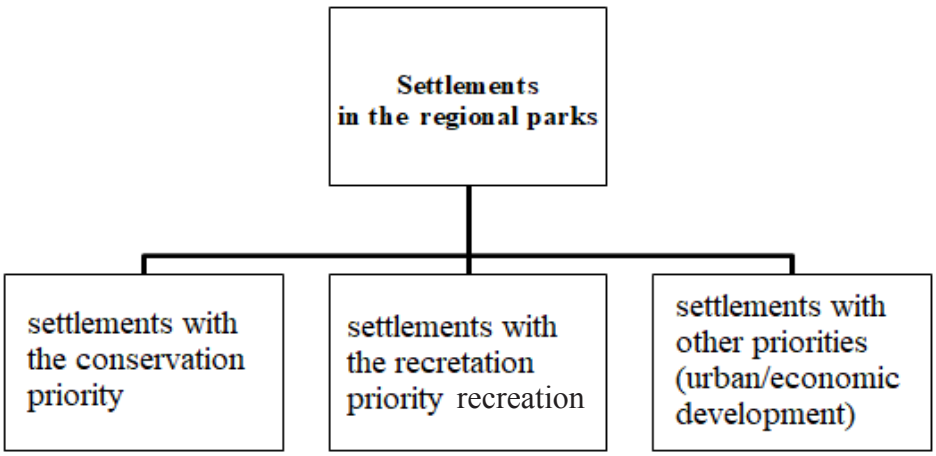

Fig. 2. Lithuanian regional park settlements and their priorities

Source: prepared by the authors, based on[4]

[4] Pajūrio regioninis parkas, 2020, *Tvarkymo planas,* available at: https://www.pajuris.info/index.php?option=com_content&view=article&id=58&Itemid=65&lang=en (accessed 8 August 2020) (in Lithuanian).

The first group includes conservation priority settlements. These towns, townships, villages or their parts are protected as cultural heritage. They are governed based on the architectural principles of conservation, restoration, regeneration, imitation, renovation, and transformation. Depending on which ones are applied, different results can be obtained, ranging from the preservation of authentic objects to the creation of copies, imitations, and hybrids and the launch of innovations. Cultural landscape management has developed spatial requirements for all these objects, and the spatial relations between them have been described.

The second group comprises recreation priority settlements. Most of them are popular locations for summer houses. Local landscape management focuses on ensuring recreational quality.

The third group brings together villages and towns located in the buffer zones of the parks. They have few cultural heritage or nature conservation sites. Yet, these settlements can contribute to the protection of other, more valuable territories. The high priorities are ecological protection, urban and economic development.[5]

Methods

Structural interviews were carried out, and literature, maps, statistical data, and legal documents analyzed. GIS and classification methods were employed to investigate the emptying of villages in the selected regional parks, rural municipalities, and wards. Two semi-structured interviews with 12 ward administrators and landscape specialists from three parks (on the phone and the Internet) were conducted in 2018 and 2020. The twelve wards were Mosėdis, Skuodas, Imbarė, Kartena, Kūlupėnai, Kretingalė, Kintai, Rusnė, Juknaičiai, Šilutė, Saugos, and Salantai. A qualitative analysis of three case studies was performed to explore the causes of depopulation in the localities and the measures proposed by different stakeholders and local authorities to improve the situation.

The findings were mapped using ArcGIS PRO software. The 2001—2019 population change in the wards is shown on a choropleth map: the wards have different colouring depending on the intensity of the process. Settlements were classified by population change (no change, negative change, positive change, no population). Each class was assigned a symbol to mark villages and towns on the map. The distribution of settlements was analysed through the lens of local priorities and population change. Disappeared and disappearing villages were the focus of the analysis.

[5] Pajūrio regioninio parko tvarkymo planas: sprendiniai, 2014, *Valstybinė saugomų teritorijų tarnyba prie Aplinkos ministerijos,* Vilnius (in Lithuanian).

Research results

The number of sparsely populated areas is rapidly increasing in Lithuania. This rise is due to outmigration and low birth rates. The Lithuanian literature identifies three types of sparsely populated areas: (I) having fewer than five inhabitants per sq km; (II) having five-ten residents per sq km; (III) having 10—12.5 people per sq km. Some studies also distinguish territories with fewer than 15 residents per sq km. All areas with a population density of below 12.5 people/km^2 are considered scarcely populated [28].

The average population density of wards located in the regional parks is 63.5 people/km^2. There are two cities in the area, and if the urban population is not factored in, the average population density is as lows as 21.3 people/km^2. Thus, the population density in most local villages is above 12.5 people/km^2. In 2019, there was only one eldership (Notėnai) with a population density below this threshold (9.54 people/km^2).

According to the classification of Lithuanian wards [30], those located in regional parks have different levels of urbanisation. Most of them are non-urban areas lying at a substantial distance from cities and characterised by a declining population and negative natural change. More people leave the areas than arrive there. The Salantai and Skuodas wards (Salantai regional park) are classified as less urbanised areas. Both are a fair distance from Klaipėda and seaside resorts and thus are not attractive to residents. The Šilutė ward is a mixed urban area heavily influenced by the Šilutė district centre. The Kretingalė ward, part of the Pajūris regional park, is a suburban area affected by two cities — the port city of Klaipėda and the resort of Palanga.

The parks protect not only natural sites but also other objects. Amongst them are the ethnographic villages of Minija (Mingė) and Rusnė (former Skirvytėlė) in the Nemunas Delta regional park and ethnographic homesteads, fragments of a manor, and many others places of interest in the Salantai regional park.

The condition of heritage objects depends on the function of a park. In conservation areas, the physical condition of buildings and structures is excellent. They remain authentic and retain their cultural value. At the same time, the physical condition and cultural significance of other objects have deteriorated [31].

