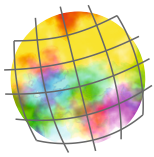
FOLIA GEOGRAPHICA

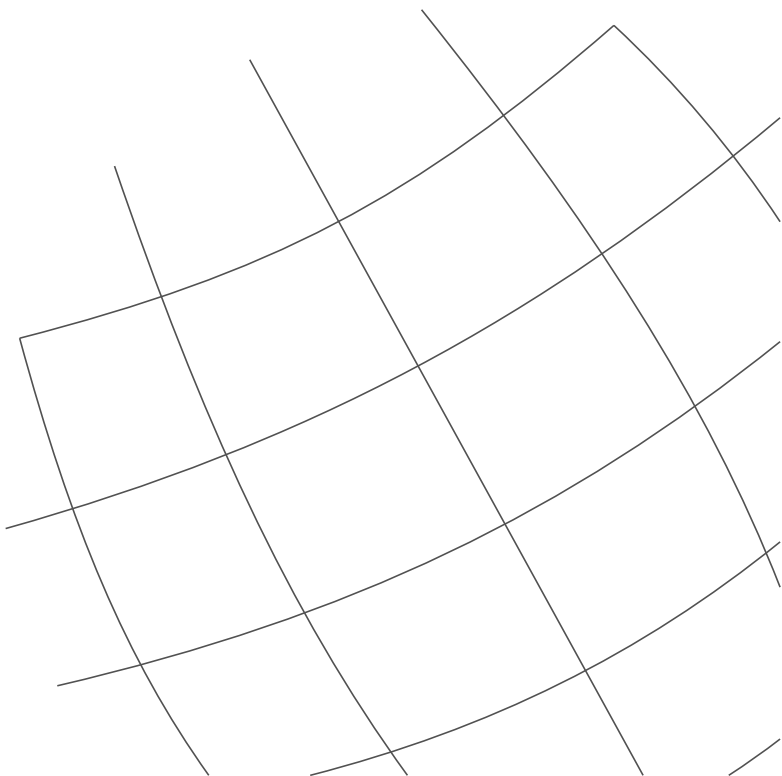
INTERNATIONAL SCIENTIFIC JOURNAL

ISSN 1336-6157 (hard copy), ISSN 2454-1001 (online)



FOLIA GEOGRAPHICA

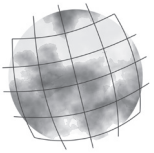
Volume 62, 2020, No. 2



FOLIA GEOGRAPHICA

INTERNATIONAL SCIENTIFIC JOURNAL

ISSN 1336-6157 (hard copy), ISSN 2454-1001 (online)



FOLIA GEOGRAPHICA

Volume 62, 2020, No. 2

VYDAVATEĽSTVO PREŠOVSKEJ UNIVERZITY

International scientific journal for theory, research and practice
of geography and related disciplines

FOLIA GEOGRAPHICA

Volume 62, 2020, No. 2

This journal is available online:

http://www.foliageographica.sk

Publisher:

University of Prešov, Ul. 17. novembra 15, 080 01 Prešov, Slovakia, IČO 17 070 775

ISSN 1336-6157 (hard copy)
ISSN 2454-1001 (online)

EV 4949/14

CONTENT

FOLIA GEOGRAPHICA • ISSN 1336-6157 (hard copy) • ISSN 2454-1001 (online)

APPLICATION OF CLUSTER ANALYSIS IN URBAN MORPHOLOGY RESEARCH. THE EXAMPLE OF INDUSTRIAL PLOTS IN ŁÓDŹ (POLAND)

Iwona JAŻDŻEWSKA [A*], Joanna KOTLICKA [B]

Received: June 19, 2020 | Revised: August 21, 2020 | Accepted: September 13, 2020
Paper No. 20-62/2-563

Abstract
The article presents the taxonomic method of cluster analysis used to identify morphological types of industrial areas. The authors examined three features of the industrial plot in several periods (Po - total area, K - shape index, Pz - built-up area [%]) and used the Ward classification method, which allowed them to identify the morphological types of industrial plots in Łódź, as well as certain representative types for individual periods of study. The development and position of the city is related to the development of the textile industry, built in Łódź from the 1820s. Initially a centre of crafts, it quickly transformed into a cotton and wool production centre in the mid-19th century. In this process, many distinguishing features were created, such as the spatial layout, industrial areas in the morphological and functional structure of the city, industrial and residential architecture. The collapse of the industry took place during the political transformation in Poland after 1989. These studies are among the most traditional in urban studies, focusing on the spatial traces of the city and are combined with statistical methods rarely found in historical research. The study included 10% of the overall number of industrial plots in 1986 in Łódź. The sample was selected intentionally; it consisted of the oldest plots, established in the period of the dynamic development of industrial areas in the late 19th and early 20th centuries. The applied taxonomic method allowed the authors to create a model for the transformation of industrial plots in Łódź (1896-1986).

Key words
Cluster analysis, urban morphology, industrial plots, Łódź, Poland.

INTRODUCTION

Morphological urban studies have often been discussed in geographical literature, especially regarding geographical-historical settlement studies. Research based on historical and geographical studies includes plan analysis with metrological aspects. The precursor of morphometric studies is Conzen, who started to study German and English cities in the 1920s. These were classical studies that, as Whitehand claims, were strongly influenced by Schlüter, Geisler and Fritz. (Whitehand, 2001) Conzen's work about Newcastle (Conzen, 1962) features all the stages of

A* University of Łódź, Faculty of Geographical Science, Łodź, Poland
iwona.jazdzewska@uni.lodz.pl (corresponding author)
B University of Łódź, Faculty of Geographical Science, Łodź, Poland

a classical morphological analysis, from the study of land topography, through the chronological reconstruction of the urban tissue growth and types of buildings, to drawing maps of morphogenetic units. Conzen's analysis (Conzen, 1960) comprised data spanning over 200 years, was descriptive and, most importantly, included novel aspects of urban morphology research, such as recreating the growth of the built-up area in the oldest part of the city. His examination of land coverage density and the patterns of changes made it possible to identify individual phases of development, the order in which they occurred and the land coverage saturation in individual phases. The process was referred to as an urban cycle. Moreover, (Conzen, 1962) described the reconstruction of urban blocks of tenement housing and the changes in the development of the outskirts of a medieval city. The study of development dynamics inspired many urban studies, for cities in Europe: British (Larkham, 2006), French (Darin, 1998), Italian (Marzot, 2002), German (Hofmeister, 2004), Polish (Koter & Kulesza, 1999), Slovak (Matlovič, 1995), Turkish (Ünlü & Baş, 2017), as well as elsewhere (Larkham & Conzen, 2014), and thus we refer to them as the Conzenian trend in urban morphology studies (Whitehand, 2001).

Mathematical methods have been applied for classification purposes for a hundred years and were first appreciated in anthropology (Czekanowski, 1911) or biology (Fisher, 1936). The 1960s brought significant developments, particularly in the field of cluster analysis, when it has been shown to be potentially very useful in different sciences for grouping similar objects. The similarity criterion in cluster analysis may be mathematically defined and has been described by R. R. Sokal and C. D. Michener. (Sokal & Michener, 1958). Mathematical methods have been more and more frequently used in recent geographical-historical studies. Researchers use simple statistical methods, as well as graph (Trigueiro & Soares de Medeiros, 2007), fractal (Batty & Longley, 1994) cluster analysis (Grimshaw et al., 1970) and other frameworks of spatial analysis, including GIS (Peeters & Etzion, 2012). They allow them to describe phenomena and point to certain transformation processes, typical of particular areas and common in historical studies.

OBJECTIVES

The main aim of this article is to present the potential of hierarchical clustering in urban morphology studies, especially for tracing the transformations of urban industrial plots of land. Industrial plots are a particular type of urban plots, as they undergo development processes leading to the transformations of urban morphological units.

For the purpose of studying the morphology of industrial plots, the authors chose Łódź, a Polish city which owes its development to the industrial function. Between 1815 and 1989, textile manufacturing was the predominant type of industry in the city. After 1989, following the political and economic transformation

in Poland, the textile industry declined, and many industrial areas changed their functions. Therefore, the studied plots had to be carefully chosen – they performed industrial functions from the moment they were established until 1986.

THE STUDY AREA

The city of Łódź has been chosen as the area of study. Located in central Poland, it is currently the third largest city in the country (772 thousand inhabitants in 2015), the capital of the voivodeship, as well as a big economic, academic and cultural centre. It dates back to the Middle Ages, but the real development and position of the city is related to the progress in textile industry, built in Łódź since the 1820s. It was initially a handicraft centre, which underwent rapid transformation into a cotton and wool manufacturing centre in mid-19th century. This dynamic development can be seen, among others, in population growth, from 18.6 thousand in 1840 to 321 thousand in 1900 and 500.5 thousand in 1914. This process helped form many distinguishing characteristics, such as the spatial layout, industrial areas in the morphological and functional structure of the city, industrial and residential architecture. Industrial areas could be found at all stages of development. They emerged before the first craftsmen, industrialists and workers came, as craft settlements were first planned, then populated with willing persons. For nearly 200 years, the industrial areas were undergoing changes, with many of them serving their industrial function in the same location until the 1980s, when the textile industry broke and collapsed due to political and economic transformations. Currently, there are textile factories in Łódź manufacturing cotton, flaxen or wool fabrics. Only one plant, Ariadna Thread Factory SA, has been continuously operating since 1897.

The layout and features of the first industrial plots in Łódź

The first industrial plots in Łódź were established in craft settlement. Those settlements emerged in the 1820s in areas that were prepared and regulated under the wide-spread industrialisation effort in Poland. During this time, craft settlements of Nowe Miasto and Osada Łódka were founded in the outskirts of a small agricultural town of Łódź, with manual production of wool and cotton fabrics. These settlements were located in free and undeveloped areas (agricultural or forest), and their planning followed the rules of founding craft settlements at the time. Osada Łódka consisted of several colonies: weavers', Spinnlinie, Buschlinie, Ślązaki and Kąty. Artisans living in the colonies cultivated and processed flax and wove cloth. Individual crafts and agricultural parcels in the colonies varied in size, depending on the tasks assigned to a given colony. The weavers' parcels were smaller, while flax growers needed bigger plots. All were rectangular. In the weavers' colony, the plots were 0.56 ha, with dimensions of 291 m x 21.6 m or 19.2 m, the wool weavers'

garden were 0.75 ha, with dimensions of 216 m x 34.6 m. In flax-growing colonies, the plots were from 1.6 ha to over 2 ha in size, also rectangular and elongated, 390 m x 40 m, with some parcels in Nowa Łódka exceeding 500 m (own calculations). (Koter, 1969)

The final stage of production, i.e. linen finishing and bleaching, took place in the industrial district, located centrally in relation to the colony. The district was dubbed with an old Polish term "posiadło wodno-fabryczne" (water and factory settlement). The industrial zone was planned along the river Jasień, due to the use of water in the finishing and bleaching process, as well as the plans for a mechanical flax spinning mill powered by falling water. The demarcated industrial district was large, over 200 ha, and elongated. It extended along the river for over 2.8 km, while its width gradually changed from 200-250 m in the western part to 900 m near its eastern border. The water and factory settlements were the first planned industrial zone in Łódź, located in craft settlements. Good economic situation of the town sparked its spatial expansion. In 1840, the area to the east, the so-called New District, was annexed. Its south-western fragment, directly adjacent to the colonies and the industrial zone, was regulated. A rectangular network of streets was created with small plots adapted to urban housing. Despite the small size of the plots in the New District, this is where future factories were built. In the 1860s, urbanisation outside of colonies progressed. Agricultural lands to the west, owned by urban farmers, were regulated. Plots meant for tenement housing were demarcated. These were sized from 0.15 to 0.3 ha. In later years, especially in early 20th century, this area also became the location of industrial enterprises. Starting in the 1860s and 70s, when the development of textile manufacturing, already industrial at that point, accelerated rapidly, the whole area of craft settlements and colonies saw the transformation from crafts to industrial production. Plots turned into factory, industrial, or residential zones. The residential and industrial functions mixed heavily throughout the city. Both small factories and larger multi-division plants were created on original plots demarcated in the initial phase. The industrial development of production, especially in the large multi-division ones, required plots larger than those available in the colonies. Such areas were acquired outside of the city, in suburban spaces of the nearest villages. This process began in the 1870s, with most of these villages included in the city by 1915. Large industrial plots in rural areas were created on agricultural land by accumulating farming plots (source: archival plans).

The study included 38 industrial plots in Łódź, which made up 10% of the overall number of this type of plots in 1986. The sample was selected intentionally; it consisted of the oldest plots, established in the period of the dynamic development of industrial areas. 22 plots were established in 1889 (one of them was later divided into two), 15 were set up later, in the late 19th and early 20th centuries. The

authors selected plots situated in different morphogenetic units, as delimited by Koter. Five of them originate from former colonies of weavers, nine – from former colonies of spinners, three were situated in the gardens of the New Town, three in the New District, four in the water and factory areas, nine in the agricultural areas of Łódź, and four outside the 19th-century Łódź city limits, in the nearby villages of Widzew (1), Dąbrowa (2) and Karolew (3). Each of the selected plots was described at several points in time, i.e. in 1889, 1917, 1928, 1975 and 1986. Further analysis comprised 174 items.

DATA AND METHODS

The analysis of the transformation process of the industrial plot in Łódź can be divided into the following stages:

1. a study of the origins of the spatial layout of the city based on historical sources (maps, historical and geographical studies),
2. the selection of morphological features,
3. the selection of industrial plots to be studied in detail,
4. statistical analysis,
5. an attempt at typology,
6. the determination of transformation phases of the industrial plot.

The authors conducted a hierarchical cluster analysis, which requires a specific procedure consisting of the following stages:

- selecting a set of objects (observations)
- selecting a subset of attributes and establishing an information matrix
- descriptive statistical analysis of the attributes and their rescaling
- cluster analysis
- dendrogram analysis
- an attempt at making a typology
- specifying transformation phases of an industrial plot.

Morphological characteristics of industrial plot

Three characteristics were used to describe a plot in terms of morphology. They were: total area, plot development and shape.

The total area, or the plot's size, is the characteristic most often used in studies of urban morphology, as well as in studies of land use. This is the area enclosed by the boundaries of ownership as described by law. Its size was expressed in square metres or converted into hectares.

The development of industrial plot may vary, there may be different objects and devices depending on the industry and production profile. In the process of ana-

lysing all industrial plots in Łódź before 1989, it was noticed that the development of textile plots did not vary as much. They mostly included factory buildings, some had water reservoirs, and only a few had railway sidings. None of them included residential buildings. Therefore, the percentage of developed land in the overall surface area of the plot was used to characterise the development of an industrial plot in Łódź. The developed area was marked as the projection of buildings on the plan of the plot.

Shape is a morphological characteristic, which specifies the outline of a plot and may be described using a geometric figure. The original plots in craft colonies of Łódź were rectangular, as dictated by the urban planning regulations of craft settlements in early 19th century. After thorough observation of the transformations of industrial plot in Łódź, it was noted that the changes to plot boundaries usually result in the change of the number of angles in the figure describing the shape of the plot. A shape indicator was proposed, which corresponds to the number of angles in the figure describing the boundaries of the plot. It is expressed as a natural number. Shape indicator for a rectangle (the model figure) is 4. This indicator is independent of the size of the plot, it does not react to the length of the boundaries and is only sensitive to changes in the number of sides of the polygon describing the industrial plot in the plan.

RESULTS AND DISCUSSION

In the first stage of the research, the authors selected subset of attributes and establish a matrix of information. In the procedure, the authors did not consider each period separately, but each plot was analysed at all periods simultaneously. Each plot was seen as a polygon characterised by three attributes: total area (hectares), shape, percentage (%) of built-up area.

Industrial plots in Łódź varied widely in terms of size. Considering all plots, throughout the while industrial development period in Łódź, it may be surmised that the smallest plot was only 100 m^2, while the biggest, where Widzewska Manufaktura operated, was 75 ha. The distribution of surface areas was very asymmetrical, with plots below 2 ha dominating throughout the whole period of study. 38 plots chosen for more detailed study had characteristics similar to the whole group (see table 1).

Most of the oldest industrial plots founded before 1889 were rectangular. Over 73% had a shape indicator equal to 4, while the mean shape indicator for all plots under research for this period amounted to 4.85. It was determined that none of the oldest industrial plots in Łódź maintained its original boundaries. They all underwent various changes, both expanding and contracting their overall surface areas, so that the mean shape indicator for this group in the final period of study, 1989, increased to 10.38. Plots established at the turn of the century were also

Table 1 Descriptive statistics values for selected attributes of industrial plots in Łódź (N=174), in 1889 – 1986

Attributes	Statistics values					
	Min.	Max.	Mean	σ	S	K
Total area [ha]	0,33	33,67	5,1	6,3	2,104	4,556
Shape indicator	4	36	8,8	6,5	1,858	3,568
Built-up area [%]	2,60	80,00	39,8	17,6	0,098	0,551

σ - Standard dev., S – Skewness, K - Kurtosis
Source: *author's compilation*

mostly rectangular, with 68% of them having the indicator of 4. The mean shape indicator for these plots in the initial phase was 4.81. Shape changes that occurred in this group resulted in the mean shape indicator of 8.15 in the final period for this group. In the final study period, after numerous and varied changes, 1/3 of the plots had a high shape indicator of 10 or more, including 6 plots with an indicator higher than 20. The highest value of 36 was noted in the plot located at ul. Ogrodowa 17 (former K. Poznanski's factory). A pattern was found where, due to the overall area changes, plots change from rectangles with k = 4 to various polygons with k > 4. Industrial plots chosen for more detailed study had size indicators similar to the whole group (table 1).

The percentage of the developed area in industrial plots in Łódź has always been heavily diverse, as this majority has been determined to a large extent by the size of an industrial enterprise and the dimensions of its plot. It was changing as the enterprise developed. The growth of the development in industrial plots was a continuous process. The developed are was larger than the measurement for the previous period every time. Over more than a hundred years, the mean value of the developed area grew from 16.8% to 46.3% of the overall area. A relationship between plot size and its degree of development was noticed. Small plots always had a higher degree of development than the larger ones. In the 1880s, the value of the percentage of built-up area for small plots was approx. 33%, while it was below 10% for big plots. In 1970s, the values changed to 57% and 33%, respectively. Industrial plots chosen for more detailed study had the percentage of built-up area similar to the whole group (table 1).

Descriptive statistical analysis of the attributes and their rescaling

The next stage of the analysis included the evaluation of the plot distribution, and especially its deviation from the standard distribution. Descriptive statistical analysis was conducted for each of the three attributes mentioned above.