The causes of depopulation and the emptying of settlements are many. Firstly, some political events expedited the process: wars, Soviet exile, administrative divisions, emigration, the partisan movement, Soviet collectivisation, etc. Secondly, there were economic causes: industrialisation, land reclamation or melioration, emigration to the EU, internal migration to larger cities, etc. Thirdly, natural phenomena — disasters such as earthquakes, floods, and landslides — had their role to play. Thus, geographic mobility is a consequence of macro-and micro-level factors, one of which is rural-to-urban migration. In Lithuania, like in many other developing nations, this type of migration has evolved into international migra-

tion [32]. When Lithuania announced independence in 1990, 19,541 of the country's population lived in villages, single homesteads, and towns. Yet, according to the 2011 census, only 18,461 Lithuanians lived in such settlements, i. e. a six per cent reduction took place [33].

Depopulation in Lithuania has marked regional differences. In Western Lithuania, where the analysed territories are located, emigration has a more dramatic impact on population decline than natural change [27].

In 2001—2011, the number of rural settlements in Lithuania decreased by 1,638 or 4.13 per cent. In the districts where the regional parks are situated, 46 villages, or 9.4 per cent, disappeared in 2001—2020 (Table 2). This decline intensified in 2001—2011 and reached a plateau.

Table 2

Total number of villages and number of disappeared villages in rural municipalities of Klaipėda County in 2001, 2011 and 2020[6,7]

Municipality	Total number of villages			Number of disappeared villages (with zero population)	
	2001	2011	2020	2001	2011
Skuodas district	171	169	169	5	10
Kretinga district	194	189	189	23	26
Klaipėda district	302	290	284	11	12
Šilutė district	310	288	289	12	15
Total	977	936	931	51	63

The remote Šilutė district in Klaipėda County was affected the most by this negative demographic trend [34]. The number of rural settlements decreased by more than 6 per cent there. Larger rural settlements in Western Lithuania can still sustain their residents, and there are fewer empty villages (without inhabitants) than elsewhere in the country. The population of Klaipėda County districts changed differently. In the suburban Klaipėda district, the number of inhabitants increased, whilst it declined in the rest of the territory [35].

Twelve villages became depopulated in these districts in 2001—2011. This process is still ongoing.

[6] Lietuvos gyventojų ir būstų surašymas 2001 m., Surašymo rezultatai, informacinis pranešimas, 2002, *Lietuvos Statistikos Departamentas*, Vilnius, 5 p. (in Lithuanian).

[7] *Valstybės įmonė Registrų centras* [State Enterprise Centre of Registers], 2020, available at: https://www.registrucentras.lt/ibi_apps/WFServlet? IBIF_webapp=/ibi_apps&IBIC_server=EDASERVE&IBIWF_msgviewer=OFF&IBIF_ex=ar-a1-savivaldybes.fex&CLICKED_ON=&ADM_PAV=Klaip%EBdos%20apskr.&APSKR=3.00&LENT_NR=160.00&PERIODAS_N=0000020009&PERIODAS_I=0&skirt=0&adm_vien=1&dat_laik=1&LAIK=1 (accessed 15 July 2020) (in Lithuanian).

The number of very small villages is growing in the regional parks (Fig. 3). There are seven villages with fewer than five inhabitants in the study area — three in the Nemunas Delta regional park, three in the Salantai regional park, and one in the Pajūris regional park. Twenty-year data show that the number of such villages is likely to increase in the future. Another three villages disappeared in the Salantai regional park.

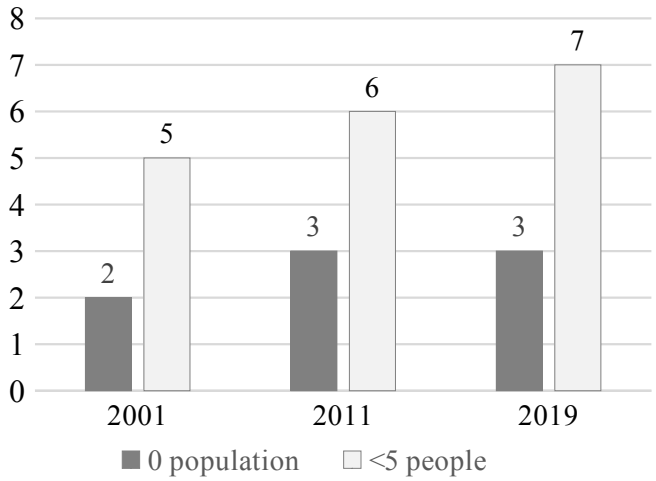

Fig. 3. The number of disappeared villages (zero population) and those with fewer than five people in the three studied regional parks in 2001, 2011 and 2019

Source: prepared by the authors based on the 2019 ward statistics.

Small settlements dominate regional parks. Only in townships does the population exceed 1,000 inhabitants. Although many regional parks gained more people than they lost last year, population decline was the prevailing trend in 2001—2020.

Two factors explain the population change in the regional parks:

1) general demographic trends typical of Lithuania and its Western region;

2) activities and restrictions specific to regional parks.

It is difficult to say which had a more profound impact on the population change in the disappeared villages. These villages are located at the administrative boundaries of municipalities, far from district centres, and thus they are not attractive to residents. In 2019, two of the three villages were part of conservation areas, where the only permitted economic activity is rural tourism. Thus, over time, the development of rural tourism may lead to the repopulation of some disappeared villages.

Changes in the population distribution and migratory attitudes throughout the country and in Western Lithuania are determined by geography. In this case, the decisive geographical factor is proximity to the city of Klaipėda or the seaside. The largest city in Western Lithuania, Klaipėda has a busy port; it is a centre for industry, services, research, and culture, which is appealing to Lithuanians and people from abroad. Like other cities in Lithuania, Klaipėda is going through suburbanisation. Many young families buy suburban houses. Moving away from the coast and Klaipėda causes the population density to decrease. In suburbs, buildings are dispersed, and the population is older than in cities. In Klaipėda County, the demographic situation is better than the national average. In 2019, the demographic old-age coefficient (the number of people aged 65 and older per 100 children under 15) reached 130 in Lithuania, whilst it was 119 in Klaipėda County. Natural change is negative all over Lithuania (–3.8 per 1,000 population), but Klaipėda County performs slightly better than that (–2.2).