The distribution of all attributes differed from a standard distribution (see table 1); only the percentage of the built-up area on industrial plots was close to standard. Therefore, it was decided to rescale the data (see table 2). The rescaling of each morphological feature into 5 size classes caused a change from interval to ordinal scale. While rescaling actual values, distractions of variables were considered and the natural break classification method was chosen.

Table 2 Actual values of the morphological attributes rescaled into classes

Class	1	2	3	4	5
Total area [ha]	< 1 ha	1 - 2	2,1 - 5	5,1 -10	> 10
Shape indicator	4	5 - 7	7 - 11	12 - 20	> 20
Built-up area [%]	< 30	30 - 40	40,1 - 50	50,1 - 60	> 60

Source: *author's compilation*

Cluster analysis

Hierarchical clustering is one of frequently used taxonomic procedures. It can be described as:

1. It is assumed that each object forms a one-element cluster.
2. A method of clustering the objects is selected.
3. The matrix of distances between pairs of clusters is calculated using the selected method.
4. Pairs of clusters least distant from each other are looked for.
5. Clusters are combined into one new cluster.
6. Steps 3 to 5 are repeated until all objects form one cluster.

In the study, the authors used methods of hierarchical cluster analysis; they selected the squared Euclidean distance as the similarity metric.

Dendrogram

Hierarchical clustering of 174 industrial plots, carried out using Ward's method, resulted in distinguishing eight classes, considered to be morphological types. It is interesting that already at the first level of clustering all the objects were put into groups and there were no outliers, as can be observed on the dendrogram (see figure 1). This proves that each plot belonged to a cluster and there were no items in the set were fundamentally different from the others.

The dendrogram is composed of two very distinct branches, referred to as Mp and Dp. The first branch (Mp) consists of three subtypes, and the other one (Dp) – of five subtypes, which are more diverse than the ones on the first branch (Mp).

An analysis of the morphological characteristics of individual types leads to the conclusion that the attribute which differentiates the plots the most is their total area. The Mp type contains all small plots (class 1-2), while the Dp type includes the largest ones (class 2-3).

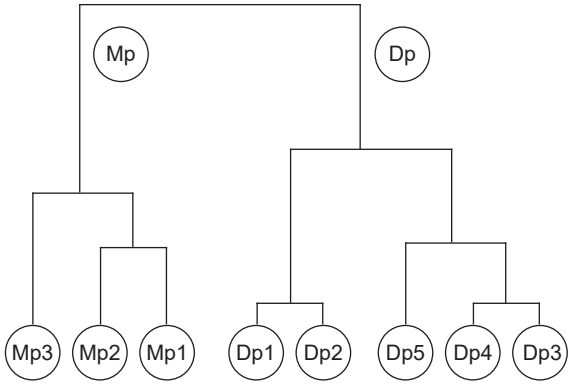


Figure 1
A dendrogram illustrating the process of clustering industrial plots in Łódź, using Ward's method
Source: *author's compilation*

An attempt at making a typology

The two distinct branches of the dendrogram prove the existence of two contrastive groups of morphological types of industrial plots in Łódź. The analysis of the morphological attributes of individual types and the comparison of the types aggregated into clusters enabled the authors to distinguish both features common for these groups and those which make them different.

The first branch consists of types Mp1, Mp2 and Mp3. Their common feature is a small area, usually belonging to the first, sometimes to the second size class, a rather undeveloped shape, usually in the first, only occasionally the second or third class, as well as an extremely varied built-up area development, with the percentage of built-up area ranging between the lowest and the highest values (see figure 2).

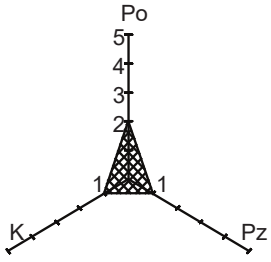
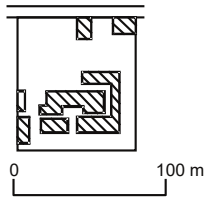
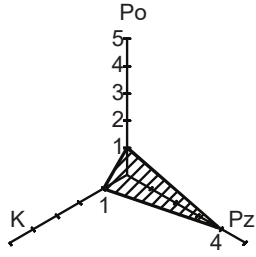
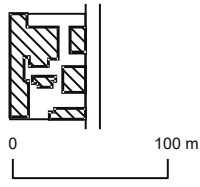
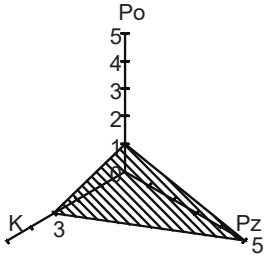
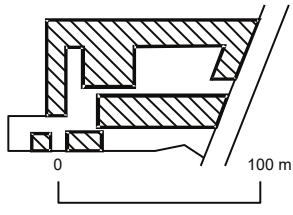
Type	Typogram	Address/street	year
Mp1		Kopernika 58/60 	1889
Mp2		Brzozowa 5/7 	1917
Mp3		Żeligowskiego 3/5 	1975

Figure 2
Morphological types of Łódź industrial plots Mp1, Mp2 and Mp3
(Po – total area, K – shape indicator, Pz – built-up area [%])
Source: *author's compilation*

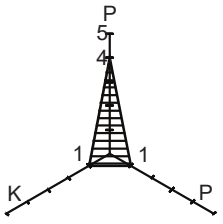
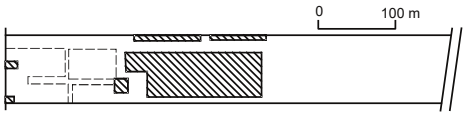
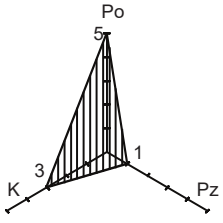
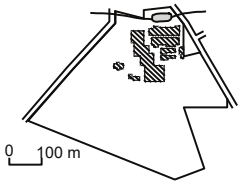
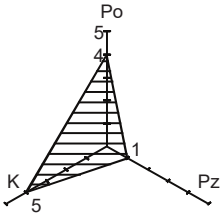
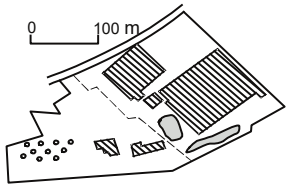
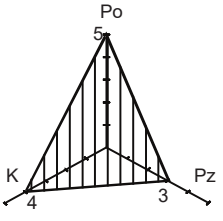
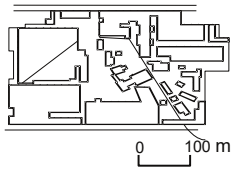
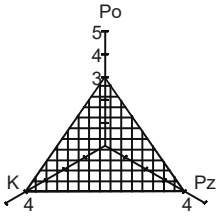
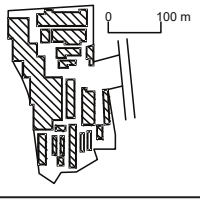
Type	Typogram	Address/street	year
Dp1		Kilińskiego 228 	1917
Dp2		Rzgowska 17 	1889
Dp3		Smugowa 11 	1928
Dp4		Piotrkowska 293/295 	1975
Dp5		Rzgowska 17 	1986

Figure 3
Morphological types of Łódź industrial plots Dp1 – Dp5
(Po – total area, K – shape indicator, Pz – built-up area [%])
Source: *author's compilation*

Defining transformation phases of industrial plots

The taxonomic method used by the authors enabled them to conduct a dynamic analysis of the changes in the morphological types of the studied plots at individual study periods. It was thus possible to identify those which were typical of the initial period in the 19th century and were gradually disappearing, as well as those from later or final periods which were appearing along with the morphological transformations.

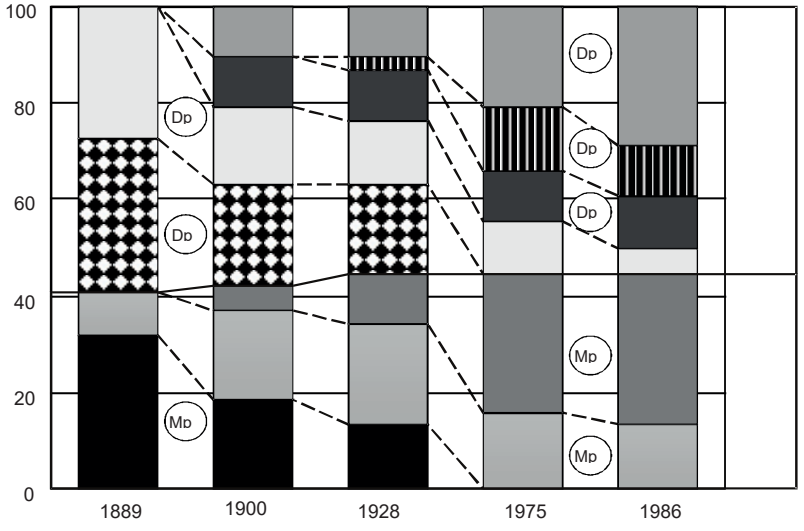


Figure 4
Structural graph of the morphological types of industrial plots.
Source: *author's compilation*

Initially, in the 1880s, the diversification of the morphological types of industrial plots was small (see figure 4). There were four types – Dp2, Dp1, Mp2, and Mp1. At the turn of the 20th century their morphological diversification increased and new types appeared (Mp3, Dp3 and Dp5), which then constituted 25% of the studied plots. At that time, nearly all the small plots were tetragonal; the building-up of Mp1 plots did not exceed 30% and reached about 50% in Mp2 plots.

During the interwar period (1918-1939), the morphological diversification of industrial plots of land was the largest, with all eight types present at that time. Small plots were dominated by type Mp2 (undeveloped shape, densely built-up), but the percentage of type Mp3 (better-developed shape and even more densely built-up area – over 60%) increased, which shows a transition towards building up the area more densely and forming a better-developed shape.

In the second half of the 20th century, the number of morphological types of industrial plots went down to six, because the two types of the initial phase, Mp1 and Dp1, which dominated a hundred years earlier, ceased to exist. The percentage of types Mp2 and Dp2, previously common, also decreased. At that time, the predominant type of a small plot was Mp3, in which the plots were densely built-up (over 60%) and their shape was moderately developed (up to 12). The group of large area plots was dominated by type Dp5, followed by Dp3 and Dp4. It should be stressed that none of them occurred at the initial stage (see figure 4). Large plots became more densely built-up and acquired a well-developed shape (in type Dp3 and Dp4), as well as decreased their total area (type Dp4 and Dp5). They evolved towards a smaller total area, higher density of buildings and very well-developed, advanced shape.

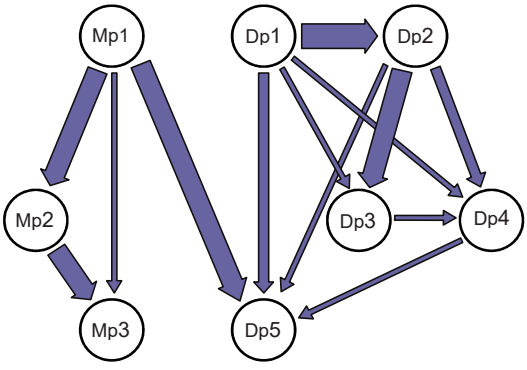


Figure 5
A model of the morphological transformations of an industrial plot. The width of vectors signifies the frequency of changes between the types.
Source: *author's compilation*

A detailed analysis of the transformations of the types of individual plots resulted in constructing a model of the morphological transformations of Łódź industrial plots (see figure 5). By analysing the order in which the morphological types occurred, the authors confirmed the increasing intensity of the use of these urban areas.

Examples of transformation

To provide an example of transformations of an industrial plot in Łódź over a period 100 years, the plot located at Rewolucji 1905 r. No. 52 was selected. It was established within the wool weavers' gardens of the Nowe Miasto district. In the initial phase, its surface area was 0.75 ha, with a regular shape of an elongated rectangle

and 31.8% built-up area (see figure 6). Due to the expansion of the enterprise, it grew to 1.13 ha. The shape was still rectangular, though the ratios changed. For dozens of years, the built-up area was gradually increased, to reach 46% of the overall surface area by 1928. In the mid-20th century, the plot was divided. The area of the industrial plot decreased to 0.9 ha, the whole industrial developed remained on it, which increased the percentage of built-up area to 52.4%. The shape also changed, which increased the shape indicator to 8. The front building excluded from the plot was converted into subsidised housing, and a new residential building was constructed in the 1950 in the previously undeveloped eastern part of the plot. As a result of these changes, the plot was converted from Mp1, through Mp2 into Mp3 in the final stage.

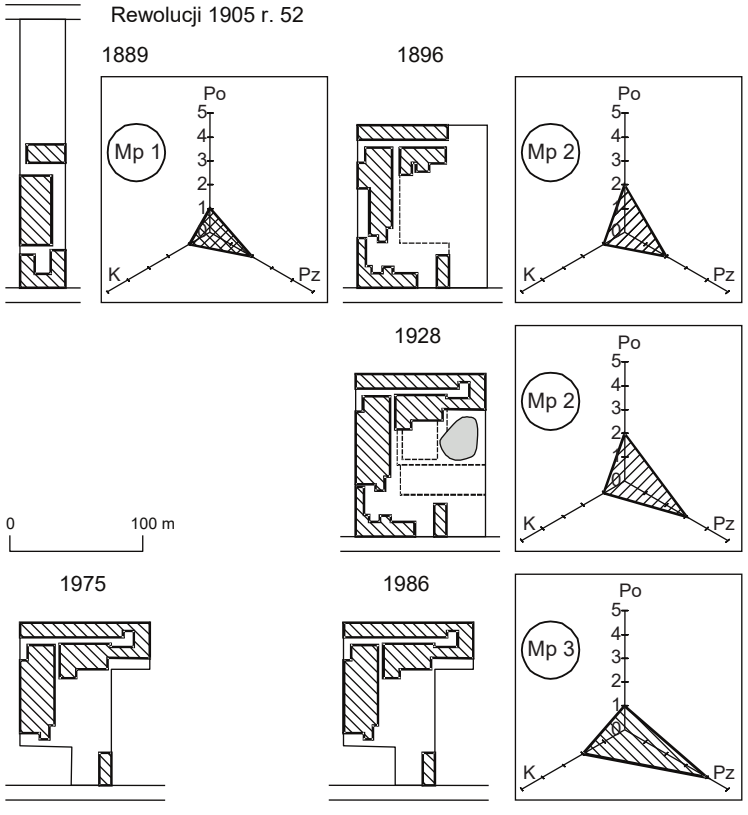


Figure 6
Model of the morphological transformations of an industrial plot, street Rewolucji 1905 r. No. 52
Source: *author's compilation*

The plot at Łąkowa No. 3/5 was founded on urban farmland belonging to farmers in Łódź. In the initial phase in the 19th century, the plot already doubled in size from 4.4 to 8.8 ha (see figure 7). The expanding enterprise increased the built-up area to 15.3 thousand m^2, or 17.4% of the total area in the interwar period. In the mid-twentieth century changes were made, involving the merger of two companies into one. Thus, adjacent plots were combined, but not entirely. Only the parts that were developed industrially were combined. As a result, the area of the plot was slightly reduced to 8.01 ha, but the percentage of built-up area doubled to 38.9%. Free space in the back of both plots, along with other free adjacent areas were allocated to a housing estate, while excluded non-production buildings, mainly located along the street, were allocated to different, mostly social, functions. After these changes, a rectangular plot was transformed into a polygon with 16 sides and angles. The plot, initially a Dp1, turned into a type Dp4 in the final phase.

The plot at J. Kilińskiego No. 228, located in the former colony of Nowa Łódka, maintained its original area of 5.3 ha and its rectangular shape until mid-20th century, gradually increasing its built-up area to 15.5 thousand m^2 or 29.1% of its overall area (see figure 8). In the mid-20th century, part of the adjacent plot was added, along with its buildings. Soon after, the free space in the back of the plot was added. These changes resulted in the increase of the overall area to 6.7 ha, with built-up area growing to 2.7 ha or over 40% of the overall area. These transformations also led to the increase in the shape indicator to 10. The plot was converted from type Dp1 in its initial phase, through Dp4 to Dp5 in the final phase.

The plot located at Rzgowska No. 17 is an example of a plot established in late 1870s in a rural area, outside the boundaries of Łódź, in Dąbrowa village (see figure 9). The plot was initially big, 19.1 ha. It was located between two main roads in this area, Rzgowska and Pabianicka. In the 20th century, fragments of the plot were gradually allocated to residential buildings along the streets. Within the industrial part, a park and palace complex were established, apart from the industrial buildings of a multi-division textile enterprise. In the second half of the 20th century, the complex, along with other non-industrial fragments, were separated from the plot, which reduced its size to 4.9 ha and, consequently, increased the percentage of built-up area to 56.4% of the overall area in the final stage. At the same time, the shape indicator was steadily growing from 11 in the initial phase to 21 in the final period. The plot went from type Dp2 through Dp3 and Dp4 to become a Dp5 in the final stage.

CONCLUSIONS

The taxonomic methods used in the study provided interesting, if not surprising results. Apart from the expected classification used to distinguish the morphological types of industrial plots, they enabled the authors to identify the most common types in individual study periods. The study has shown which of them were characteristic towards the end of the 19th century and disappeared over time, as well as those which appeared in the consecutive decades of the 20th century.

Another result of the applied taxonomic method was a model of the transformations of an industrial plot in Łódź. Its features should be verified through morphological studies of other industrial cities in Poland, similar to what (Musiaka et al., 2020) described for the largest Polish cities. It is worth checking whether the model works well for examining changes in plots related to the textile industry or other industries.

REFERENCES

BATTY, M., & LONGLEY, P. (1994). *Fractal cities: a geometry of form and function*. Academic Press. http://discovery.ucl.ac.uk/1370661/1/1370661_Fractal Cities Low Resolution.pdf

CONZEN, M. P. (1960). *Alnwick, Northumberland: A study in town-plan analysis* (2nd ed., Vol. 27). The Institute of British Geographers. https://doi.org/ 10.1177/ 03091 32509334948

CONZEN, M. P. (1962). The plan analysis of an English city centre. In K. Norbort (Ed.), *Proceedings of the IGU Symposium in Urban Geography Lund 1960* (pp. 383–414).

CZEKANOWSKI, J. (1911). Objektive Kriterien in der Ethnologie. *Korrespondenz Der Blatt Deutschen Gesellschaft Für Anthropologie, Ethnologie Und Urgeschichte*, *42*, 71–75.

DARIN, M. (1998). The study of urban form in France. *Urban Morphology*, *2*, 63–66. http://www.urbanform.org/online_unlimited/um199802_63-76.pdf

FISHER, R. A. (1936). The use of multiple measurements in taxonomic problems. *Annals of Eugenics*, *7*(2), 179–188. https://doi.org/j.1469-1809.1936.tb02137.x

GRIMSHAW, P. N., SHEPHERD, M. J., & WILLMOTT, A. J. (1970). An application of cluster analysis by computer to study of urban morphology. *Transactions of the Institute of British Geographers*, *51*, 143–161. https://www.jstor.org/stable/pdf/621767

HOFMEISTER, B. (2004). The study of urban form in Germany. *Urban Morphology*, *8*(1), 3–12. http://www.urbanform.org/online_unlimited/pdf2004/200481_3-12.pdf

KOTER, M., & KULESZA, M. (1999). The plans of medieval Polish towns. *Urban Morphology*, *3*(2), 63–78. http://www.urbanform.org/online_unlimited/um199902_63-78.pdf

LARKHAM, P. J. (2006). The study of urban form in Great Britain. *Urban Morphology*, *10*(2), 117–141. https://doi.org/10.1185/030079905X61749

LARKHAM, P. J., & CONZEN, M. P. (Eds.). (2014). *Shapers of Urban Form. Explorations in Morphological Agency*. Routledge. https://doi.org/10.4324/9781315817064

MARZOT, N. (2002). The study of urban form in Italy. *Urban Morphology*, *6*(2), 59–63. http://www.urbanform.org/online_unlimited/pdf2002/200262_59-73.pdf

MATLOVIČ, R. (1995). Morfologické procesy v historickom jadre Prešova vo svetle Conzenovej urbánnomorfologickej koncepcie. *Geographia Slovaca*, *10*, 141–149.

MUSIAKA, Ł., FIGLUS, T., & SZMYTKIE, R. (2020). Models of morphological transformations of centres of the largest Polish cities after World War II. *European Planning Studies*, 1–25. https://doi.org/10.1080/09654313.2020.1744529

PEETERS, A., & ETZION, Y. (2012). Automated recognition of urban objects for morphological urban analysis. *Computers, Environment and Urban Systems*, *36*(6), 573–582. https://doi.org/10.1016/j.compenvurbsys.2012.05.002

SOKAL, R. R., & MICHENER, C. D. (1958). A statistical method for evaluating systematic relationship. *University of Kansas Science Bulletin*, *38*, 1409–1438.

TRIGUEIRO, E., & SOARES DE MEDEIROS, V. A. (2007). Of dwellings and streets that connect: a brie honey-moon. *Fourteenth International Seminar on Urban Form, Ouro Preto, Brazil*.

ÜNLÜ, T., & BAŞ, Y. (2017). Morphological processes and the making of residential forms: Morphogenetic types in Turkish cities. *Urban Morphology*, *21*(2), 105–122.

WHITEHAND, J. W. R. (2001). British urban morphology: The Conzenian tradition. *Urban Morphology*, *5*, 103–109. https://doi.org/10.1097/HJH.0000000000000320

FOLIA GEOGRAPHICA • ISSN 1336-6157 (hard copy) • ISSN 2454-1001 (online)

TYPOLOGICAL INVENTORIZATION AND RAPID ECOLOGICAL HEALTH ASSESSMENT OF THE WETLANDS OF MEDINIPUR COASTAL PLAIN, INDIA

Asit Kumar ROY [A], Proshanta Kumar GHOSH [B], Debajit DATTA [C*]

Received: June 16, 2020 | Revised: August 18, 2020 | Accepted: August 24, 2020
Paper No. 20-62/1-560

Abstract
Coastal wetlands provide a multitude of ecosystem services and diversified livelihood opportunities for millions in India. Due to unsustainable human activities and recent climatic anomalies, many of these wetlands are losing their ecological vitality and even extirpating in extreme cases; as evident in the Medinipur Coastal Plain of Eastern India. However, no comprehensive management plan has been framed till date, towards sustainable utilization of these wetlands. In this context, development of an appropriate regional wetland inventory, based on relevant ecological parameters, was conceived to be the pre-requisite for implementing such management strategies. Accordingly, an attempt had been made here to develop a typological inventory based on the ecological health status of major wetlands (>2.25 ha) of this region. Cumulatively, four varied ecological health scenarios were identified for these wetlands using multi-source geospatial datasets, on-field measurements, focus group discussions, and secondary sources. Specifically, wetlands with lesser human footprints, synergetic agroecosystem practices, and better intertidal connectivity displayed superior ecological health compared to the ones associated with tourism and aquafarming. It was also realized that this study could greatly enhance the decision making capability of the stakeholders, researchers, and policy makers involved in sustainable management of these resources.

Key words
Anthropogenic stress, Aquatic ecosystem, Brackish water farming, Ecological indicator, Sustainable livelihood.

INTRODUCTION

Coastal wetlands occupy the transitional zones between land and sea, consequently merging both marine and terrestrial ecosystems. In general, these ecosystems support a rich biological diversity, which is highly beneficial for generating a wide range of livelihood opportunities for communities living near wetlands, as well as promoting broader regional economic activities (Fretwell et al., 1996;

A Jadavpur University, Department of Geography, Kolkata, West Bengal, India
asit.roy790@gmail.com
B Jadavpur University, Department of Geography, Kolkata, West Bengal, India
proshantaat@gmail.com
C* Jadavpur University, Department of Geography, Kolkata, West Bengal, India
debajit.geo@gmail.com (corresponding author)

Lee et al., 2006; Borchert et al., 2018). The saline environment of shallow marine water, coral reef, estuarine mudflat, salt marsh and lagoon offers favourable conditions for commercial fishing and aquaculture; specifically, in the tropics where different types of euryhaline fishes, crustaceans and halophytic plants are found in abundance (Lee et al., 2006; Secretariat of the Ramsar Convention, 2010; Borchert et al., 2018). In addition, the rain-fed coastal depressions are also utilized here for paddy-cum-brackish water fish cultivation, which has been identified as one of the most effective instances of agroecosystem practices in tropical Asia (Datta et al., 2012; Lescourret et al., 2015; Langerwisch et al., 2017; Kumaran et al., 2020).

Being an abode to both terrestrial and marine organisms, coastal wetlands are favoured by many fishes (*viz. Harpadon nehereus, Hilsa kelee, Penaeus monodon, Pampus argenteus*), reptiles (*viz. Lepidochelys olivacea, Varanus salvator*) and water birds (*viz. Ardea alba, Calidris ferruginea, Pelargopsis capensis*) for breeding and migratory activities (Chakraborty, 2017). In fact, millions of migratory waterbirds feed on the extensive fish population which thrive here (Sievers et al., 2018). However, the habitat conditions of these wetlands have severely degraded due to several perilous natural and anthropogenic forces in recent times (Kennish, 2002; Barbier et al., 2011). Occurrences of eminent eustatic changes, repetitive extreme cyclones, destructive tsunami waves, and striking tidal surges were the naturally occurring factors chiefly responsible for the deteriorating habitat condition of these wetlands. However, the degree of decaying has noticeably accelerated due to the addition of human induced stresses (Cahoon et al., 2006; Datta et al., 2012). Expansion of coastal settlements, growth of beach tourism, construction of protective embankments, commercial aquafarming, extensive crop farming and over exploitation of wetland resources are some factors responsible for the degradation and increasing vulnerability of this fragile coastal ecosystem (Kirwan and Megonigal, 2013; Roy and Datta, 2018).

Along the East Coast of India, the states of West Bengal and Odisha have noticeably high concentration of coastal wetlands (Venkataraman, 2008). Though a major part of the West Bengal coast is bordered by the Sundarbans mangrove swamps, its south-western littoral part is also interspersed with several other types of coastal wetlands (*e.g.* intertidal mudflats, salt marshes, interdunal wetlands), which contributes to the wide range of biodiversity of this region (Chakraborty, 2017). These wetlands are primarily located in adjoining areas of tidal creeks, along the intertidal lowlands and within the interdunal swales. In reality, all of these wetlands and their coupled agricultural systems together create a rich coastal agroecosystem (Bassi et al., 2014). Over the last few decades, many of these wetlands have been converted into commercial fisheries, paddy mono-cropping fields and salt production units (Rani et al., 2015; Jayanthi et al., 2018).

The populace of coastal West Bengal and Odisha are notably dependent on either brackish water aquaculture or the emerging beach tourism activities of this

region. The economic prospects offered here, lead this entire coastal tract to be populated gradually (Tripathy, 2012; Dutta et al., 2016). Eventually, this was only possible through reclaiming those coastal wetlands and altering its prevailing natural landscape (Dutta et al., 2016; Roy and Datta, 2018). An extensive review of literature indicates that the environmental conditions of many of these wetland complexes are degrading due to intrusion of polluting agents originating from fish farms and tourism industries (Lee et al., 2006; Chakraborty, 2010; Jayanthi et al., 2018; Ragavan et al., 2020).

In this context, the present study has been designed to develop a typological inventory and infer the current ecological health status of diversified coastal wetlands of the Medinipur coastal plain of West Bengal and Odisha. Several studies had already been conducted focusing on coastal morphodynamics and biological diversity of this region separately (Niyogi, 1975; Chakrabarti, 1995; Chakraborty, 2010; Roy and Mitra, 2019). However, no comprehensive environmental assessment of these wetlands has been done till date, on the integrated approach of inventorying and appraisement of ecological health. In view of this immense research gap, the present study had been primarily initiated to identify the major coastal wetland composites of the study region and thereby develop a typological inventory considering the major wetland composites under each distinct wetland types, already established in several relevant literatures (Secretariat of the Ramsar Convention, 2010; Panigrahy et al., 2011). Later on, a rapid ecological health assessment was also conducted on those major wetland composites.

METHODOLOGY

Delineation of the study region

The south-western part of littoral West Bengal occupies an elongated coastal tract along the margin of Bay of Bengal. This coastal tract, also known as Medinipur Coastal Plain (MCP), is situated along the Purba Medinipur district of West Bengal and extended till the Baleshwar district of Odisha (Chakrabarti, 1995; Chakrabarti and Nag, 2015; Roy and Datta, 2018). Noticeably, this 46 km long mesotidal (2-4 m) coastal plain is variegated in terms of several geomorphic features such as long sandy beaches, successive rows of dunes, interdunal swales, and intertidal mudflats (Niyogi, 1975; Chakrabarti, 1995; Chakrabarti and Nag, 2015). Specifically, these successive rows of dunes, parallel to the beaches from north to south, also known as frontal dunes; are one of the most prominent terrain units of this region. Among these, the Ancient Dune Complex (ADC) in the north and the beach-face dune complex in the south, act as the upper and lower extent of the MCP (Chakrabarti, 1991; Wal and McManus, 1993; Chakrabarti, 1995). Based on physiography, MCP can be divided into four sectors from west to east namely Digha, Chandpur,

Dadanpatrabar and Junput. These sectors had been separated by few tidal inlets like Champa creek, Jaldha creek, and Pichaboni creek (Chakrabarti and Nag, 2015).

In the presence of the complex geomorphic setting, coupled with the regional hydrological system, different types of coastal wetlands have formed along this coastal plain among which mangroves, mudflats, saltmarshes and interdunal wetlands are the most prominent and naturally evolving wetland types of this region (Morris et al., 2002). Here, the mangrove patches are usually found along the sheltered coastline fringed with sandy or muddy beaches, adjacent to the clayey sediments supplied by several rivers (*e.g.* Subarnarekha, Rasulpur, and Haldi) and tidal creeks (Nayak and Bahuguna, 2001). Mudflats are also an integral part of these coastal wetlands, mostly developed due to sedimentation of clay rich sediments in the presence of calm depositional environment on either side of the estuaries (Nowacki and Ogston, 2013). Moreover, saltmarshes are usually found along the coastal depressions, located at the supratidal zone of Chandpur and Dadanpatrabar sectors; which were previously inundated by diurnal tides (Allen 2000). Some areas of this coastal plain are also characterized by marshy swales, identified as interdunal wetlands; generally, found along the depressions of both older as well as younger dune complexes of MCP (Running et al., 2002). However, these mudflats, saltmarshes and interdunal wetlands are rapidly being converted into aquacultural farms in places like Kirtaniajalpahi, Kumbhirgari, Sankarpur, Tajpur, Sona Muhi, Dakshin Purushottampur, Junput, and Bankiput during the last two

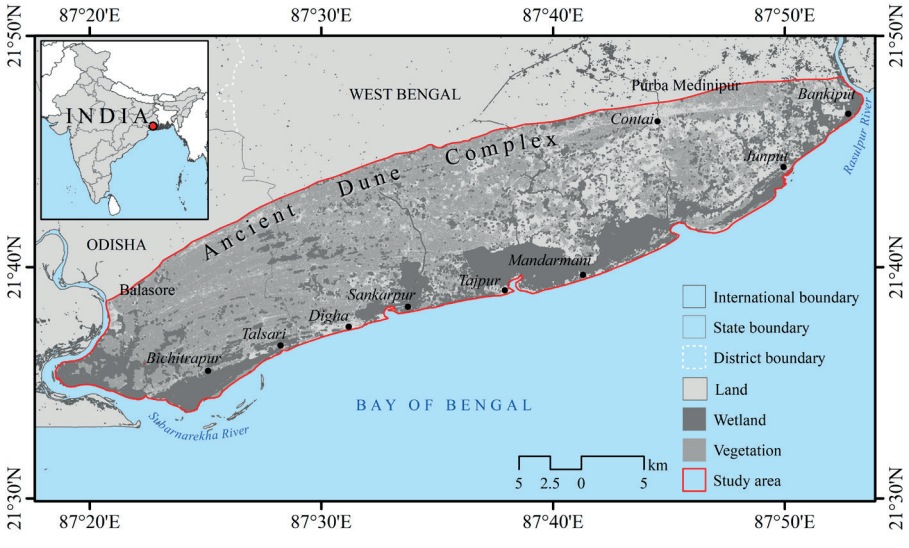


Figure 1
Location of the study region

decades. Consequently, these partially modified or constructed wetlands had also become integral parts of the regional coastal agroecosystem.

The MCP extends from the left bank of Subarnarekha estuary to the right bank of Rasulpur estuary and from the northern elongated arc shaped ADC to the southern continuous shoreline of Bay of Bengal (Fig. 1). The entire region was studied rigorously to develop a detailed inventory of diversified coastal wetlands with special focus on their ecological health status. The latitudinal and longitudinal extension of the study region was from 87°18 ′ 35″E to 87°53″19E and 21°32′56″N to 21°48′39″N occupying an area of nearly 64313.4 ha.

Comprehending coastal wetland typologies

A clear and discrete classification of tropical coastal wetlands has rarely been established by scholars in the related fields of research (Morris et al., 2002). However, Ramsar Convention on Wetlands provides a comprehensive definition of wetlands exhibiting an array of coastal wetland types such as estuaries, deltas, marshes, tidal flats, mangroves, coral reefs and salt pans (Secretariat of the Ramsar Convention, 2010). The information brochure of National Wetland Inventory and Assessment (NWIA) of India prepared under the joint initiative of Ministry of Environment and Forests (MOEF), Government of India (GOI), and Space Applications Centre of ISRO, Ahmedabad; provides copious information on different types of wetlands of India. According to this report, nineteen types of wetlands actually exist in India, among which nine types have been found along the coastal areas of West Bengal and Odisha (Panigrahy et al., 2011).

Based on peer reviewed literature on tropical coastal wetlands and analyzing the study region through on-field reconnaissance surveys, five distinct types of coastal wetlands *viz.* mangroves, mudflats, salt marshes, interdunal wetlands, and constructed wetlands had been identified, which were directly exposed to the numerous anthropogenic stressors. These wetland types were further verified with the wetland classification system of NWIA and Ramsar definition of wetlands. Among the five identified wetland types; mangroves, mudflats and salt marshes are situated at the active coastal zone (Morris et al., 2002). Conversely, Interdunal wetlands are mainly located far away from the present shoreline since it originated due to paleo marine-coastal actions during the transgressive phase of the late Holocene epoch (6000 years B.P.) along this coastal tract (Chakrabarti and Nag, 2015). Furthermore, constructed wetlands are usually found nearer to the coastline to take advantage of intrusive sea water during flood tide for practicing brackish water aquaculture (Dutta et al., 2016; Jayanthi et al., 2018).

Inventorization of coastal wetlands of the study region

The principal aim of any wetland inventory is to provide a detailed account of distribution, categorization and physiographic characteristics of diversified wetlands (Scott and Jones, 1995; Secretariat of the Ramsar Convention, 2010). Hence, identification of the probable types and perceiving their spatial distribution patterns is highly imperative before developing such an inventory. Accordingly, a typological inventory of coastal wetlands had been developed here considering multiple key indicators associated with the general characteristics of coastal wetlands as well as their surrounding environment. Information regarding those indicators had been derived from remote sensing (RS) and geographic information systems (GIS) along with field based observations and secondary data sources (Panigrahy et al., 2011; Chunye and Delu, 2017).

Initially, two multispectral satellite images, acquired by Sentinel 2B with 10 m spatial resolution (Date of acquisition: 15th April, 2018; Tile No.: T45QWE and T45QWD), were used for delineating the area of interest (AOI) of this study using the Erdas Imagine 2014 software (Shalaby and Tateishi, 2007; Datta and Deb, 2012; Roy and Datta, 2018). Thereafter, maximum likelihood algorithm based supervised classification technique had been applied on this AOI to identify the zones with water/ moisture content, as the spectral reflectance of land with high moisture content is completely different from the rest of the land use/ land covers (LULCs) (Lillesand et al., 2008; Li et al., 2018; Roy and Datta, 2018). Furthermore, the widely used Normalized Difference Water Index (NDWI) had been derived for the AOI to demarcate the area under perennial wetlands by detecting the changes in water content within green foliage (Ji et al., 2009; Kuleli et al., 2011; Kaplan and Avdan, 2017; Wu et al., 2018). McFeeters (1996) defined NDWI as the ratio of two possible combinations of Green and Near-Infrared (NIR) channels, which can also be explained using the following equation (i):

$$NDWI = (Green - NIR)/(Green + NIR) \qquad (i)$$

The value of NDWI ranges from -1 to +1, where higher value indicates more amount of water content in vegetation cover and vice versa (Ji et al., 2009). After corresponding the pixels having higher NDWI values with the pre-determined wetland areas obtained from the LULC classification maps; the actual spatial distribution of coastal wetlands had been delineated. Finally, the raster dataset covering all wetland sites of the region was converted into a vector layer (.shp) to make it compatible with ArcGIS platform for further geospatial analyses (McCarthy et al., 2018).