The population of the Nemunas Delta regional park decreased by 24.7 per cent from 2001 to 2019. That of the Salantai regional park dropped 19.9 per cent over the period. In only nine settlements, the population increased over the nineteen years — in four villages in the Pajūris regional park, three in the Salantai park, and two in the Nemunas Delta park (Fig. 4).

Unlike the Salantai and Nemunas Delta regional parks, the Pajūris park saw a 3.25-fold population increase in 2001—2019. This park is situated in a coastal area near the port city of Klaipėda. Geographical attractiveness and better job perspectives encourage young families to buy houses in the territory and settle there. Most newcomers are young people looking for a clean, peaceful environment for themselves and their families. In recent years, the number of young people arriving in the suburbs of Klaipėda has been growing. Villages, however, must have good roads and social infrastructure (schools, kindergartens, etc.) to attract young families.

In the Pajūris regional park, villages grew exceptionally fast, whilst their counterparts in the other parks saw an increase by only a few residents (Fig. 4). Overall, the growth of large (over 500 inhabitants) settlements was the most rapid in the territories surrounding the city of Klaipėda; small (up to 9 inhabitants) settlements also grew. Meanwhile, villages with 10—99 inhabitants were losing population from 2001 to 2011 [36].

Fig. 5 shows how the population changed in villages with different priorities over almost 20 years.

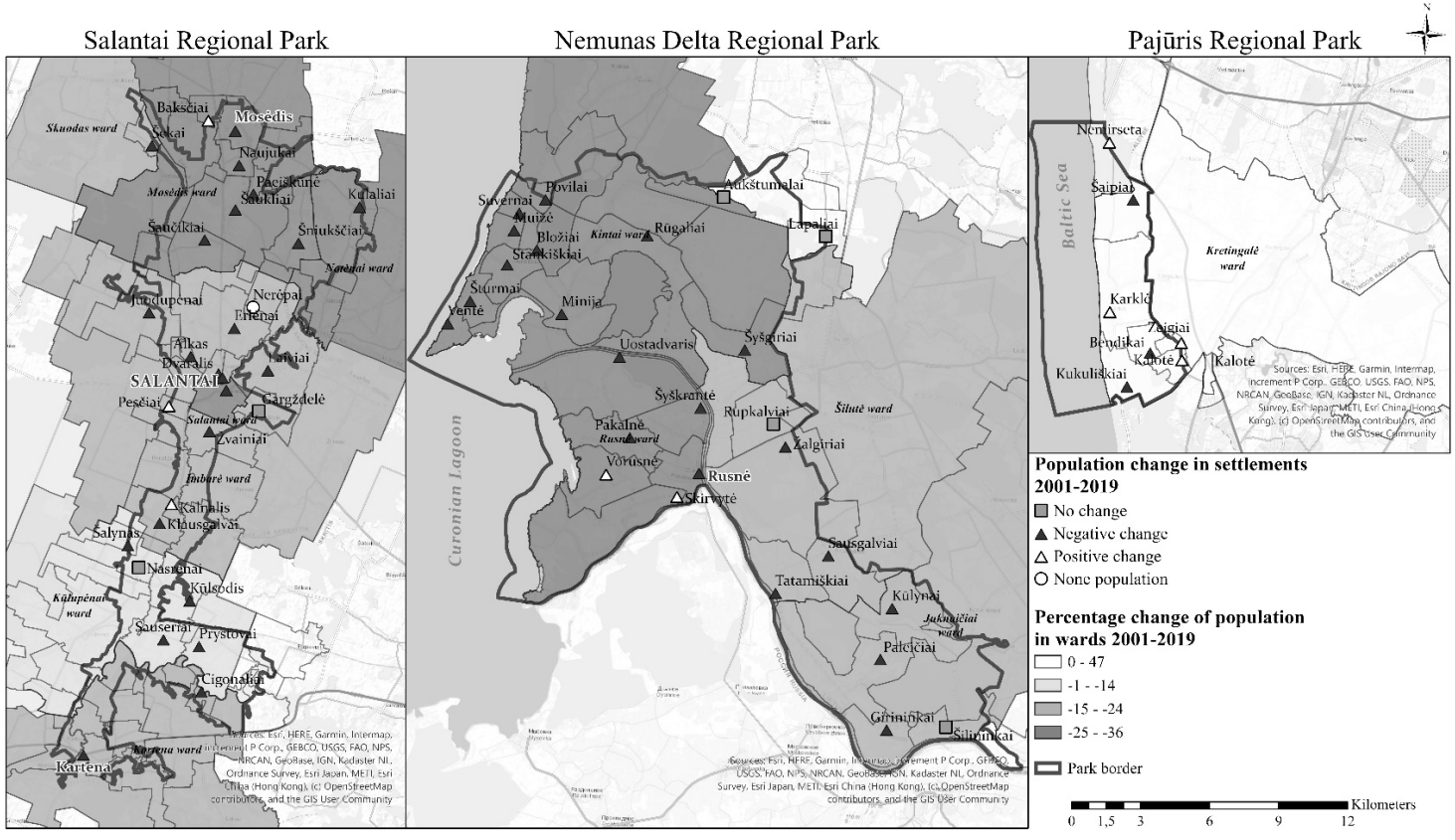

Fig. 4. Spatial changes of population number in the studied regional parks in 2019 as compared with 2001

Source: prepared by the authors based on the 2019 ward statistics.