Through this procedure, approximately 78,419 individual wetland polygons had been identified. A shortlisting of major wetlands had further been done by removing small/ minor wetlands having an area of less than 2.25 ha and merging separate polygons under individual wetland composites (Panigrahy et al., 2011;

Tiner et al., 2015). Subsequently, around 203 individual wetland composites had been identified through this procedure. Among these, in terms of their maximum areal Coverage, the five biggest wetland composites were identified from each coastal wetland types and a total of 25 representative wetland composites were shortlisted from the entire study region for in-depth research. Few other indicators related to physical characteristics of wetlands (*i.e.* dominant land surface features, soil types, types of water, primary sources of water) as well as related socio-economic and institutional sustainability issues (*i.e.* presence of management organization, major livelihood option and existing threat to wetland ecosystem etc.) were also used for this purpose (Table 1). Accordingly, these 25 coastal wetlands were intensively studied to develop a typological inventory of the coastal wetlands of MCP. These indicators had been quantified by a mixed method incorporating geo-spatial databases, personal interactions with members of coastal communities, intensive field based observations and secondary data sources.

Table 1 Identified major indicators related with inventorization of coastal wetlands

Indicator	Description	Source
Areal extent (WA)	Wetlands with more than 2.25 ha area	Panigrahy et al., 2011; Tiner et al., 2015
Wetland type (WC)	NWIA, 2011	Panigrahy et al., 2011
Dominant land surface features (LF)	Dominated geomorphic features in the wetland area	Field observation
Soil type (ST)	USDA World Soil Information acquired from International Soil Reference and Information Centre (ISRIC)	FAO, 2014
Water type (WT)	Based on total dissolved solids (TDS) characteristics of water	Field measurement
Primary source of water (WS)	Information obtained from primary field based survey	Field survey
Presence of management organization (MO)	Profit and non-profit organization are engaged in environmental management	Focus group discussion
Major livelihood option (LO)	Wetland resource based rural livelihood pathways	Focus group discussion
Existing threat for wetland ecosystem (ET)	Adverse environmental impacts as offshoots of natural calamities and maladaptive economic engagements of inhabitants	Field observation and focus group discussion

Ecological health assessment of different types of coastal wetlands

Ecological health is a comprehensive concept, which represents a synthesis of the quality of different ecological indicators in a particular environmental state (Jørgensen et al., 2005; Datta and Deb, 2017). In this study, the status of ecological health was assessed for the selected 25 representative wetlands of the study region. Several indicators related to physical, chemical, and biotic characteristics of wetlands, human encroachment, and provisions of agroecosystem services (AES) were identified after reviewing relevant literature on ecological health indicators of coastal wetlands as well as from field based experiences (Table 2) (Jørgensen et al., 2005; Jiang et al., 2014; Datta and Deb, 2017). Some of the indicators (*e.g.* water pH and faecal coliform) were measured by testing wetland water samples under laboratory conditions (Alexakis et al., 2016; Sinaga et al., 2016). Conversely, some other indicators such as turbidity, dissolved oxygen, eutrophication status, and tree density were assessed or measured in-situ (Alexakis et al., 2016; Bachmann et al., 2017; Jakobsson and Lindborg, 2017). Information regarding dominant LULC patterns from around 500 m of the wetlands were collected through field observations of the investigators and validated by the open-source thematic database (https://bhuvan-app1.nrsc.gov.in/thematic/thematic/index.php) of national level LULC map (Scale 1:250,000) derived from the Advanced Wide-Field Sensor (AWiFS) data of Resourcesat-1 and 2 (NRSA, 2007). Information related to rest of the indicators (*e.g.* flooding frequency, seasonality or duration of water, status of weed infestation, presence of native rare or endangered floral and faunal species, spread status of invasive or exotic species, instances of mass death of animals as well as human-wildlife conflicts, and provision of agroecosystem services) were collected through focus group discussions (FGDs) with local community members in groups of 5-8 persons using a semi-structured questionnaire (Supplementary Table 1). Among these indicators, a detailed directory of native rare or endangered as well as invasive or exotic floral and faunal species were already prepared before surveying the coastal populace, using the open source data archive of the International Union for Conservation of Nature (IUCN), repository of the Botanical Survey of India and a priori knowledge of the investigators regarding the study region (MOEF, 2011; ENVIS Center on Floral diversity, 2016; IUCN, 2020). During these interactive sessions, care was taken for gathering as much local knowledge as possible on the wetland characteristics and their utilization scenarios (Krueger, 2014; Bartlett et al., 2017). Since, all of these selected indicators are equally liable to determine a healthy ecological condition of coastal wetlands, the multi-scaled original datasets of health indicators were standardized by assigning scores from 1 to 5, considering their impacts in maintaining an optimal environmental quality in a wetland (Datta and Ghosh, 2015). Here, the score of 1 represented very low and 5 represented very high status of ecological health. Through in-depth literature review, it had

Table 2 Identified ecological health indicators of coastal wetlands of the study region

Group	Indicator	Data source/ method of measurement	Reference
Physical	Flooding frequency (FF)	FGD	Tran and James, 2017
	Seasonality or duration of water cover (DW)	FGD	Tran and James, 2017
	Dominant land use in the immediate surroundings of wetland (DL)	In-situ field survey and open-source LULC of Bhuvan-AWiFS database	NRSA, 2007
	Presence of agroecosystem services (AES)	FGD	Lescourret et al., 2015
Biochemical	Water pH in logarithmic scale (pH)	Bench top pH meter (HANNA HI2221)	Datta and Deb, 2017
	Dissolved oxygen in mg l^{-1} (DO)	Portable EI Products' Digital DO Meter (Model 831 E)	Said et al., 2004; Jørgensen et al., 2005
	Turbidity in NTU (T)	Turbidity meter (HACH LXV322.99.00002)	Said et al., 2004
	Eutrophication status (EU)	In-situ field survey on algal bloom and Secchi depth transparency	Smith, 2003
	Faecal coliform in CFU ml^{-1} (FC)	Laboratory analysis by membrane filter technique	Said et al., 2004
Biotic	Tree density in number of trees ha^{-1} (TD)	In-situ field survey	Datta and Deb, 2017
	Status of weed infestation (WI)	FGD and in-situ field survey	Tomita et al., 2003
	Presence of native rare/ endangered plants in number of species ha^{-1} (EP)	FGD and in-situ field survey	Laba et al., 2008; ENVIS Center on Floral diversity, 2016; IUCN, 2020
	Status of invasive/ exotic plant species in number of species ha^{-1} (IP)	FGD and in-situ field survey	Laba et al., 2008; ENVIS Center on Floral diversity, 2016; IUCN, 2020
	Presence of native rare/ endangered animals in number of species ha^{-1} (EA)	FGD and in-situ field survey	Serafy et al., 2007; MOEF, 2011; IUCN, 2020
	Status of invasive/ exotic animal species ha^{-1} (IA)	FGD and in-situ field survey	Serafy et al., 2007; MOEF, 2011; IUCN, 2020
	Instance of mass-death of animals in last 5 years (AD)	FGD	Distefano, 2005
	Intensity of man-animal conflict (C)	FGD and in-situ field survey	Distefano, 2005

been observed that if the higher value of any indicator tended to be detrimental to the environmental sustainability of a wetland, then the score was given in an inverse order with 1 being the score of higher values and vice versa (Datta and Ghosh, 2015; Majumdar et al., 2019).

For the physical indicator of dominant LULC, the weightage given was dependent on the presence and nature of vegetal cover within a particular LULC class. For instance, other vegetation covers have been assigned higher score than Casuarina plantation and agricultural lands. In contrast, the rest of the physical indicators have been scored in a manner so that higher values of indicators correspond to higher scores (Supplementary Table 2).

A wide variety of chemical indicators had been used in this study to assess the wetland health in an inclusive manner. One of the most important chemical indicator is water pH, which was scored in a quite different manner. Since, the extreme conditions of pH, *viz.* highly acidic (<3) and highly alkaline (>11), were both not suitable for maintaining healthy wetland condition, minimum score was accordingly assigned to the corresponding extreme values. In this way, the maximum score had been specified to the optimum range of pH, from 6 to 8. For other chemical indicators such as status of eutrophication (EU), turbidity (T), and faecal coliform (FC), higher values were identified to be detrimental to wetland vitality. Hence, minimum scores were given with respect to higher values and vice versa.

Several biotic indicators associated with the floral and faunal diversity were also incorporated in this study to comprehend the relative ecological sensitivity of coastal wetlands. Among these, tree density (TD) (Supplementary Table 3), presence of endangered plant species (EP) (Supplementary Table 4), and endangered animal species (EA) (Supplementary Table 6) had a direct scoring system as higher values were found to have positive effects on wetland health thereby obtaining higher scores. Conversely, other biotic indicators like status of weed infestation (WI), status of invasive plant species (IP) (Supplementary Table 5), status of invasive animal species (IA) (Supplementary Table 7), mass-death of animals in last 5 years (AD) (Supplementary Table 8), and presence of man-animal conflict (C) were given an inverse scoring system where lesser scores corresponded to higher values, as these were recognized to be unfavourable for maintaining healthy wetland conditions.

Classifying wetlands based on health status

Classification of wetlands based on their health status is very important, particularly since it provides crucial information about wetland condition to key stakeholders. For this purpose, two exercises had been conducted. Firstly, the individual indicator based scores were aggregated by summation to obtain a composite score of wetland health condition (Datta and Ghosh, 2015). Here, the composite scores

were supposed to be the best representative numerical that could depict the real ground situation of the studied wetlands individually. These obtained scores had been further classified into three broad categories based on their mean (μ) and standard deviation (σ) values (μ ± σ) to make a relative assessment among the studied wetlands.

Secondly, ordination of indicator scores were performed to analyze their patterns of association over mathematical space. Principal Component Analysis (PCA) is one such widely accepted statistical technique that can be applied on predefined wetland health indicators to recognize the independent uncorrelated factors or principal components as these hold the majority of information of the original data sets (Bro and Smilde, 2014; Datta and Deb, 2017). Here, the obtained major principal components (PC1 and PC2) derived from the PCA with Eigen value >1 were plotted in a bi-axial graph to explore the pattern of orientation of individual wetlands on the mathematical hyperspace depending on their association and characteristics (Datta and Deb, 2017). For applying PCA, the standardized data of five-point scoring system mentioned above had been used in this study. Here, all statistical analyses were performed by Microsoft Excel 2016 and its add-on XLSTAT (version 2016.4) (DasGupta and Shaw, 2015; Rani et al., 2015).

RESULTS

The fieldwork and data collection part of this study was conducted between June, 2017 and May, 2019. Additionally, information collected from secondary databases proved very useful for the selection of indicators related to the ecological health of wetlands.

Typological inventory of coastal wetlands of the study area

Focusing on the 25 selected coastal wetlands, the typological inventory was developed, which enumerated the overall wetland characteristics of the MCP region (Table 3). Initially, the wetlands with a spatial coverage of at least 2.25 ha were taken into consideration for this study, since wetlands with less than 2.25 ha area were observed exerting comparatively negligible impact on the regional environment and appeared as point features during digital mapping (Panigrahy et al., 2011; Tiner et al., 2015).

This typological inventory gave a clear understanding of the dominant geomorphic features present in each individual wetland composite. Usually, interdunal wetlands were situated at the dune swales; mudflats and mangroves were developed along the tidal creeks and tidal flats; and the salt marshes and constructed wetlands were found to be associated with the tidal channels and coastal depressions of this region. Regarding the soil characteristics of wetland composites, it was found that the soil type of interdunal wetlands was Aquents in nature. Whereas,

Table 3 Typological inventory of representative coastal wetlands of the study region; inventorization has been formulated based on Areal extent of wetland (WA), Wetland type (WC), Dominant land surface features (LF), Soil type (ST), Water type (WT), Primary source of water (WS), Presence of management organization (MO), Major livelihood option (LO), Existing threat to wetland ecosystem (ET); prevailing major livelihood options are agriculture (AGR), brackish water aquaculture (BWA), fishing (FSH), NWP collection (NCL), tourism (TRM); existing threats to wetland ecosystems are categorized as coastal erosion (COE), deforestation (DFN), eutrophication (EUT), excessive NWP collection (ENC), land use conversion (LUC), overgrazing (OGR), salinization (SLN), sewage disposal (SWD).

Wetland ID	WA (ha)	WC	LF	ST	WT	WS	MO	LO	ET
ID1–	157.68	Interdunal	Dune swale	Aquents	Fresh water	Rain water	Absent	AGR	LUC
ID2	65.39	Interdunal	Dune swale	Aquents	Brackish water	Rain water	Absent	AGR, FSH	EUT, LUC
ID3	64.58	Interdunal	Dune swale	Aquents	Fresh water	Rain water	Absent	AGR, FSH	EUT, LUC
ID4	13.44	Interdunal	Dune swale	Aquents	Fresh water	Rain water	Absent	NCL	LUC, SWD
ID5	8.30	Interdunal	Dune swale	Aquents	Fresh water	Rain water	Absent	NCL	LUC, SWD
MF1	241.55	Mudflat	Tidal creek	Albolls	Brackish water	Tidal inlet	Present	FSH, NCL	LUC, OGR
MF2	99.18	Mudflat	Tidal flat	Aquepts	Brackish water	Tidal inlet	Absent	FSH	LUC
MF3	87.47	Mudflat	Tidal flat	Aquepts	Brackish water	Tidal inlet	Absent	FSH	OGR
MF4	83.54	Mudflat	Tidal flat	Aquepts	Brackish water	Tidal inlet	Absent	FSH	LUC
MF5	45.73	Mudflat	Tidal creek	Albolls	Brackish water	Tidal inlet	Absent	FSH	LUC
MG1	893.30	Mangrove	Tidal creek	Aquepts	Brackish water	Tidal inlet	Present	FSH, NCL, TRM	COE, DFN, LUC
MG2	24.66	Mangrove	Tidal flat	Albolls	Saline water	Tidal inlet	Present	NCL	DFN, ENC
MG3	15.15	Mangrove	Tidal creek	Aqualfs	Brackish water	Tidal inlet	Present	FSH	LUC
MG4	13.20	Mangrove	Tidal flat	Aquepts	Saline water	Tidal inlet	Present	FSH	OGR
MG5	12.12	Mangrove	Tidal flat	Aqualfs	Saline water	Tidal inlet	Present	FSH	OGR
CW1	2050.05	Constructed	Coastal depression	Albolls	Brackish water	Tidal canal	Present	BWA	SLN
CW2	1165.07	Constructed	Tidal creek	Aquepts	Brackish water	Tidal canal	Present	BWA	SLN
CW3	613.08	Constructed	Coastal depression	Albolls	Brackish water	Tidal canal	Present	BWA	SLN
CW4	267.09	Constructed	Tidal creek	Albolls	Brackish water	Tidal inlet	Present	BWA	SLN
CW5	198.20	Constructed	Coastal plain	Aquepts	Brackish water	Tidal inlet	Present	BWA	SLN
SM1	523.38	Salt marsh	Coastal depression	Aquepts	Brackish water	Tidal inlet	Present	BWA, FSH	SLN
SM2	65.38	Salt marsh	Coastal depression	Aquepts	Brackish water	Tidal inlet	Absent	BWA, FSH	LUC
SM3	49.04	Salt marsh	Coastal depression	Aquepts	Brackish water	Tidal inlet	Absent	FSH	ENC
SM4	25.89	Salt marsh	Tidal creek	Aquepts	Brackish water	Tidal inlet	Absent	FSH	LUC
SM5	2.94	Salt marsh	Coastal depression	Aquepts	Brackish water	Tidal inlet	Absent	FSH	LUC

Albolls and Aquepts types of soils were usually found in mudflats and constructed wetlands. Furthermore, Aquepts, Albolls as well as Aqualfs soils predominantly appeared in mangrove wetlands and only Aquepts soils were observed in salt marshes. Genetically, Aquents, a subgroup of Entisols, are much younger in age and consist of wet sand deposits. Whereas, Albolls, a subgroup of Mollisols, are developed under the conditions of oscillating ground water flow; and are characterized by albic horizon. In contrast to these, both Aquepts and Aqualfs are poorly drained soils and recorded as the subgroups of wet Inceptisols and Alfisols respectively (FAO, 2014).

There were wide variations in aquatic characteristics from one wetland composite to the other. Interdunal wetlands were primarily found to be containing fresh water (TDS <500 mg l^{-1}). However, some of them were also covered with brackish water (TDS 1,000-10,000 mg l^{-1}). Mudflats, salt marshes and constructed wetlands were mainly occupied by brackish water. Whereas, mangroves had developed in the concurrent exposure of saline (TDS >10,000 mg l^{-1}) and brackish water. In general, this inventory also displayed the prime sources of water in these wetlands. Noticeably, interdunal wetlands were mostly found to be flooded during the monsoon and remained such until the early xeric months of November and December. However, the other four types of wetlands except this one were chiefly dependent on saline water supplied by tidal inlets.

Related socio-economic and institutional sustainability issues also added an extra dimension to this wetland inventory. Sometimes, profit and non-profit institutions such as cooperatives, civil society organizations (CSOs), and independent agencies also take on the responsibility of the sustenance of wetland dependent livelihoods and its overall ecological health. However, the involvement of such management organizations were prominent only in mangroves, constructed wetlands, and salt marshes of the study region. Whereas, interdunal wetlands and mudflats were found to be completely deprived of any of such monitoring by management organizations. These coastal wetlands also play a crucial role in livelihood generation for the local populace. Interdunal wetlands were mainly used for non-wood products (NWP) collection as well as subsistence based agriculture and fishing. Conversely, mudflats and mangroves were utilized for both the subsistence fishing and NWP collection. The mangrove wetland of Bichitrapur (MG1), however, had ecotourism as an additional prospect. Due to the advantage of saline aquatic condition, both the constructed wetlands and salt marshes were used for monospecific brackish water aquaculture. In spite of that, salt marshes had an extra provision of subsistence fishing as well. As an effect of emerging natural calamities and disgraceful economic engagements of inhabitants, coastal wetlands faced various alarming threats. Interdunal wetlands were intimidated by eutrophication, land use conversion, and sewage disposal. Whereas, Mudflats were mainly suffering from overgrazing of livestock and land use conversion. Notably, mangroves of

this region experienced numerous hazardous factors, which were: existing coastal erosion, deforestation, land use conversion, excessive NWP collection and overgrazing of livestock. Constructed wetlands were facing specific challenges from increasing alkalinity in soil, as a consequence of periodic stagnation of brackish water in the soil. Apart from that, the excessive NWP collection, rapid land use conversion and emerging soil salinity had also become the most severely injurious factors for salt marshes, situated within the study region.