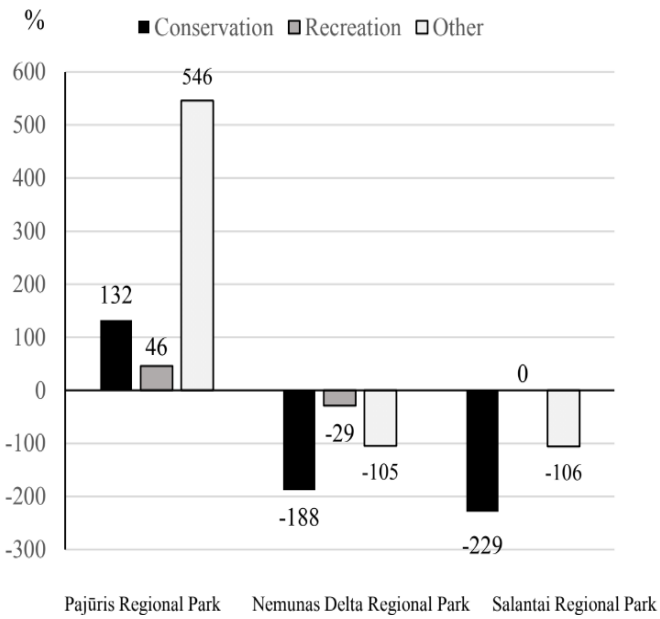

Fig. 5. Population change in 2019 in the villages with different priorities in the examined regional parks,% of the 2001 level

Source: based on 2019 ward statistics, 2001census data, and the grouping of settlements according to their functional priority.

Data show that the average change in the Pajūris regional park was different compared with the two other areas. Its villages with conservation, recreation, and other priorities were gaining population, whilst in conservation priority settlements in the Salantai and Nemunas Delta regional parks, the opposite trend continued. There are recreation priority settlements in the Pajūris and Nemunas Delta parks. These settlements fared well in the latter, witnessing a very modest decrease in the population. Nevertheless, the villages of the studied areas, particularly those of the Salantai regional park, need a boost to the recreation industry. In settlements of the Nemunas Delta and Salantai regional parks with other priorities, the population decline was very similar over the study period.

Although agriculture is the primary field of employment in the Nemunas Delta park (from 30 to 70 per cent of the working-age population in different wards works in this sector), the Salantai regional park boasts the vastest agricultural lands. Agriculture is poorly developed in the Pajūris park — an area covered chiefly with forests and coastal meadows.

Analysis of interviews made it possible to identify some factors as causes or consequences of the situation observed in the regional parks. Fig. 6 demonstrates these factors.

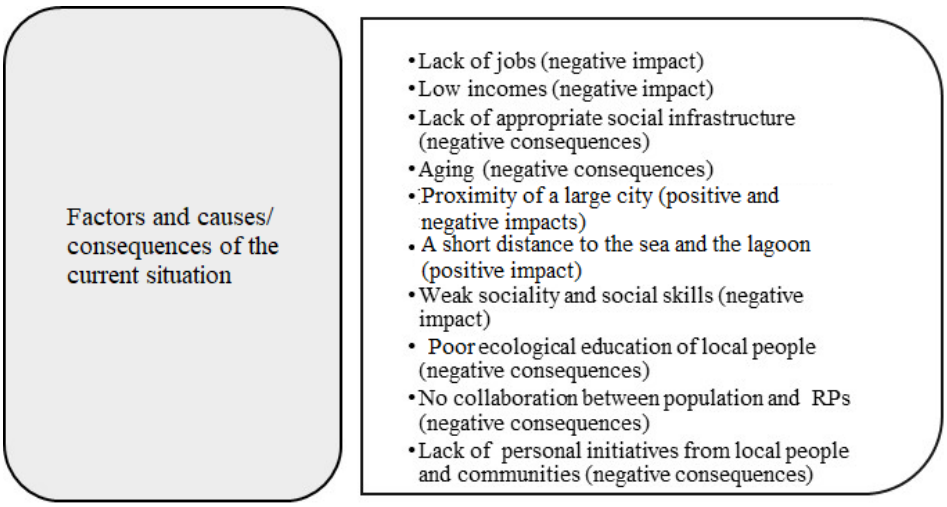

Fig. 6. Factors and causes/consequences of the current population trends in rural settlements in the regional parks

Source: based on the interviews conducted in 2018 and 2020.

The healthiest situation is in the settlements of the Pajūris regional park, where a slight population decline occurred in two villages with the recreation priority and one with the conservation priority. The most substantial increase took place in the other settlements with the same priorities. This situation may be a result of joint actions and effective collaborations between the regional park and the local community in Karklė — one of the largest settlements with conservation and recreation priorities. The about 300-strong village of Nemirseta, populated primarily by young families, has to be more actively involved in the affairs of the regional park to understand its mission and functions. There is a need for environmental education in the other settlements of the Pajūris regional park as well. The park prides itself on sport and recreation routes, including the Litorina nature trail.

The situation in the two other regional parks is more complicated. In the Salantai park, there is hope for more effective communication if the park sets up more initiatives involving residents, schools, and communities.

Although the Nemunas Delta regional park encourages local communities to participate in environmental protection, this collaboration has not been successful. Many residents still do not understand the tasks of the regional park, even in the settlements with the recreation priority.

These parks may benefit from performing an educational function. Cognitive guides have been developed for students, teachers, and visitors of the Nemunas Delta and Salantai regional parks. In particular, there are three outdoor theme-

based lessons available. Visitor centres display expositions for ecological education, and all the parks have educational trails. Nevertheless, improving ecological education requires closer cooperation between regional park administrations and educational institutions.

Twelve ward administrators stressed a need for measures to be taken at the national and municipality/ward levels to improve the current demographic situation in the Klaipėda County regional parks. Research experience leads one to a similar conclusion (Fig. 7).