Status of ecological health of studied wetlands

The composite scores representing overall wetland health conditions had been computed for the 25 selected wetlands (Table 4). Here, the higher composite scores (> μ + σ: >60.62) were found for the MF1, MF5 and MG1 wetlands as a con-

Table 4 Standardized scores of the ecological indicators

Wetland ID	Scores of ecological health indicators																	Composite score
	Physical indicators				Biochemical indicators							Biotic indicators						
	FF	DW	DL	AS	pH	DO	T	EU	FC	TD	WI	EP	IP	EA	IA	AD	C	
ID1	3	4	1	4	5	2	4	4	4	4	1	2	2	3	4	2	3	52
ID2	3	4	4	5	5	2	5	3	4	4	2	2	3	4	4	3	2	59
ID3	3	4	5	5	5	3	4	3	4	4	2	3	2	3	4	3	2	59
ID4	3	4	1	3	5	3	4	2	3	3	2	2	4	2	3	2	1	47
ID5	3	4	3	3	3	2	3	1	1	3	1	2	3	2	3	2	1	40
MF1	5	5	4	5	4	2	1	5	5	3	3	2	4	4	4	3	4	63
MF2	5	5	2	4	4	4	1	5	5	2	3	1	5	2	4	2	2	56
MF3	5	5	1	3	4	4	1	5	5	1	3	1	5	2	4	2	4	55
MF4	5	5	2	3	4	4	2	5	5	1	3	1	5	2	4	3	4	58
MF5	5	5	3	4	4	4	2	5	5	2	3	1	5	1	5	4	3	61
MG1	5	5	4	5	4	2	1	5	5	3	5	3	4	5	2	5	4	67
MG2	5	5	2	3	3	2	1	5	5	2	4	2	4	3	4	5	3	58
MG3	5	5	2	4	4	2	1	5	5	2	5	2	5	2	3	5	2	59
MG4	5	5	2	3	3	2	1	5	5	2	4	2	5	2	5	5	2	58
MG5	5	5	4	3	3	2	1	5	5	1	4	2	5	1	4	5	3	58
CW1	3	4	3	3	4	3	3	3	2	1	3	1	2	2	2	1	2	42
CW2	3	4	3	3	4	3	3	5	3	1	3	1	2	2	3	2	2	47
CW3	3	4	2	3	4	4	3	3	3	1	3	1	3	1	4	3	2	47
CW4	3	4	3	3	3	3	3	3	2	1	4	1	3	1	5	3	3	48
CW5	3	4	3	3	4	3	3	3	2	1	4	1	3	1	5	3	2	48
SM1	3	4	2	5	3	3	3	4	5	1	4	3	4	2	4	4	2	56
SM2	4	2	3	4	3	3	2	4	4	1	3	2	3	2	3	4	3	50
SM3	4	2	4	4	4	3	3	3	5	1	4	2	5	1	4	5	2	56
SM4	4	2	4	4	4	3	3	3	5	1	4	2	4	1	5	4	3	56
SM5	4	2	2	3	4	2	2	3	3	1	4	1	3	1	4	4	2	45

sequence of gaining higher scores for the majority of the physical (*i.e.* FF, DW, DL, and AS), biochemical (*i.e.* pH, DO, EU, and FC) and biotic (*i.e.* IP, EA, IA, and C) indicators. Apart from these, the moderate range (μ - σ to μ + σ) of composite scores (46.98 – 60.61) were accrued by the ID1 to ID4, MF2 to MF4, MG2 to MG5, CW2 to CW5, and SM1 to SM4 wetlands. These wetlands generally performed better with respect to some of the physical (*i.e.* FF, DW, and AS), biochemical (*i.e.* pH, DO, T, EU, and FC) and biotic (*i.e.* TD, WI, IP, IA, and AD) indicators. On the contrary, lower range of composite scores (< μ – σ: <46.97) were found for the ID5, CW1 and SM5 wetlands due to their overall lesser scores achieved against majority of the ecological indicators considered in this study.

Ecological health based ordination of studied wetlands

Application of PCA for the different indicators used to assess the 25 selected wetlands revealed that the first two principal components, *viz.* PC1 and PC2, together explained 56.48% of the total variability of the dataset. Hence, these two components had been chosen as the ideal representatives of original datasets to be used. These two principal components with Eigen value >1.00 (Eigen value: PC1 = 6.44, PC2 = 3.31) were further plotted in a bi-axial graph, where PC1 and PC2 had been ordinated in X and Y axes respectively. Based on the field observations and a priori knowledge of the investigators, it can be presumed that the degree of terrestrial remoteness and the status of ecosystem composure act as the latent variables in *x* and *y* axis respectively. This bi-axial plot thus helped to decipher few groups in respect of pattern formation for the studied wetlands on the mathematical space.

Four isolated clusters strewed into the PCA plot, which could depict four different conditions of wetland ecological health, *viz.* better, moderate, poor and alarmingly poor (Figure 2). The distinctly isolated cluster (Cluster I) formed at the first quadrant, containing MF1 and MG1, is identified as wetlands experiencing better health condition ecologically. While, another cluster (Cluster IV) situated at the fourth quadrant, containing ID1, ID2 and ID3, represented wetlands with moderate ecological health. A large cluster (Cluster II) situated at the second quadrant containing several wetlands (SM1-SM4, MG2-MG5, and MF2-MF5) had been identified as of poor ecological health. The rest of the wetlands, such as ID4, ID5; CW1-CW5; and SM5 create one separate cluster (Cluster III) in the third quadrant, and belonged to the alarmingly poor health condition. Since, PCA categorized different types of coastal wetlands in accordance to their ecological health conditions, it actually helped to comprehend the overall scenario of coastal wetland landscape of the MCP.

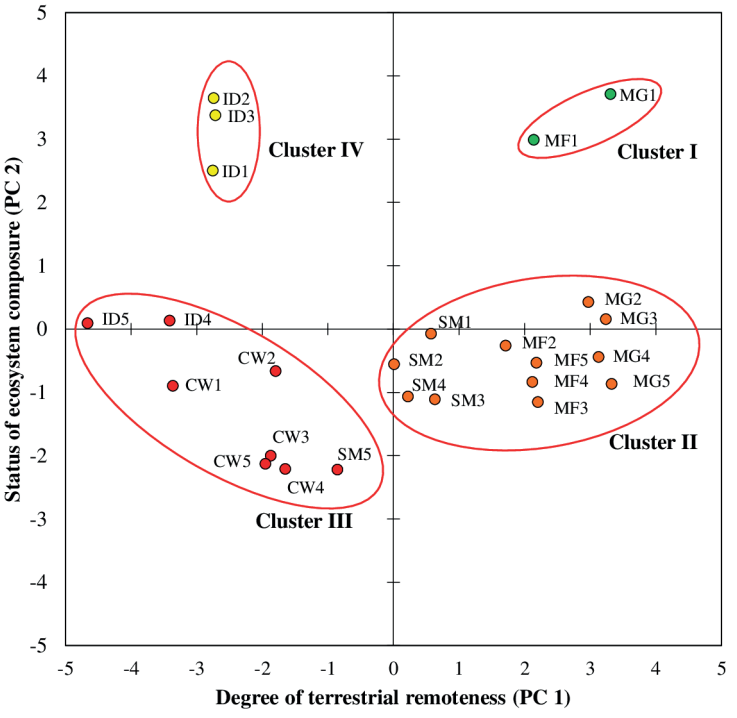


Figure 2
Ordination of studied coastal wetlands through statistical clusters in PCA bi-plot

DISCUSSION

The ecological health status of a wetland is intricately tied to several natural and anthropogenic factors associated with the coastal landscapes. Primarily, the genesis, pattern of spatial distribution, source of water and the evolutionary stage of wetlands are the prime aspects in determining the health condition of wetlands (Meng et al., 2017; Roy and Datta, 2018). Besides these, some anthropogenic agents also play vital roles in it. Dependency of local inhabitants on wetlands, specifically for their livelihood generation and related strategies to utilize the wetland resources, are such anthropogenic factors that act as the prime stressors on the wetland ecological health (Datta and Deb, 2017; Roy and Datta, 2018).

In this study, four different clusters had been identified from 25 studied wetlands with the help of PCA, denoting four different status of wetland ecological health. Among these, only two were of relatively better health condition; namely, the mudflat (MF1) near Junput and the mangrove wetland (MG1) of Bichitrapur (Figure 3). These two wetlands were also notable in terms of their areal coverages, as these two were the largest among all other naturally developed wetlands of this

region and occupied approximately 241.55 ha and 893.30 ha area respectively. In addition, due to their positional remoteness, these two wetlands were relatively undisturbed by any human induced stress, thus offering a pristine environment for its native as well as diversified wetland biota. Accordingly, minimal occurrences of man-animal conflicts and better potentiality in generation of agroecosystem (AE) services were also observed here. All these favourable conditions had eventually made these two wetlands the most ecologically resilient coastal wetlands of the MCP.

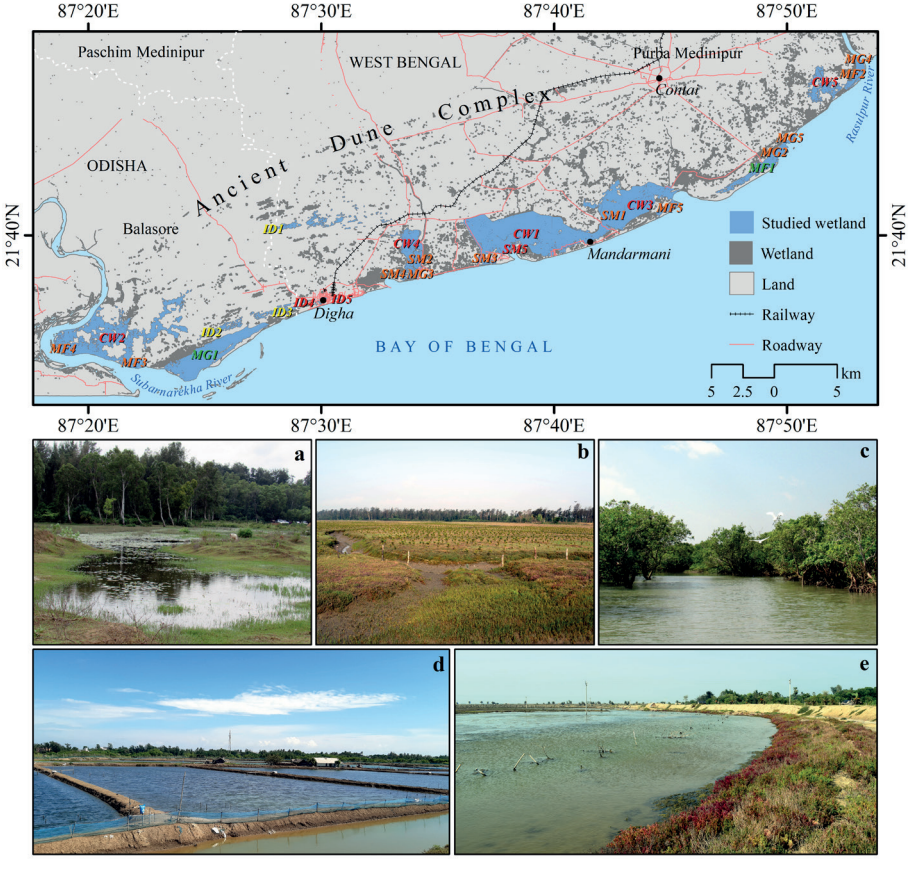


Figure 3

Spatially-explicit distribution of 25 selected coastal wetlands in terms of their ecological health through individual colour codes; shades of green, yellow, orange and red denote better, moderate, poor, and alarmingly poor ecological health condition of wetlands, respectively; bio-physically distinguishable five existing types of coastal wetlands are, *(a)* Interdunal, *(b)* Mudflat, *(c)* Mangrove, *(d)* Constructed, and *(e)* Salt marsh.

Similarly, three major interdunal wetlands (ID1, ID2, and ID3) of the study region had also succeeded in maintaining relatively better ecological health. Although these wetlands were found to be intensively harvested by local marginal farmers on a subsistence basis, a rich gamut of biota as an indirect outcome of traditional AE practices were still persisting there.

Conversely, certain wetlands were grouped together due to their alarmingly poor ecological health. Primarily, these were ID4 and ID5 interdunal wetlands; SM5 salt marsh; and CW1 to CW4 constructed wetlands. Among these, ID4 and ID5 wetlands, situated within the jurisdiction of the Digha-Sankarpur Development Authority (DSDA), frequently experienced severe contamination due to uncontrolled dumping of solid wastes and sewage disposal generated from the expanding tourism sector. Consequently, high levels of eutrophication and faecal coliform concentration had been detected in these wetlands. In contrast, the salt marsh (SM5) was suffering from DO deficiency (5.40 mg l^{-1}) and high turbidity level (86.4 NTU) in the water. Furthermore, less availability of native plants as well as animal species; unwanted existence of exotic plants species and escalating man-animal conflicts brought about by the overuse of wetland resources for aquacultural purposes by local piscators; played pivotal roles in the deteriorating health status of that salt marsh of Sankarpur. Noticeably, four selected constructed wetlands (CW1 to CW4) out of five were found suffering from poor ecological health, as the construction of these wetlands was only possible after destroying the natural habitat of numerous wetland organisms and subsequent transformation into commercial aquacultural farms. In addition, substantial amounts of arboreal vegetation at the wetland peripheral areas, increasing infestation of weeds within wetlands, and the absence of native animal species; also act as the influencing factors behind the poor ecological health of these wetlands. During the field investigation, some exotic plant species such as *Calotropis gigantean*, *Opuntia stricta*, *Pistia stratiotes* and *Portulaca oleracea* were spotted in various sites in and around these wetlands. These exotic plant or animal species may prove to be detrimental to the associated native species, if they destroy and occupy the natural habitat of the native species in the imminent years.

The remaining 12 coastal wetlands such as SM1 to SM4, MF2 to MF5 and MG2 to MG5 belonged to the group displaying moderate ecological health status. Salt marshes and mudflats generally had lower biological diversity in spite of lesser human intervention. Similarly, the mangrove wetlands of the entire MCP, except Bichitrapur, were observed to be in a very early stage of ecological succession and, therefore, were also incapable of supporting a rich biodiversity. Hence, other than Bichitrapur, all other mangrove wetlands belong to moderate ecological health status. Notably, some endangered native plant species like *Pandanus tectorius*, *Salicornia europaea*, *Cyperus arenarius* and *Cyperus stoloniferus* were still spotted in these moderately healthy wetland composites during the field surveys.

After evaluating all the applied physical, chemical and biotic health indicators of wetlands together, it was observed that the degree of human induced stresses and the existing wetland biological diversity were the most explicit determinants of wetland ecological health in the study region.

CONCLUSIONS

The present study tried to demonstrate the variety of coastal wetlands present in the study region emphasizing on their physical characteristics as well as the existing ecological health status. Established international wetland inventorization system, widely accepted national level wetland inventory, primary field based survey data, and secondary records on physical environment were merged together to attain the objectives of this study.

No such regional wetland inventory for the MCP, with special reference to their ecological health condition, had been prepared till date. Consequently, this study on regional level wetland inventorization will certainly offer better solutions to the decision making problems of many stakeholders, researchers, and policy makers towards forwarding any sustainable management plan for these wetlands. However, the relative ecological health status of the studied wetlands derived here was only pertinent for the MCP. This might differ for other coastal areas since the physicochemical characteristics and the corresponding biotic characteristics would substantially change based on geographic variance (Roy and Datta, 2018).

In accordance to the ecological indicator based clustering, it can be concluded that intertidal wetlands such as mangroves and mudflats with remote locational advantages hold the most optimum ecological health status within the MCP. Moreover, some of the interdunal wetlands had also succeeded in maintaining a healthy ecological condition through generation of AE potentiality brought about by traditional subsistence farming practices. Evidently, most of the wetlands, which had been used indiscriminately and even neglected by the local authorities, often failed to retain their ecological composure. Noticeably, few of the interdunal wetlands, most of the constructed wetlands, and certain stretches of salt marshes were found to be severely suffering from deteriorated ecological conditions and subsequently needed intensive restoration measures from active as well as passive users in an immediate basis. This can only be achieved through a synergic endeavour between human and nature that can uphold the diversified ecological functions as well as make provisions of wetland resources for the rural masses.

Acknowledgement

We are extremely grateful to all of those local villagers and wetland users who provided valuable information during field investigations. This research work is conducted with the financial support received by the corresponding author from the Science and Engineering Research Board, Department of Science & Technology (DST-SERB), Government of India (SERB Sanction No. ECR/2017/003380, dated 26.11.2018).

REFERENCES

ALEXAKIS, D., TSIHRINTZIS, V. A., TSAKIRIS, G., GIKAS, G. D. (2016). Suitability of water quality indices for application in lakes in the Mediterranean. *Water Resources Management,* 30, 1621-1633. https://doi.org/10.1007/s11269-016-1240-y

ALLEN, J. R. (2000). Morphodynamics of Holocene salt marshes: a review sketch from the Atlantic and southern North Sea coasts of Europe. *Quaternary Science Reviews,* 19, 12, 1155-1231. https://doi.org/10.1016/S0277-3791(99)00034-7

BACHMANN, R. W., HOYER, M. V., CROTEAU, A. C., CANFIELD, D. E. (2017). Factors related to Secchi depths and their stability over time as determined from a probability sample of US lakes. *Environmental Monitoring and Assessment,* 189, 206, 1-17. https://doi.org/10.1007/s10661-017-5911-9

BARBIER, E. B., HACKER, S. D., KENNEDY, C., KOCH, E. W., STIER, A. C., SILLIMAN, B. R. (2011). The value of estuarine and coastal ecosystem services. *Ecological Monographs,* 81, 2, 169-193. https://doi.org/10.1890/10-1510.1

BARTLETT, D., GOMEZ-MARTIN, E., MILLIKEN, S., PARMER, D. (2017). Introducing landscape character assessment and the ecosystem service approach to India: a case study. *Landscape and Urban Planning,* 167, 257-266. https://doi.org/10.1016/j.landurbplan.2017.06.013

BASSI, N., KUMAR, M. D., SHARMA, A., PARDHA-SARADHI, P. (2014). Status of wetlands in India: a review of extent, ecosystem benefits, threats and management strategies. *Journal of Hydrology: Regional Studies,* 2, 1-19. https://doi.org/10.1016/j.ejrh.2014.07.001

BORCHERT, S. M., OSLAND, M. J., ENWRIGHT, N. M., GRIFFITH, K. T. (2018). Coastal wetland adaptation to sea level rise: quantifying potential for landward migration and coastal squeeze. *Journal of Applied Ecology,* 55, 6, 2876-2887. https://doi.org/10.1111/1365-2664.13169

BRO, R., SMILDE, A. K. (2014). Principal component analysis. *Analytical Methods,* 6, 9, 2812-2831. https://doi.org/10.1039/C3AY41907J

CAHOON, D. R., HENSEL, P. F., SPENCER, T., REED, D. J., MCKEE, K. L., SAINTILAN, N. (2006). Coastal wetland vulnerability to relative sea-level rise: wetland elevation trends and process controls. In Verhoeven, J. T. A., Beltman, B., Bobbink, R., Whigham, D. F., eds., *Wetlands and Natural Resource Management*. Berlin: Springer, pp. 271-292.