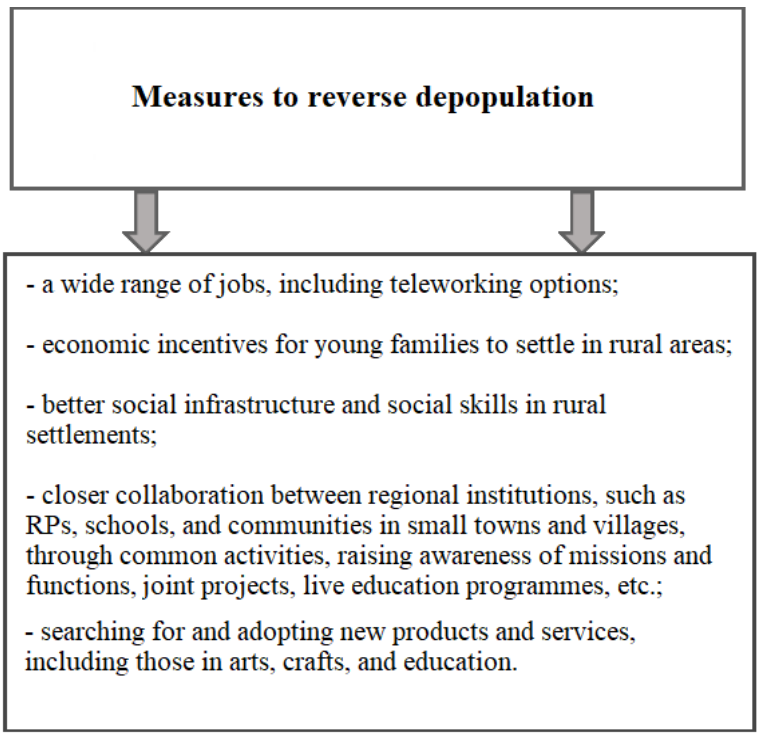

Fig. 7. List of measures to reverse depopulation in the rural wards of the three regional parks

Source: based on the interviews conducted in 2018 and 2020 and research experience.

Sustainable rural landscapes provide complex sustainable services to visitors to gain economic and social benefits for residents. Muller (2002) demonstrates the diversity of agricultural management practices required to ensure the good conservation status of different types of habitats [37]. Organic farming is another success story [38]. There are five organic farms in the regional parks: one organic farm in the Salantai park and four organic farms in the Nemunas Delta park. The Pajūris park[8] has no such farms; a promising local priority is sustainable forestry.

[8] Lietuvos erdvinės informacijos portalas, VĮ „GIS-Centras, available at: http://www.geoportal.lt/lvi/.

Ecotourism is an excellent opportunity for visitors to learn about sustainable practices. Tourists share their experiences and thus contribute to environmental protection and biodiversity conservation [39, 40, 41, 42, 43]. The educational function of protected areas is vital [44]. Protecting the environment should not be the only purpose of regional parks. It is also essential to achieve other goals outlined in the Law on Protected Areas of Lithuania. These are creating conditions for recreation (foremost, cognitive and ecological tourism), developing environmental education, promoting organic farming or sustainable forestry, and other measures aimed at the comprehensive preservation of landscapes and their values. Environmental protection has a more substantial positive impact on local labour markets when business regulations are relaxed [45].

Improving the demographic situation is a complex and resource-intensive process. It should not be the sole responsibility of the national government. Local communities should also have a role in revitalising endangered villages. Burinskienė and Lazauskaitė [46] highlight the importance of informal planning by institutional agents such as village groups, sports clubs, community organization, and others. Such planning includes the improvement of infrastructure and the activation of cultural life. Rural settlements should be evenly distributed across a country or a region, whilst adequate infrastructure will reduce differences between rural and urban areas [47, 48]. Strategic planning demands financial support for local people (tax cuts, benefits or similar measures) [36]. Thus, involving residents in governance will strengthen their attachment to the place and desire to protect nature and increase participation [49].

Discussion and proposals for future research

Comparing two censuses (of 1989 and 2011) suggests an important conclusion: the population of some villages and homesteads is growing. And there are about 130 such settlements in Lithuania [33]. Two settlements, which once had zero population, were repopulated again in the area under study. These are Vorusnė and the Tatamiškiai in the Nemunas Delta regional park.

The chief cause of depopulation is inefficient cooperation between regional parks and local communities or lack thereof. Unfortunately, there are few positive examples of such collaborations, most of them in the Pajūris regional park. Closer cooperation between parks and local communities and joint education and development projects will encourage people, particularly young families, to relocate to parks. Regional park authorities have a central role in reconciling the interests of stakeholders [2]. Further research should be undertaken to investigate the expectations and opinions of locals, particularly the young.

Conclusions

1. Small settlements dominate the regional parks. Most new residents are young people. However, they opt for settlements with developed social infrastructure (kindergartens and schools). Not all townships or villages with a population of more than 100 can boast such institutions.

2. The Pajūris regional park stands out in terms of demography. It is situated in the coastal area near the port city of Klaipėda. Its location and availability of jobs encourage young families to buy homes and settle there, although residential construction is restricted in the park due to the conservation regime. The population of the Pajūris regional park increased 3.25 times in 2001—2019.

3. In the Salantai regional park, disappearing villages cluster near the boundaries of the district. They lie at a distance from the district centre and the seaside and attract few residents. Three villages had disappeared in this park by 2019 compared to 2001. The Salantai park lost more people living in the conservation area than the other regional parks did. Restrictions upon construction and industrial activities may be the cause of the population decline.

4. In the Nemunas Delta regional park, on the one hand, agricultural activities are restricted because of the prevalence of flood meadows. As a result, farmers can keep only limited numbers of livestock. It is not attractive to residents and young people, who are leaving the villages. On the other hand, recreational services developing in the area may contribute to the population increase in the future.