CHAKRABARTI, P. (1991). Subarnarekha delta – a geomorphic appraisal. *Memoir of the Geological Society of India,* 22, 25-30.

CHAKRABARTI, P. (1995). Evolutionary history of the coastal quaternaries of the Bengal plain, India. *Proceedings-Indian National Science Academy,* 61, 343-354.

CHAKRABARTI, P., NAG, S. (2015). *Rivers of West Bengal – changing scenario*. West Bengal: Department of Science and Technology, Government of West Bengal.

CHAKRABORTY, S. K. (2010). Coastal environment of Midnapore, West Bengal: potential threats and management. *Journal of Coastal Environment,* 1, 1, 27-40.

CHAKRABORTY, S. K. (2017). Ecological services of intertidal benthic fauna and the sustenance of coastal wetlands along the Midnapore (East) Coast, West Bengal, India. In Finkl, C. W., Makowski, C., eds., *Coastal Wetlands: Alteration and Remediation*. Cham: Springer, pp. 777-866.

CHUNYE, W., DELU, P. (2017). Zoning of Hangzhou Bay ecological red line using GIS-based multi-criteria decision analysis. *Ocean & coastal management*, 139, 42-50. https://doi.org/10.1016/j.ocecoaman.2017.01.013

DASGUPTA, R., SHAW, R. (2015). An indicator based approach to assess coastal communities' resilience against climate related disasters in Indian Sundarbans. *Journal of Coastal Conservation,* 19, 85-101. https://doi.org/10.1007/s11852-014-0369-1

DATTA, D., CHATTOPADHYAY, R. N., GUHA, P. (2012). Community based mangrove management: a review on status and sustainability. *Journal of Environmental Management,* 107, 84-95. https://doi.org/10.1016/j.jenvman.2012.04.013

DATTA, D., DEB, S. (2012). Analysis of coastal land use/land cover changes in the Indian Sunderbans using remotely sensed data. *Geo-spatial Information Science,* 15, 4, 241-250. https://doi.org/10.1080/10095020.2012.714104

DATTA, D., DEB, S. (2017). Forest structure and soil properties of mangrove ecosystems under different management scenarios: experiences from the intensely humanized landscape of Indian Sunderbans. *Ocean & Coastal Management,* 140, 22-33. https://doi.org/10.1016/ j.ocecoaman.2017.02.022

DATTA, D., GHOSH, P. K. (2015). Evaluating sustainability of community endeavours in an Indian floodplain wetland using multi-criteria decision analysis. *Singapore Journal of Tropical Geography,* 36, 1, 38-56. https://doi.org/10.1111/sjtg.12092

DISTEFANO, E. (2005). Human-wildlife conflict worldwide: collection of case studies, analysis of management strategies and good practices. Retrieved from: https://www.tnrf.org/files/E-INFO-Human-Wildlife_Conflict_worldwide_case_studies_by_Elisa_Distefano_no_date.pdf. Accessed on 2 October 2019.

DUTTA, D., DAS, C. S., KUNDU, A. (2016). A geo-spatial study on spatio-temporal growth of brackish water aquaculture along the coastal areas of West Bengal (India). *Modeling Earth Systems and Environment,* 2, 1-10. https://doi.org/10.1007/s40808-016-0109-7

DUTTA, D., DAS, C. S., KUNDU, A. (2016). A geo-spatial study on spatio-temporal growth of brackish water aquaculture along the coastal areas of West Bengal (India). *Modeling Earth Systems and Environment*, 2, 2, 1-10. https://doi.org/10.1007/s40808-016-0109-7

ENVIS CENTER ON FLORAL DIVERSITY, (2016). Coastal plants. Retrieved from: http://www.bsienvis.nic.in/Database/CoastalPlants_3944.aspx. Accessed on 23 February 2019.

FAO. (2014). *World reference base for soil resources 2014 - international soil classification system for naming soils and creating legends for soil maps*. Rome, Italy: Food and Agriculture Organization of the United Nations.

FRETWELL, J. D., WILLIAMS, J. S., REDMAN, P. J. (1996). *National water summary on wetland resources*. Washington, DC: United State Geological Survey.

IUCN. (2020). The IUCN red list of threatened species (Version 2019-3). Retrieved from: https://www.iucnredlist.org/. Accessed on 23 February 2019.

JAKOBSSON, S., LINDBORG, R. (2017). The importance of trees for woody pasture bird diversity and effects of the European Union's tree density policy. *Journal of Applied Ecology,* 54, 6, 1638-1647. https://doi.org/10.1111/1365-2664.12871

JAYANTHI, M., THIRUMURTHY, S., MURALIDHAR, M., RAVICHANDRAN, P. (2018). Impact of shrimp aquaculture development on important ecosystems in India. *Global Environmental Change*, 52, 10-21. https://doi.org/10.1016/j.gloenvcha.2018.05.005

JI, L., ZHANG, L., WYLIE, B. (2009). Analysis of dynamic thresholds for the normalized difference water index. *Photogrammetric Engineering & Remote Sensing,* 75, 11, 1307-1317. https://doi.org/10.14358/PERS.75.11.1307

JIANG, Y. J., HE, W, LIU, W. X., QIN, N., OUYANG, H. L., WANG, Q. M., KONG, X. Z., HE, Q. S., YANG, C., YANG, B., XU, F. L. (2014). The seasonal and spatial variations of phytoplankton community and their correlation with environmental factors in a large eutrophic Chinese lake (Lake Chaohu). *Ecological Indicators,* 40, 58-67. https://doi.org/10.1016/j.ecolind.2014.01.006

JØRGENSEN, S. E., COSTANZA, R., XU, F. L. (2005). *Ecological indicators for assessment of ecosystem health*. USA: Taylor and Francis Group.

KAPLAN, G., AVDAN, U. (2017). Mapping and monitoring wetlands using Sentinel-2 satellite imagery. *ISPRS Annals of the Photogrammetry, Remote Sensing and Spatial Information Sciences,* 4, 271-277. https://dx.doi.org/10.5194/isprs-annals-IV-4-W4-271-2017

KENNISH, M. J. (2002). Environmental threats and environmental future of estuaries. *Environmental Conservation,* 29, 1, 78-107. https://doi.org/10.1017/S0376892902000061

KIRWAN, M. L., MEGONIGAL, J. P. (2013). Tidal wetland stability in the face of human impacts and sea-level rise. *Nature,* 504, 53-60. https://doi.org/10.1038/nature12856

KRUEGER, R. A. (2014). *Focus groups: a practical guide for applied research*. USA: Sage Publications.

KULELI, T., GUNEROGLU, A., KARSLI, F., DIHKAN, M. (2011). Automatic detection of shoreline change on coastal Ramsar wetlands of Turkey. *Ocean Engineering,* 38, 10, 1141-1149. https://doi.org/10.1016/j.oceaneng.2011.05.006

KUMARAN, M., GHOSHAL, T. K., DE, D., BISWAS, G., RAJA, R. A., ANAND, P. S., PANIGRAHI, A., VIJAYAN, K. K. (2020). Aquaculture-based production systems for the livelihood security of coastal farm families in the risk-prone agro-ecosystem of India: an appraisal. *Aquaculture International*, 28, 2, 805-814. https://doi.org/10.1007/s10499- 019-00495-y

LABA, M., DOWNS, R., SMITH, S., WELSH, S., NEIDER, C., WHITE, S., RICHMOND, M., PHILPOT, W., BAVEYE, P. (2008). Mapping invasive wetland plants in the Hudson River National Estuarine Research Reserve using Quickbird satellite imagery. *Remote Sensing of Environment,* 112, 1, 286-300. https://doi.org/10.1016/j.rse.2007.05.003

LANGERWISCH, F., VÁCLAVÍK, T., VON BLOH, W., VETTER, T., THONICKE, K. (2017). Combined effects of climate and land-use change on the provision of ecosystem services in rice agro-ecosystems. *Environmental Research Letters*, 13, 1, 1-12. https://doi.org/10.1088/ 1748-9326/aa954d

LEE, S. Y., DUNN, R. J. K., YOUNG, R. A., CONNOLLY, R. M., DALE, P. E. R., DEHAYR, R., LEMCK-ERT, C. J., MCKINNON, S., POWELL, B., TEASDALE, P. R., WELSH, D. T. (2006). Impact of urbanization on coastal wetland structure and function. *Austral Ecology,* 31, 2, 149-163. https://doi.org/10.1111/j.1442-9993.2006.01581.x

LESCOURRET, F., MAGDA, D., RICHARD, G., ADAM-BLONDON, A. F., BARDY, M., BAUDRY, J., DOUSSAN, I., DUMONT, B., LEFÈVRE, F., LITRICO, I., MARTIN-CLOUAIRE, R., MONTUELLE, B., PELLERIN, S., PLANTEGENEST, M., TANCOIGNE, E., THOMAS, A., GUYOMARD, H., SOUSSANA, J. F. (2015). A social-ecological approach to managing multiple agro-ecosystem services. *Current Opinion in Environmental Sustainability,* 14, 68-75. https://doi.org/10.1016/ j.cosust.2015.04.001

LI, N., LU, D., WU, M., ZHANG, Y., LU, L. (2018). Coastal wetland classification with multiseasonal high-spatial resolution satellite imagery. *International Journal of Remote Sensing*, 39, 23, 8963-8983.

LILLESAND, T. M., KIEFER, R. W., CHIPMAN, J. W. (2008). *Remote sensing and image interpretation*. USA: John Wiley and Sons.

MAJUMDAR, D., CHAKRABORTY, S., SAHA, S., DATTA, D. (2019). Geospatial analysis of the effects of tsunami on coral and mangrove ecosystems of Mayabunder in Andaman islands, India. *Brazilian Journal of Oceanography,* 67, 1-10. https://doi.org/10.1590/s1679 -87592019025806715

MCCARTHY, M. J., RADABAUGH, K. R., MOYER, R. P., MULLER-KARGER, F. E. (2018). Enabling efficient, large-scale high-spatial resolution wetland mapping using sa-

tellites. *Remote Sensing of Environment,* 208, 189-201. https://doi.org/10.1016/j.rse.2018.02.021

MCFEETERS, S. K. (1996). The use of Normalized Difference Water Index (NDWI) in the delineation of open water features. *International Journal of Remote Sensing*, 17, 7, 1425-1432. https://doi.org/10.1080/01431169608948714

MENG, W., HE, M., HU, B., MO, X., LI, H., LIU, B., WANG, Z. (2017). Status of wetlands in China: a review of extent, degradation, issues and recommendations for improvement. *Ocean & Coastal Management,* 146, 50-59. https://doi.org/10.1016/j.ocecoaman. 2017.06.003

MOEF. (2011). *Critically endangered animal species of India*. India: Zoological Survey of India, Government of India.

MORRIS, J. T., SUNDARESHWAR, P. V., NIETCH, C. T., KJERFVE, B., CAHOON, D. R. (2002). Responses of coastal wetlands to rising sea level. *Ecology,* 83, 10, 2869-2877. https://doi.org/10. 1890/0012-9658(2002)083[2869:ROCWTR]2.0.CO;2

NAYAK, S., BAHUGUNA, A. (2001). Application of remote sensing data to monitor mangroves and other coastal vegetation of India. *Indian Journal of Geo-Marine Sciences,* 30, 4, 195-213.

NIYOGI, D. (1975). Quaternary geology of the coastal plain of West Bengal and Orissa. *Indian Journal of Earth Sciences,* 2, 51-61.

NOWACKI, D. J., OGSTON, A. S. (2013). Water and sediment transport of channel-flat systems in a mesotidal mudflat: Willapa Bay, Washington. *Continental Shelf Research,* 60, 111-124. https://doi.org/10.1016/j.csr.2012.07.019

NRSA. (2007). *National land use and land cover mapping using multi-temporal AWiFS data*. Hyderabad, India: National Remote Sensing Agency.

PANIGRAHY, S., PATEL, J. G., MURTHY, T. V. R., SINGH, T. S. (2011). *Information brochure – National Wetland Inventory and Assessment*. Ahmedabad: Space Applications Centre, ISRO.

RAGAVAN, P., KATHIRESAN, K., MOHAN, P. M., RAVICHANDRAN, K., JAYARAJ, R. S. C., RANA, T. S. (2020). Ensuring the adaptive potential of Coastal wetlands of India-the need of the hour for sustainable management. *Wetlands Ecology and Management*, 1-12. https://doi.org/10.1007/s11273-020-09742-z

RANI, N. S., SATYANARAYANA, A. N. V., BHASKARAN, P. K. (2015). Coastal vulnerability assessment studies over India: a review. *Natural Hazards,* 77, 1, 405-428. https://doi.org/ 10.1007/s11069-015-1597-x

ROY, A. K., DATTA, D. (2018). Analyzing the effects of afforestation on estuarine environment of river Subarnarekha, India using geospatial technologies and participatory appraisals. *Environmental Monitoring and Assessment,* 190, 1-16. https://doi.org/10.1007/s10661 -018-7030-7

ROY, A. K., MITRA, S. (2019). Assessment of planform dynamics and anthropogenic stresses in the Balari Island, Hooghly estuary, India. *Spatial Information Research,* 28, 2, 227-239. https://doi.org/10.1007/s41324-019-00281-1

RUNNING, G., HAVHOLM, K., BOYD, M., WISEMAN, D. (2002). Holocene stratigraphy and geomorphology of Flintstone Hill, Lauder Sandhills, Glacial Lake Hind Basin, southwestern Manitoba. *Géographie Physique et Quaternaire,* 56, 2-3, 291-303. https://doi.org/ 10.7202/009112ar

SAID, A., STEVENS, D. K., SEHLKE, G. (2004). An innovative index for evaluating water quality in streams. *Environmental Management,* 34, 3, 406-414. https://doi.org/ 10.1007/s00267-004-0210-y

SCOTT, D. A., JONES, T. A. (1995). Classification and inventory of wetlands: a global overview. *Vegetatio,* 118, 3-16. https://doi.org/10.1007/BF00045186

SECRETARIAT OF THE RAMSAR CONVENTION, (2010). Handbook 15: wetland inventory, 4th edition, Gland, Switzerland. Retrieved from: https://www.ramsar.org/sites/ default/files/ documents/pdf/lib/hbk4-15.pdf. Accessed on 13 December 2018.

SERAFY, J. E., VALLE, M., FAUNCE, C. H., LUO, J. (2007). Species-specific patterns of fish abundance and size along a subtropical mangrove shoreline: an application of the delta approach. *Bulletin of Marine Science,* 80, 3, 609-624.

SHALABY, A., TATEISHI, R. (2007). Remote sensing and GIS for mapping and monitoring land cover and land use changes in the northwestern coastal zone of Egypt. *Applied Geography,* 27, 1, 28-41. https://doi.org/10.1016/j.apgeog.2006.09.004

SIEVERS, M., HALE, R., PARRIS, K. M., SWEARER, S. E. (2018). Impacts of human-induced environmental change in wetlands on aquatic animals. *Biological Reviews,* 93, 1, 529-554. https://doi.org/10.1111/brv.12358

SINAGA, D. M., ROBSON, M. G., GASONG, B. T., HALEL, A. G., PERTIWI, D. (2016). Faecal coliform bacteria and factors related to its growth at the Sekotong shallow wells (West Nusa Tenggara, Indonesia). *Public Health of Indonesia,* 2, 2, 47-54. https:// doi.org/ 10.36685/phi.v2i2.62

SMITH, V. H. (2003). Eutrophication of freshwater and coastal marine ecosystems a global problem. *Environmental Science and Pollution Research,* 10, 2, 126-139. https://doi.org/ 10.1065/ espr2002.12.142

TINER, R. W., LANG, M. W., KLEMAS, V. V. (2015). *Remote sensing of wetlands: applications and advances*. USA: CRC Press.

TOMITA, S., MIYAGAMA, S., KONO, Y., NOICHANA, C., INAMURA, T., NAGATA, Y., SRIBUTTA, S., NAWATA, E. (2003). Rice yield losses by competition with weeds in rainfed paddy fields in north-east Thailand. *Weed Biology and Management,* 3, 3, 162-171. https://doi.org/10.1046/ j.1445-6664.2003.00101.x

TRAN, T., JAMES, H. (2017). Transformation of household livelihoods in adapting to the impacts of flood control schemes in the Vietnamese Mekong Delta. *Water Resources and Rural Development,* 9, 67-80. https://doi.org/10.1016/j. wrr.2017.04.002

TRIPATHY, M. (2012). Biodiversity of Chilika and its conservation, Odisha, India. *International Research Journal of Environmental Sciences,* 1, 54-57.

VENKATARAMAN, K. (2008). Coastal and marine wetlands in India. In *Proceedings of the Taal 2007: The 12th World Lake Conference, Jaipur, Rajasthan*. India: Ministry of Environment and Forests, Government of India.

WAL, A., MCMANUS, J. (1993). Wind regime and sand transport on a coastal beach-dune complex, Tentsmuir, eastern Scotland. In Pye, K., ed., *The Dynamics and Environmental Context of Aeolian Sedimentary Systems*. London: Geological Society, pp. 159-171.