5. Few jobs, low incomes, lack of social infrastructure, and legal restrictions imposed on regional parks are the main factors behind the population decline in many villages. Another problem is the ineffective communication between local communities and the administration of regional parks. Therefore, improving the situation requires a boost to ecological farming, sustainable forestry, and other sustainable activities. It is necessary to involve the staff of regional parks in the activities of wards, organise as many community events as possible, and develop joint projects. The latter may focus on environmental education, the organisation of ecological tours, etc. Economic measures are also needed to motivate the population to stay in the countryside and revitalise depopulated settlements.

Acknowledgement. *We would like to extend our thanks to landscape specialists of Salantai,* Pajūris *and Nemunas Delta Regional Parks and administrators of 12 wards of Klaipėda County (Mosėdis, Kintai, Kretingalė, Rusnė, Imbarė, Juknaičiai, Kartena, Skuodas, Kūlupėnai, Saugos, Salantai, Šilutė) for taking time to fill in our questionnaires and providing us with the most recent statistics on rural settlements and population.*

References

1. Güler, K., Kâhya, Y. 2019, Developing an Approach for Conservation of Abandoned Rural Settlements in Turkey, *ITU A|Z Journal of Faculty of Architecture,* vol. 16, no. 1, p. 97—115, doi: https://doi. org/10.5505/itujfa.2019.48991.

2. Martínez-Abraín, A., Jiménez, J., Jiménez, I., Ferrer, X., Llaneza, L., Ferrer, M., Palomero, G., Ballesteros, F., Galán, P., Oro, D. 2020, Ecological Consequences of Human Depopulation of Rural Areas on Wildlife: A Unifying Perspective, *Biological Conservation,* no. 252. doi: https://doi. org/10.1016/j.biocon.2020.108860.

3. Aleknavičius, P., Aleknavičius, M., Akelaitytė, S. 2014, Lietuvos kaimo gyvenamųjų vietovių pokyčių tyrimai [Research of Changes of Rural Residential areas in Lithuania], *Journal of Architecture and Urbanism*, vol. 38, no. 2, p. 161—172. doi: 10.3846/20297955.2014.924284 (in Lithuanian).

4. Anokhin, A., Kropinova, E. G. 2020, Scientific and Practical Aspects of Organizing week-end Routes in the Natural Environment Using Technologies of Active tourism, *Service and Tourism: Current Challenges*, vol. 14, no. 2, p. 50—63. doi: 10.24411/1995-0411-2020-10205.

5. Bodesmo, M., Pacicco, L., Romano B., Ranfa, A. 2011, The role of environmental and socio-demographic indicators in the analysis of land use changes in a protected area of the Natura 2000 Network: the case study of Lake Trasimeno, Umbria, Central Italy, *Environmental Monitoring and Assessment*, 184. doi:10.1007/s10661-011-2004-z.

6. Brown, D. L., Schafft, K. A. 2011, *Rural People and Communities in the 21st Century: Resilience and Transformation*, Cambridge, Polity, 224 p. doi: https://doi. org/10.1093/sf/sos042.

7. Karlsson, I., Rydén, L., Sepp, K. 2012, Introduction. In: Karlsson, I., Rydén, L. *Rural Development and Land Use*, The Baltic University Programme, Uppsala University, p. 11—20, available at: http://www.diva-portal.org/smash/get/diva2:603529/FULLTEXT01.pdf (accessed 25 January 2021).

8. Pedroli, B., Correia, T. P., Primdahl, J. 2016, Challenges for a Shared European Countryside of Uncertain Future. Towards a Modern Community-based Landscape Perspective, *Landscape Research*, vol. 41, no. 4, p. 450—460. doi: 10.1080/01426397.2016.1156072.

9. Primdahl, J., Andersen, E., Swaffield, S., Kristensen, L. 2013, Intersecting Dynamics of Agricultural Structural Change and Urbanisation within European Rural Landscapes: Change Patterns and Policy Implications, *Landscape Research,* no. 38, p. 799—817.

10. van Vliet, J., de Groot, H. L. F., Rietveld, P., Verburg, P. H. 2015, Manifestations and Underlying Drivers of Agricultural Land use Change in Europe, *Landscape and Urban Planning,* no. 133, p. 24—36. doi: 10.1016/j. landurbplan.2014.09.001.

11. Woods, M. 2011, *Rural geography: Processes, responses and experiences in rural restructuring*, SAGE Publications Ltd. doi: https://www.doi.org/10.4135/9781446216415.

12. Zariņa, A., Vinogradovs, I., Šķiņķis, P. 2018, Towards (dis)continuity of Agricultural Wetlands: Latvia's Polder Landscapes after Soviet Productivism, *Landscape Research,* vol. 43, no. 3, p. 455—469. doi: 10.1080/01426397.2017.1316367.

13. Hoffman, D. M. 2017, Parks, Proxies, and People Ideology, Epistemology, and the Measurement of Human Population Growth on Protected Area Edges. Environment and Society, *Advances in Research,* vol. 8, no 1., p. 161—179. doi: 10.3167/ares.2017.080108.

14. Joppa, L. 2012, Population Change in and around Protected Areas, *Journal of Ecological Anthropology*, vol. 15, no. 1, p. 58—64. doi: http://dx.doi. org/10.5038/2162-4593.15.1.4.

15. Anokhin, A., Kropinova, E. 2020, Principles of Sustainable Development for Rural Tourism Synergy, *E3S Web of Conferences*, vol. 208, no. 05017. doi: https://doi. org/10.1051/e3sconf/202020805017.

16. Kriaučiūnas, E. 2013, Lietuvos kaimo gyvenviečių tinklo kaitos ypatumai 1989—2011 metais, *Kaimo raidos kryptys žinių visuomenėje* [The Particularities of Lithuanian Rural Settlement Network Alternations during the Period 1989—2011. Trends of Rural Development in the Knowledge Society], no. 1, p. 53—60, available at: https://talpykla. elaba. lt/elaba-fedora/objects/elaba:6228361/datastreams/MAIN/content (accessed 7 August 2020) (in Lithuanian).