WU, W., YANG, Z., TIAN, B., HUANG, Y., ZHOU, Y., ZHANG, T. (2018). Impacts of coastal reclamation on wetlands: loss, resilience, and sustainable management. *Estuarine, Coastal and Shelf Science,* 210, 153-161. https://doi.org/10.1016/j.ecss.2018.06.013

FOLIA GEOGRAPHICA • ISSN 1336-6157 (hard copy) • ISSN 2454-1001 (online)

'HERSTORY' IN HISTORY: A PLACE OF WOMEN IN UKRAINIAN URBAN TOPONYMY

Oleksiy GNATIUK [A*], Victoria GLYBOVETS [B]

Received: July 20, 2020 | Revised: September 1, 2020 | Accepted: September 19, 2020
Paper No. 20-62/2-562

Abstract
The paper addresses the issue of gender equality in urban toponymy – the equal right of women along with men to be commemorated in urban streetscape and thus to be perceived as a full-fledged actor of history. Today, the process of street naming typically reflects masculinist bias resulting in far fewer streets being named in honour of women than men. Despite a growing interest in examining how street naming and related toponymic practices are implicated in the gendering of urban space, toponymic gender inequalities still remain understudied in different cultural and geopolitical contexts. Focusing on the case of Ukraine, geopolitically-divided post-Soviet country with contingent and contradictory memory policy, we show that contemporary toponymic gender disparities in the cities in Ukraine are similar to those observed in other European countries, but the specificity is expressed in a different structure and historical dynamics of female urbanonyms. The study of Ukrainian female street names was carried out on the basis of 41 largest cities covering all administrative regions. A number of indicators were calculated to evaluate the changes in the quantity and share of female urban toponymy in the period after the Soviet Union collapse. The structure of commemorated female personalities by professions and activities was determined as well. Special attention, including in-depth historical overview, was paid to the three cases representing different historical and cultural background – Lviv (west), Kyiv (centre) and Kharkiv (east). Existing regional differences are explained by (geo)political divisions as well as economic and cultural factors. Recent policy of decommunization has had ambiguous effect on the gender proportions of urban toponymy: although a lot of new female names were introduced, Communist female names have disappeared contributing to growing toponymic gender imbalance in some cities.

Key words
Urban toponymy, female urbanonyms, commemoration of women, gender equality, Ukraine.

INTRODUCTION

Gender equality refers to the equal rights, responsibilities and opportunities of women and men. It provides for the equal valuing by society of the similarities and the differences of men and women, and the roles they play in the home, community

A* Taras Shevchenko National University of Kyiv, Kyiv, Ukraine
alexgnat22@ukr.net (corresponding author)
B Taras Shevchenko National University of Kyiv, Kyiv, Ukraine
victoriasatiya@gmail.com

and society. Gender gap is a disproportionate difference between men and women, particularly as reflected in attainment of development goals, access to resources and levels of participation; a gender gap indicates gender inequality. Gender parity is a numerical concept concerning relative equality in terms of numbers and proportions of men and women (Mediterranean Institute of Gender Studies, 2009).

This common modern-day approach refers also to the fundamental right of women to be a full-fledged actor of history on an equal footing with men, and be perceived as such, which implies the equal right to be commemorated, including in streetscape. In this way street naming is implicated in the gendering of urban space and reflects perceived roles of men and women in history. The commemorative work that street naming performs not only naturalizes and legitimizes selective visions of the past but is also instrumental in spatializing the social boundaries of belonging and exclusion along various societal axes, including gender (Alderman and Inwood, 2017). More often than not, the street naming process has been dominated by masculinist policy agendas resulting in far fewer streets being named in honour of women than men in cities around the world (Rose-Redwood, Alderman, and Azaryahu, 2017), in this manner writing city-text as merely exclusively 'hisstory', but not 'herstory'. Due to the manner in which gender roles were socially constructed, it appears that the social organization empowered men to play the most memorable roles of history, while feminine roles have been long ascribed to the private sphere of life; this explanation could account for the unequal division between men and women in naming streets (Niculescu-Mizil, 2014).

World geographical thought, affected by postmodern discontinuity (Matlovič and Matlovičová, 2020), increasingly tends to consider urban streetscape as a space where different visions of the past collide in the present and competing spatial imaginaries are juxtaposed; streetscapes are scrutinized as contested arenas in which struggles over identity, memory, and place shape the social production of urban space (Rose-Redwood, Alderman, and Azaryahu, 2017). However, despite growing interest in examining how street naming and related toponymic practices are implicated in the gendering of urban space, toponymic gender inequalities still remain understudied. In particular, we are referring to the models and factors of gender toponymic policy in different cultural and geopolitical contexts, including postcolonial, post-socialist and geopolitically divided societies. Available data from around the world are still lacking for comprehensive comparative research. The Ukrainian case on which we focus in this paper is still unexamined and yet indicative, as it provides an opportunity to explore and understand gender disparities in the toponymy of the post-Soviet geopolitically divided country (Barrington and Herron, 2004; Rexhepi, 2017) with contingent and contradictory memory policy (Shevel 2011; Portnov 2013). Obviously, the communist concept of woman emancipation should have influenced both approaches to commemoration of women and gender balances in toponymy in post-Soviet countries on the global back-

ground. Simultaneously, accentuated memory policy in Communist era should have induced a distinct ideological bias in female street names. On the other hand, we cannot omit a debatable question whether post-Soviet democratic period, marked with decommunization of streetscape and parallel development of the new memory policy, contributed to the levelling of gender imbalance. Therefore, the aim of this paper is to analyze the visibility of women in the urban toponymy of Ukraine, paying special attention to spatial (regional) patterns of commemorating women in streetscape and existing gender imbalance in view of cultural and (geo) political history of the country.

SCIENTIFIC BACKGROUND

Studies of gender disparities in urban toponymy have so far been carried out not so much by professional scholars as by journalists and concerned activists or initiative groups, and the latter are more and more eager to move from theories and empirical facts to practice in order to reduce existing gender gap in urban streetscape.

In 2012, Maria Pia Ercolini and her team examined 16,550 streets in Rome to determine the gender balance. They found that just 3.5% of the city's streets were named after women comparing with 45.7% named after men. To redress the balance, she proposed to name new streets in Rome after women rather than to rename existing streets since the latter approach would be very unpopular. Inspired by the Italian project, a group of women in Spain surveyed Madrid's streets. It fared a bit better than Rome, with nearly 7% of streets named after women, and 27% after men (Bosworth, 2012). However, most of the female commemorations in Spain are those of saints or nuns, while the second largest group consists of queens and the wives of public personages (Tojo, 2015).

An interactive map from Mapbox developer Aruna Sankaranarayanan and her colleagues showed how scarce female streets are in seven major cities around the world. The team tried to filter out all neutral names so they could get a clearer sense of the true gender balance. They found that, on average, only 27.5% of the studied streets had female names (Poon, 2015).

In August 2015, a feminist group in France "Osez le Féminisme!" renamed the streets of Paris after noting that just 2.6 percent are named after notable women, and more than a half of those 166 women have been honoured only because they were wives or daughters of famous men. The group created their own version of the street signs and stuck them over the official names. To do it, the group used a list of French women scientists, artists and politicians that should have a street named after them. The group has asked that by 2019, as many women as men are honoured by having their names given to the streets of Paris (O'Connor, 2015; Jaffe, 2015).

In 2017, on International Women's Day, Geneva's parliament voted in favour of naming more streets in the canton after women, proposing an increased "feminization" of street names. According to the text of the bill, only 31 out of 700 streets that have the name of a famous person are named after women, equating to just one percent of the total 3,263 streets in the canton (The Local, 2017).

Journalists from H-Alter concluded that cities in Croatia still reflect a patriarchal system, based on the idea that women's place is at home. Of 64 cities, included in analysis, only 9 had the percentage of streets named after women equal to or greater than 5%. In almost half of the cities analysed, including some of the biggest cities in the country, less than 2% of streets were named after women, and in 11 cities there was not a single street named after women (Perić and Kuzmanić, 2018).

In Bradford, Great Britain, the council's campaign aims to further improve the gender balance and promote the important role of women in the city's history. That is why more streets and public spaces in Bradford are to be named after women in a move to recognize female achievement. As the councillor said, 'We hope to inspire young women across the district to go on and make their own history' (BBC, 2019).

In December 2019, the European Economic and Social Committee awarded first prize in the sphere of gender equality to the Italian organisation 'Women's Toponymy' for activities aimed at giving women public recognition by raising awareness about their contribution to society and history. Believing that toponymy is a good indicator of the way a society values its members, the organisation is trying to put more notable women on city and town maps. Its recent research into the names of public places in about 90% of Italian municipalities has shown that for every 100 streets named after men and only 7.8 were named after women, of which some 60% referred to religious figures. There are almost no places featuring the names of notable female scientists, entrepreneurs, artists and sportswomen and Women's Toponymy is set to change that (European Economic and Social Committee, 2019).

In Ukraine, the issue of gender proportions in urban toponymy is also increasingly raised in the media riding the wave of increased interest to toponymy in connection with the ongoing decommunization process. Publications in media has criticized the dominant masculinity of streetscape appear address different categories of settlements: from biggest cities like Dnipro (Shrub, 2018), Lviv (Vysokolian, 2016) Ivano-Frankivsk (Bondarev, 2011) or Kropyvnytskyi (Semeniuk, 2017) to medium-sized cities like Kalush (Onyskiv, 2018) or even small townships like Biliaivka (Khalymonyk, 2018). Some contributions, in addition to the review of a single case city, contain elements of a comparative analysis of several cities (Steblyna, 2013). The authors of these and other investigative reports conclude about striking disparities between the number of male and female personal street

names (Khalymonyk, 2018), emphasizing that 'more streets are named after trees and flowers than in honour of women' (Steblyna, 2013; Semeniuk, 2017), as well as the detachment of female names from the local historical and cultural context in most cases (Shrub, 2018). They also tried to explore historical trends of the origin of female street names and explain existing gender disparities (Bondarev, 2011; Semeniuk, 2017). In particular, street names mostly reflect the history of various wars and conquests, so they represent the activities of a predominantly male half of society. However, even among the commemorated cultural figures men predominate as well. Thus, the current situation is a consequence of both historical discrimination and the lack of a real state gender policy (Semeniuk, 2017). It is noted that although the names of female revolutionaries and Communists were erased via decommunization process, the number of female names on the city map increased due to the revival of the memory of prominent women forgotten for various reasons in the XX century, in particular those having relations to the specific city (Vysokolian, 2016; Onyskiv, 2018; Shrub, 2018). However, gender equality in the urban toponymy is still long way off (Shrub, 2018).

Such media reports and acts of resistance notwithstanding, the study of the gender politics of street naming is still a woefully neglected theme in urban studies and critical toponymic scholarship (Rose-Redwood, Alderman, and Azaryahu, 2017). However, our investigation feeds upon certain contributions focusing on European cases and dealing with gender inequalities predominantly through the lens of local or national cultural context and paying attention to the urban space axiology as a key to understanding gender disparities in toponymy.

In particular, De Soto (1996) addressed feminist aspects of the controversy over the post-socialist street naming purification policy in East Berlin. Niculescu-Mizil (2014) applied gender sensitive approach investigating (re)naming streets in Bucharest, which revealed an unequal distribution among genders in favor of men. Neaga (2014) came to similar conclusions via the analysis of street names and memorial plaques in Bucharest. Nada (2014), analyzing the street names in Belgrade, points out on distinctive, even though implicitly inherited difference in power distribution and gender based standings in social organization of the space. At the same time, the study showed that the change of female street names expresses the ideological changes and the need of classes and strata which tend to establish their social position by changing the view on history in order to consolidate their own legitimization.

The study of the urban toponymy of the regional cities of Slovakia (Bucher et al. 2013a, 2013b) showed that gender emancipation is a notable phenomenon regarding the names of the streets after personalities, with female street names making up only 5% of the total streets having such names. Almost 75% of commemorated women represent the realm of art and culture. In some cities (Trenčín,

Prešov) female street names were not found at all; however, only historical cores of the cities were taken into consideration.

Novas-Ferradás (2018) studied gender inequality through a study of Santiago de Compostela's urban anthroponymy. She found a substantial gender gap, with the number of celebrated masculine figures being triple the number of feminine ones (9.2% against 27.1%). Moreover, the vast majority of feminine urban toponyms referred to religious figures, mostly saints, virgins, etc. This pattern correlates to the classical female role in a traditionally Catholic state like Spain: a woman must be devout, submissive and passive. On the contrast, masculine figures names primarily refer to men with positions of economic or political power or reputable intellectuals, with a greater variety of occupations than the women represented. Also, the contribution provides a brief comparison of the Compostela case with other major Spanish cities.

Walkowiak (2020) focused on the visibility of women in the names of streets in 12 Polish cities with the highest number of hodonyms. She found that the share of female street names among all personal commemorative names in analyzed cities fluctuated in the range from 5.7% to 13.4%. However, this percentage is raised by the relatively high proportion of names of fictitious female characters, while disregarding the names of saints reveals an even greater gender imbalance. The differences in proportion and composition of commemorated female names among particular cities may be explained in terms of local economy and culture. E.g. traditional Silesian culture that posits men as breadwinners working in coal mines, and women as homemakers, explained relatively masculinised onomastic landscape of Katowice, while Częstochowa, the site of the most famous Catholic shrine in Poland, boasts the highest number of street names devoted to the female saints, etc. In her paper, Walkowiak quotes an investigation by Jędrzejczak (2014), which represents an attempt to make quantitative and qualitative analysis of the toponymic changes in Warsaw since the end of Communism in Poland. Among the other findings, it was revealed that only 14 percent of individual commemorations involved women, even including literary and fairytale characters, while the highest chance for a woman to give her name to a street is to have been active in the army or church structures, which are traditionally very masculine.

The second group of relevant contributions deal with (post)colonial discourse of gender equality in cityscape beyond Europe. Berg and Kearns (1996), discussing the re-instatement of Maori names in Aotearoa (New Zealand) argued that place naming represents a way of 'norming' or legitimating hegemonic power relations, including a number of 'commonsense' notions about gender. Mamvura, Muwati, and Mutasa (2018) pointed out that the nationalist liberation movement in Zimbabwe was generally gender inclusive due to the need for forming a united front against colonialism, but inclusive aspect ceased to exist in the post-inde-

pendence period. Forrest (2018) raises questions around commemorating the role of women in the South African liberation struggle. Zuvalinyenga and Bigon (2020) provided a comparative view on the scope of gender-biased street naming in sub-Saharan Africa's cityscapes and identified its decisive factors.

In Ukraine, gender disparities in regional dimension were first revealed in detail by Mezentseva and Kryvets (2013). Addressing numerous aspects of gender inequality in Ukraine, the authors, however, left the symbolic representation of women in cultural landscape beyond the research scope, although their insights about the existing gender stereotypes in the country are valuable in terms of understanding regional patterns of toponymic gender inequality.

DATA AND METHODS

The study of Ukrainian female street names was carried out on the basis of 41 largest cities representing all administrative regions. The study focused on personal names, i.e. those given in honour of specific individuals. If the same person has been commemorated by more than one object in the same city, commemoration has been counted as double or multiple. All analyzed names, regardless of the object type, hereinafter are treated as 'street names' or 'urbanonyms'.

The following indicators were calculated:

1. Quantity of female street names in 2020.
2. Percentage of female street names from the total number of personal commemorative urbanonyms in 2020.
3. Quantity of female street names that emerged in 1991-2020.
4. Percentage of female street names from the total quantity of personal commemorative urbanonyms that emerged in 1991-2020.
5. Percentage of female street that emerged in 1991-2020 from the total quantity of female urbanonyms in 2020.
6. Ratio of the quantity of female street names in 2020 to 1991.
7. Ratio of the share of female street names from the total number of personal commemorative urbanonyms in 2020 to 1991.
8. Percentage of female street names related to the local or regional cultural and historical context in 2020.

The main dataset about female street names in studied cities for the period of 1991-2020 was taken from the following sources: 1) official printed and online directories of urban hodonymy available on the websites of the municipalities; 2) official documents of local governments related to the naming and renaming of streets. All data gathered was systematized to create a single database allowing tracing all naming and renaming related to the female street names in the specified period. Indicators 1 and 2 were calculated for 41 studied cities, including 5 cities

currently not controlled by the Ukrainian Government. Indicators 3-8 were calculated for 37 studied cities in government-controlled territory. Indicator 2 was additionally taken from Texty.org.ua (Dukach, 2018) for entire administrative regions (data for Donetsk and Luhansk regions are for government-controlled parts only).

Also, the structure of commemorated female personalities by professions and occupations, with certain geopolitical considerations, was determined for 2020. The following classification, taking into account the experience of previous research and Ukrainian specifics (see Stiperski et al., 2011; Bucher et al., 2013a; Bucher et al., 2013b; Gnatiuk, 2018; Gnatiuk and Glybovets, 2020), was applied:

I. Culture:
   1.1. Literature: writers, poets, journalists.
   1.2. Actors and singers.
   1.3. Music: composers, musicians.
   1.4. Cookery experts.
II. Science and education.
III. Sportswomen.
IV. State and military persons.
V. Figures from the realm of culture involved into public, political or military activity as well.
VI. Soviet propaganda:
   6.1. Revolutionaries, labour movement figures.
   6.2. Communist resistance fighters.
   6.3. Heroic air pilots, cosmonauts.
   6.4. Shock workers (highly productive, enthusiastic workers in the Soviet Union and other communist countries, used by the Communist Propaganda to promote socialist competition; in the Soviet Union, Shock Worker of Communist Labour was a honorary title).
VII. Benefactors.
VIII. Religious figures.
IX. Stewardesses.
X. Landowners.

In order to shed more light on the specifics of female commemoration policy in different regions of the country, we analyzed individual cases with an emphasis on the chronology of the emergence and disappearance of female urbanonyms, as well as relevant cultural and political contexts (excluding short period of the Nazi occupation):

1. Lviv is the largest city in Western Ukraine and the eighth most populous city in the country. The city is a core of the historical region of Galicia (Halychyna), with a long history of cultural and political influence of Poland and Austria-Hungary,

as well as one of the key centres of military and political struggle for Ukrainian independence during the XX century.

2. Kyiv is the capital and largest city of the country, located in the north of its central part. The city was the ancient heart of Kievan Rus, an important urban centre of Russian Empire and Soviet Union, and nowadays converted into the arena of the modern geopolitical struggle for the Ukraine's geopolitical future. Both two recent Ukrainian revolutions, Orange Revolution and Revolution of Dignity (Euromaidan) started and had the most important events in Kyiv.
3. Kharkiv is the largest city in Eastern Ukraine and the second most populous city in the country. It was the first capital of Soviet Ukraine (till 1934) and survived relatively early industrialization in the first third of the 20th century, as well as several waves of Russification. Significant share of the local electorate has traditionally supported pro-Russian political forces.

The archival data about female street names for these three case studies were taken from the relevant directories and databases, e.g. 'Kyiv Streets. Official Directory' (Kyiv City State Administration, 2015), 'Directory of Kyiv Streets' (Kudrytskyi, 1995), electronic directory 'Lviv Streets' (Centre for Urban History of Central and Eastern Europe, 2020), as well as from the maps and plans of cities for different years.

RESULTS AND DISCUSSION

1. National dimension and regional trends of female street names in 2020

The share of female street names from all personal commemorative names in analyzed Ukrainian cities fluctuates in range from 0% (in Severodonetsk) to 9.2% (in Sumy) with an average value of 6.0%. In this regard, situation in Ukraine is quite similar to the other countries, both from the southern (c.f. Bosworth, 2012; Novas-Ferradás, 2018) and central (c.f. Perić and Kuzmanić, 2018; Walkowiak, 2020) parts of Europe.