17. Bučienė, A., Gadal, S., Galinienė, J., Gailius, V. 2017, The geographic-retrospective analysis of landscape in Žemaičių Naumiestis ward, *Geologija Geografija* [Geology Geography], vol. 3, no. 1, p. 25—36.

18. Csapó, T., Balogh, A. 2011, *Development of the Settlement Network in the Central European Countries: Past, Present, and Future*, Springer Science & Business Media, 105 p.

19. Paniagua, A. 2018, Local people unprotected by protected (depopulated) natural areas: the case of Sierra Norte Guadalajara, Spain, *GeoJournal*, no. 83, p. 993—1004. doi: https://doi. org/10.1007/s10708-017-9813-8.

20. Rodríguez-Rodríguez, D., Larrubia, R., Sinoga, J. D. 2021, Are Protected Areas Good for the Human Species? Effects of Protected Areas on Rural Depopulation in Spain, *Science of the Total Environment*, vol. 763, p. 1—9. doi: https://doi. org/10.1016/j. scitotenv.2020.144399.

21. Baškytė, R. 2006, Saugomų teritorijų būklė ir jų ateitis, *Lietuvos saugomos teritorijos* [Status and future of protected territories, The protected territories of Lithuania], Vilnius, p. 320—325 (in Lithuanian).

22. Juknevičiūtė, A., Mierauskas, P. 2012, Saugomų teritorijų plėtra Lietuvoje: valdymo iššūkiai, *Darnaus vystymosi strategija ir praktika* [Development of protected areas in Lithuania: management challenges. Sustainable development strategy and practice], no. 1 (6), p. 78—92, available at: https://www.mruni.eu/upload/iblock/9f9/006_jukneviciute_mierauskas. pdf (accessed 8 August 2020) (in Lithuanian).

23. Mierauskas, P. 2010, Suinteresuotų asmenų dalyvavimas Lietuvos saugomų teritorijų valdyme, *Socialinių mokslų studijos* [Stakeholder Participation in the Management of Lithuanian Protected Areas, Societal studies], no. 3 (7). p. 125—143, available at: https://www.mruni.eu/upload/iblock/3f9/8mierauskas.pdf (accessed 8 August 2020) (in Lithuanian).

24. Filipe, M., de Mascarenhas, J. M. 2011, Abandoned Villages and Related Geographic and Landscape Context: Guidelines to Natural and Cultural Heritage Conservation and Multifunctional Valorization, *European Countryside*, vol. 3, no. 1, p. 21—45. doi: https://doi. org/10.2478/v10091-011-0002-3.

25. Jaszczak, A., Kristianova, K., Vaznonienė, G., Žukovskis, J. 2018, Phenomenon of Abandoned Villages and its Impact on Transformation of Rural Landscapes, *Management Theory and Studies for Rural Business and Infrastructure Development*, vol. 40, no. 4, p. 467—480. doi: 10.15544/mts.2018.43.

26. Daugirdas, V., Burneika, D., Kriaučiūnas E., Ribokas G., Stanaitis A., Ubarevičienė R. 2013, *Lietuvos retai apgyvendintos teritorijos* [Sparsely populated territories in Lithuania], Vilnius (in Lithuanian).

27. Kriaučiūnas, E., Ribokas, G. 2012, Šiaulių apskrities retai apgyvendintų teritorijų pokyčiai ir demografinės raidos ypatumai, *Ekonomika ir vadyba: aktualijos ir perspektyvos* [Peculiarities of changes and demographic development of sparsely populated territories in Šiauliai county. Economics and Management: Current Issues and Perspectives], no. 3 (27), p. 135—143, available at: https://vb.mab.lt/object/elaba:6227695/ (accessed 8 August 2020) (in Lithuanian).

28. Vaitekūnas, S., Čepienė, E. 2014, Lietuvos kaimų sistema: koncepcija, skaičius, dydis, tankumas, kaita, Tiltai [Lithuanian rural settlements system: conception, the number, size, density, location, changes, *Bridges*, no. 2, p. 53—74. doi: http://dx.doi.org/10.15181/tbb.v67i2.846 (in Lithuanian).

29. Baranauskienė, V. 2019, Kaimiškų teritorijų identifikavimo problema: Lietuvos seniūnijų atvejis, *Geografijos metraštis* [The Problem of Identification of Rural Areas: The Case of Lithuanian Elderships, The Geographical Yearbook], no. 52, p. 5—72. doi: https://doi.org/10.5200/GM.2019.4 (in Lithuanian).

30. Mlinkauskienė, A. 2010, Saugomų kaimo gyvenamųjų vietovių būklės pokyčiai regioniniuose parkuose. In: *IV Lietuvos urbanistinis forumas, Urbanistinė drieka: miesto ir kaimo sandūra* [Changes in the condition of protected rural settlements in regional parks. 4th Lithuanian Urban Forum. Urban sprawl: the junction of urban and rural], p. 46—54, available at: http://dpakademija.lt/stor/uploads/2013/07/2010-UF-leidinys.pdf (accessed 7 August 2020) (in Lithuanian).

31. Carter, G. L. 2016, *Population and society: an introduction,* Cambridge, UK, Polity Press, p. 179—190.

32. Kavoliutė, F. 2017, *Lietuvos gyvenamųjų vietovių vardų kaitos apžvalga (XX a. II pusė), ataskaita,* Vilniaus Universitetas, Geomokslų institutas, Geografijos ir kraštotvarkos katedra, Vilnius [Overview of change of names of residential settlements of Lithuania in the II part of XX c., report, Department of Geography and Landscape management, Institute of Geosciences, Vilnius university], 42 p. (in Lithuanian).

33. Verkulevičiūtė-Kriukienė, D., Bučienė, A., Beteika, L. 2017, Changes in rural landscape status, functions and human factor: the case of transboundary Nemunas delta region, *Area*, Royal Geographical Society (with the Institute of British Geographers). doi: https://doi.org/10.1111/area.12383.

34. Butkutė, J. 2014, Kaimo gyvenviečių ir gyventojų skaičiaus, lytinės sudėties kaita 2001—2011 metais, *Geografija ir edukacija: mokslo almanachas* [The variation of rural settlements and the number of residents as well as their composition by gender in 2001—2011, Geography and education: science almanac], no. 2, Vilnius, Lietuvos edukologijos universiteto leidykla, p. 21—34 (in Lithuanian).

35. Jurevičienė, J. 2010, Kaimo kultūrinio kraštovaizdžio vertė, *Urbanistika ir architektūra* [Cultural Value of Agrarian Landscape, Town Planning and Architecture], vol. 34. no. 3, p. 113—119. doi: https://doi.org/10.3846/tpa.2010.11 (in Lithuanian).

36. Muller, S. 2002, Appropriate Agricultural Management Practices Required to Ensure Conservation, Biodiversity of Environmentally Sensitive Grassland Sites Designated under Natura 2000, *Agriculture, Agriculture Ecosystems & Environment*, no. 89, p. 261—266, available at: https://www.sciencedirect.com/science/article/abs/pii/S0167880901002353 (accessed 25 August 2021).

37. Halada, L., Evans, D., Carlos Romão, C., Petersen, J-E. 2011, Which Habitats of European Importance Depend on Agricultural Practices? *Biodiversity and Conservation,* no. 20, p. 2365—2378. doi: 10.1007/s10531-011-9989-z.

38. Lanier, P. 2014, The positive impacts of ecotourism in protected areas*, WIT Transactions on Ecology and The Environment*, no. 187, p. 199—209. doi:10.2495/ST140161.

39. Minciu, R., Pădurean, M., Popescu, D., Hornoiu, R. 2012, Demand for Vacations / Travel in Protected Areas — Dimension of Tourists' Ecological Behavior, *Amfiteatru Economic Journal*, no. 14 (31), p. 99—113, available at: https://www.econstor.eu/bitstream/10419/168749/1/aej-v14-i31-p099.pdf (accessed 26 January 2021).

40. Ristića, D., Vukoičića, D., Milinčić, M. 2019, Tourism and sustainable development of rural settlements in protected areas — Example NP Kopaonik (Serbia), *Land Use Policy*, no. 89, 104231, available at: https://doi. org/10.1016/j.landusepol.2019.104231 (accessed 30 March 2021).

41. Stronza, A. L., Hunt, C. A., Fitzgerald, L. A. 2019, Ecotourism for Conservation?, *Annual Review of Environment and Resources*, no. 44, p. 229—5. doi: https://doi.org/10.1146/annurev-environ-101718-033046.

42. Zolfani, S. H., Sedaghat, M., Maknoon, R., Zavadskas, E. K. 2015, Sustainable tourism: a comprehensive literature review on frameworks and applications, *Economic Research-Ekonomska Istraživanja*, vol. 28, no. 1, p. 1—30. doi: https://doi.org/10.1080/1331677X.2014.995895.

43. Abduganiev, O. I., Abdurakhmanov, G. Z. 2020, Ecological Education for the Purposes Sustainable Development, *The American Journal of Social Science and Education Innovations*, no. 2 (8), p. 280—284. doi: https://doi.org/10.37547/tajssei/Volume02Issue08-45.

44. Byström, J., Müller, D. K. 2014, Tourism labor market impacts of national parks. The case of Swedish Lapland, *Zeitschrift für Wirtschaftsgeographie*, vol. 58, no. 2—3, p. 115—126.

45. Syssner, J., Meijer, M. 2017, Informal Planning in Depopulating Rural Areas. A Resource-based View on Informal Planning Practices, *European Countryside*, vol. 9, no. 3, p. 458—472. doi: 10.1515/euco-2017-0027.

46. Burinskienė, M., Lazauskaitė, D. 2010, Mažų miestelių, bažnytkaimių, kaimo gyvenviečių perspektyvos. In: *IV Lietuvos urbanistinis forumas, Urbanistinė drieka: miesto ir kaimo sandūra* [Perspectives of small towns, church villages and rural settlements. 4th Lithuanian Urban Forum. Urban sprawl: the junction of urban and rural], p. 34—39, available at: http://dpakademija.lt/stor/uploads/2013/07/2010-UF-leidinys. pdf (accessed 7 August 2020) (in Lithuanian).

47. Mickovic, B., Mijanovic, D., Spalevic, V., Skataric, G., Dudic, B. 2020, Contribution to the Analysis of Depopulation in Rural Areas of the Balkans: Case Study of the Municipality of Niksic, Montenegro, *Sustainability,* no. 12(8), p. 1—23. doi: 10.3390/su12083328.

48. Mehnen, N., Mose, I., Strijker, D. 2013, Governance and Sense of Place: Half a Century of a German Nature Park, *Environmental Policy and Governance*, no. 23, p. 46—62. doi: https://doi. org/10.1002/eet.1592.

The authors

Dr Daiva Verkulevičiūtė-Kriukienė, Klaipėda University, Faculty of Social Sciences and Humanities, Lithuania.

E-mail: verkuleviciute.daiva@gmail.com

https://orcid.org/0000-0003-0675-1879

Prof. Dr Angelija Bučienė, Klaipėda University, Faculty of Social Sciences and Humanities, Lithuania.

E-mail: angelijab@gmail. com

https://orcid.org/0000-0001-5700-5820

Erika Čepienė, PhD student, Klaipėda University, Faculty of Social Sciences and Humanities, Lithuania.

E-mail: erikacepiene@gmail. com

https://orcid.org/0000-0002-1536-2595