Female street names are more common for the western and central parts of Ukraine comparing with the southeast. This is especially noticeable in terms of entire administrative regions. In the west and in the centre, the share of female street names is higher than 5%, with maximum values observed in Western Ukraine (historical regions of Galicia, Volhynia, and Bukovina), as well as on the Left Bank of the Dnieper (Poltava and Sumy regions). At the same time, the share of female street names in the southeast is mostly less than 5%. In terms of individual cities, the situation is more diverse: there are cities in the west with a low share of female urbanonyms (e.g. Ternopil or Kamianets-Podilsky) and cities in the southeast with a high share (e.g. Pavlograd or Ievpatoria). However, six of the eight cities with a very high proportion of female urbanonyms (over 8%) are located in the west and in the centre while only two in the southeast (figure 1).

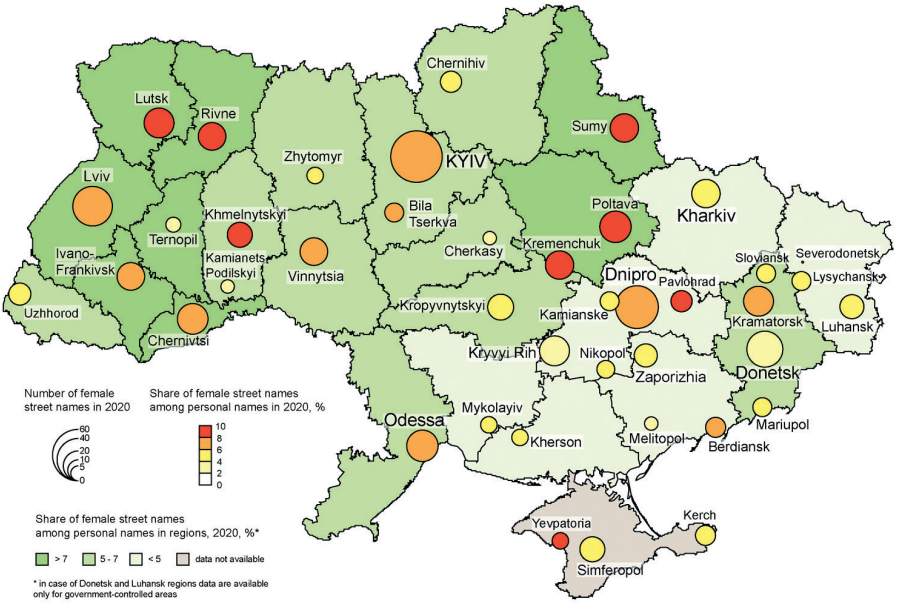


Figure 1
Quantity and share of female urbanonyms in 2020
Source: *elaborated by the authors; data for regions (choropleth map) taken from Texty.org.ua (Dukach, 2018)*

The largest quantity of female urbanonyms is predictably concentrated in the largest cities with population of over 1 million. However, regional differences mean that a city in the west or centre of the country, on average, has more female street names than a comparable city in the southeast. If large cities with a population of 200,000-300,000 in the centre and west of the country have an average of 20-30 female urbanonyms, the similar cities in the southeast typically have only 5-10 (figure 1).

2. Female urbanonyms of the Independence period

The share of female street names from all personal commemorative names in the period after the USSR collapse fluctuates in range from 0% in Severodonetsk to 16.7% in Kremenchuk with an average value of 6.4%. Although the average values are similar, the standard deviation in the Independence period ($\sigma = 0.43$) is two times higher than for the total integrity of female names in 2020 ($\sigma = 0.21$). This indicates the divergence of trends in individual cities: while some of them experienced tangible growth of female toponymy, the others had the opposite situation. Even geographically close cities may have striking differences in the quantity of

female street names that have emerged since 1991 (figure 2). However, the trend towards a more active appearance of female urbanonyms in the west and centre of the country is noticeable in this case as well. Among the 10 cities where seven or more female urbanonyms appeared during 1991-2020, only one (Dnipro) is located in the southeast. Among the 12 cities, where the share of female urbanonyms exceeds 10%, only two are located in the southeast. In four cities of the southeast (Mykolaiv, Mariupol, Severodonetsk, Lysychansk) new female urbanonyms did not appear at all.

These regional disparities in the recent activity of female urbanonymy are closely related to regional decommunization strategies, as most female urbanonyms of the independence period arose precisely due to decommunization process. While in the west and in the centre of the country the policy of direct commemoration prevailed, which led to the appearance of a large number of personal names (including female once), in the southeast preference was given to politically neutral names, including topographic or figurative (Gnatiuk, 2018), resulting in less share of commemorative urbanonyms, including female. Also, southeast of Ukraine is pronouncedly industrial region, where the role of woman in society is perceived as much more limited to the private sphere of life (Mezentseva and Kryvets, 2013).

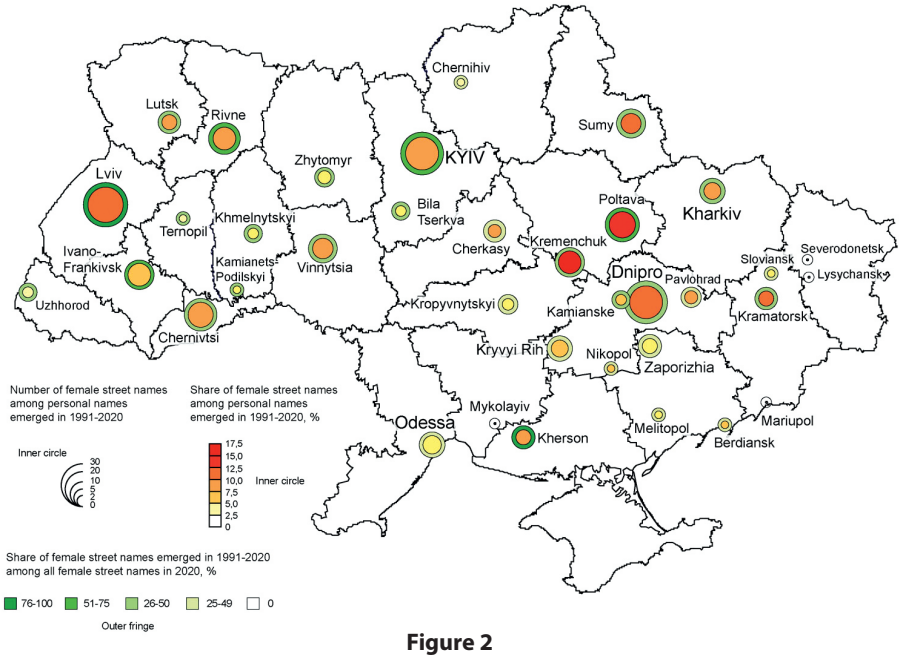


Figure 2
Quantity and share of female urbanonyms introdiced in 1991-2020
Source: *elaborated by the authors*

The intensive introduction of new female urbanonyms during the period of independence led to the fact that the names of the independence era now make up the majority of all female urbanonyms in such cities as Kyiv, Poltava, Kremenchuk (centre), Lviv, Ivano-Frankivsk (west), Kherson (south). Thus, female pantheon of these cities was significantly renewed after the USSR collapse. At the same time, in almost half of the cities analyzed, especially in the southeast, the share of new female urbanonyms is less than 25%, which means that most of current female street names in these cities are inherited from previous historical periods, primarily the Soviet era.

3. Comparison of 2020 to 1991

The quantity of female urbanonyms in 1991-2020 increased in 16 cities (44%), did not change in 6 cities (17%), and decreased in 14 cities (39%). The percentage of female urbanonyms in 1991-2020 increased in 21 cities (58%) and decreased in 15 cities (42%; fugure 3). Thus, while one half of the studied cities show positive dynamics of the number and share of female urbanonyms, and hence came closer to the gender equality, the other half experienced opposite trend of the increased gender disparities. Poltava (absolute increase of 100%, relative increase of 68%)

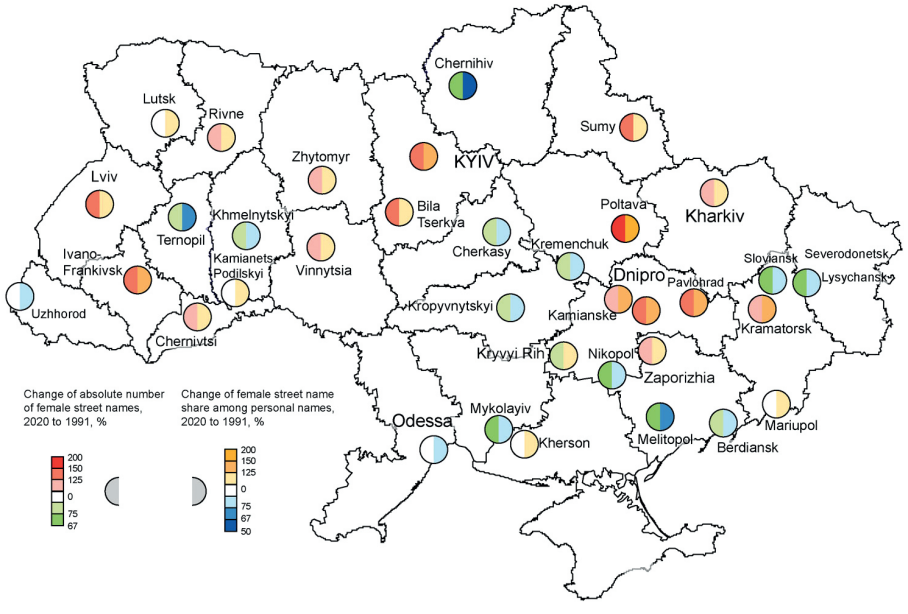


Figure 3
Change of quantity and share of female urbanonyms in between 1991-2020
Source: *elaborated by the authors*

and Chernihiv (absolute decrease of 63%, relative decrease of 57%) are located at opposite ends of the spectrum.

Geographically close cities may have opposite dynamics. However, cities with positive dynamics are more concentrated in the west and centre (where the streets named after Communist figures were recently renamed, including with introducing new female names), while cities with negative dynamics concentrate in the southeast (where numerous Communist female urbanonyms had to disappear and new ones appeared much less frequently). However, there are clear exceptions to this rule. For example, a group of cities in the Dnipro region (eastern part of the country) are characterized by a strong positive dynamics. On the other hand, two of the three cities with the worst dynamics are located in the northern (Chernihiv) and western (Ternopil) parts of Ukraine. Thus, the resulting trend for each city is shaped by the overlap of regional and individual characteristics.

4. In whose honour? Commemorated women by profession

The most common category of female urbanonyms are those perpetuating prominent cultural figures (figure 4). They are present in all studied cities, except for Kerch (Crimea) and Severodonetsk (Donbas). The share of these urbanonyms has a clear downward trend from the west (almost everywhere more than 50%) to the south and east (25-30% in the largest cities and 10-20% in smaller cities on average). Famous writers and poets, actors and singers predominate among the commemorated cultural figures; street names honouring representatives of the visual arts, music and cuisine are rare and concentrate mostly in the largest cities.

The second most common category of female urbanonyms consists of names honouring the heroic figures of Soviet propaganda. These urbanonyms make up the vast majority of all female street names in the east and south of the country. Especially striking predominance of such street names is seen in the cities not controlled by the Ukrainian government since 2014, i.e. those that have not undergone decommunization. The share of the Soviet propagandist female street names is also quite high in the rest of Donbas, as well as in some cities in Dnipro and Zaporizhia regions, and in Chernihiv (far north). At the same time, in the western part, such urbanonyms are few, in particular, they are completely absent in the cities of Galicia (Lviv, Ternopil, Ivano-Frankivsk), as well as in some cities of Volhynia (Rivne) and Podolia (Kamianets-Podilskyi).

The third place is occupied by public, political and military figures. There are two regularities in the regional distribution of these urbanonyms: they are concentrated in the cities of the Western Ukraine, as well as in the largest cities in all parts of the country. Moreover, a specific set of typical commemorated personalities differs in the different regions: if in the western part they are mostly figures of

national liberation movements and Soviet dissidents, in the east and south they are predominantly Russian empresses and Soviet party and state figures.

The fourth largest category includes famous women in the field of science and education. These urbanonyms are relatively evenly distributed throughout the country, concentrating in the largest cities, especially in university centres and cities with strong scientific traditions.

Other categories of female street names (Christian saints, patrons and benefactors, athletes, landowners and stewardesses) are numerically insignificant and do not have clear regional distribution trends.

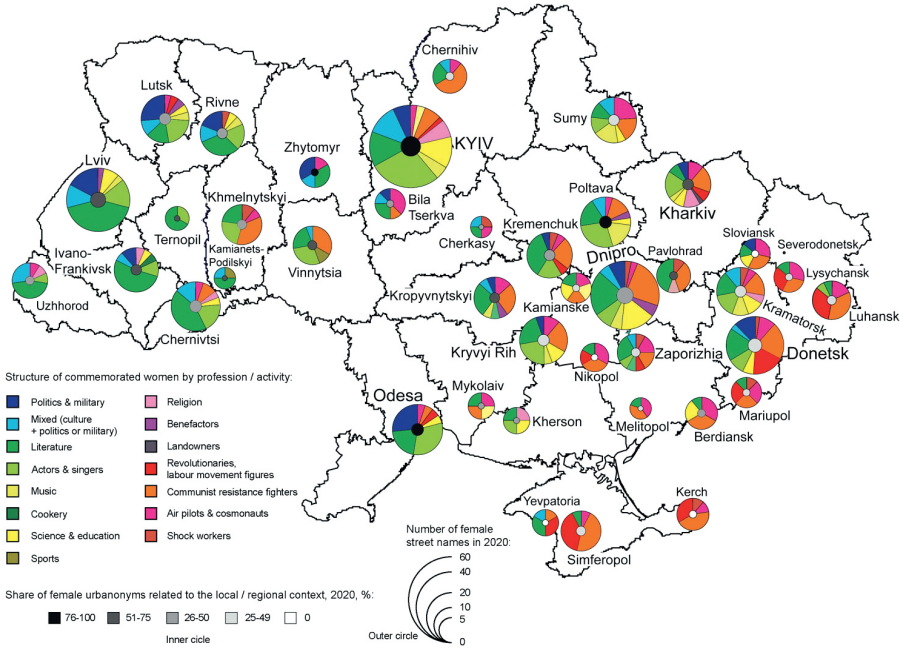


Figure 4
Structure of commemorated women in terms of profession / activity and relation to local / regional context
Source: *elaborated by the authors*

The aggregate list of the most common women in Ukrainian toponymy, based on the data from 41 studied cities (Table 1), includes approximately equal number of figures representing arts and culture and figures of Soviet propaganda (heroic pilots and partisans), slightly sprinkled with political figures and scientists. Ukrainians somewhat outnumber Russians; however, 5 of 16 women have nothing common with Ukraine.

Table 1 The most common women in Ukrainian hodonymy, 2020

Name, years of life	Number of toponyms	Profession / activity
Lesya Ukrainka (1871-1913)	42	Ukrainian writer and poetess
Polina Osipenko (1905-1939)	24	Heroic Soviet pilot of Ukrainian origin
Zoya Kosmodemianskaya (1923-1941)	23	Russian Soviet resistance fighter
Liza Chaykina (1918-1941)	22	Russian Soviet resistance fighter
Marko Vovchok (1833-1907)	20	Ukrainian writer
Olha Kobylianska (1863-1942)	16	Ukrainian writer
Sofia Kovalevskaya (1850-1891)	13	Russian mathematician
Solomia Krushelnytska (1872-1952)	13	Ukrainian opera singer
Olena Teliha (1906-1942)	13	Ukrainian poetess and political activist
Maria Zankovetska (1854-1934)	12	Ukrainian actor
Olena Pchilka (1849-1930)	12	Ukrainian writer and poetess
Uliana Gromova (1924-1943)	12	Ukrainian Soviet resistance fighter
Sofia Perovskaya (1852-1881)	12	Russian revolutionary
Marina Raskova (1912-1943)	11	Heroic Soviet pilot of Russian origin
Valentina Gryzodubova (1909-1993)	10	Heroic Soviet pilot of Russian origin
Princess Olga of Kyiv (910-969)	10	Regent of Kievan Rus, Orthodox saint

Source: calculation by the authors

5. Local and regional context of commemoration

The proportion of female urbanonyms related to the local or regional context is higher in western and central parts (on average 30-40%) and smaller in the south-east (on average 15-20%). Among nine cities with a share of 50% and more, only two (Odessa and Kharkiv) are located in the southeast (figure 4). There are two reasons for low shares of locally-rooted female street names in the southeast. First, these regions still have a large proportion of names honouring heroic figures of Soviet propaganda, which were widely commemorated in all Soviet cities regardless of the local context. Secondly, due to preferences for ideologically neutral names, first of all – non-personal, new female urbanonyms appeared there in limited numbers, commemorating primarily well-known national figures, while local female figures had little opportunity to be inscribed on the city map. As a result, female street names in the western and central parts of the country have become more tied to the local historical and cultural context, while in the south-eastern part the situation has changed little compared to Soviet times.

6. Comparative analysis of cases

This section focuses on three cases (cities of Lviv, Kyiv and Kharkiv), presenting comparative analysis of female commemorative toponymy in historical prospective. The following historical periods were found to be applicable for all three cities under review: 1) Imperial period (before the World War I, when Ukrainian territory was divided between two empires – Russia and Austro-Hungary), 2) Inter-war period (between the end of the First World War and the beginning of the Second World War); 3) Post-war period (between the Second World War and Soviet Union collapse); 4) Independence period (after the proclamation of Ukrainian Independence in 1991).

In Lviv, the first recorded female street names appeared even before the XIX century, that means significantly earlier and in significantly greater numbers than in Kyiv and Kharkiv, as will be shown below. Most of such names refer to Christian saints, as well as representatives of Polish and Hungarian royal families. However, at the beginning of the XX century they were joined by representatives of the cultural sphere, including Polish female writers, painters, political figures and member of feminist movement. All of non-fictitious listed personalities were directly related to the Polish context in the absence of Polish statehood at the time. This is a consequence of the strong positions of the Polish national elites in the Austro-Hungarian Empire and the absence of a harsh dictate in the field of commemoration by the central government in Vienna.

The inter-war period for Lviv coincides with the Second Polish Republic (1918-1939). That time was marked by further penetration of Polish national historical and cultural narrative in the urban symbolic space with numerous commemorations of Polish female writers, actors, scientists, doctors, as well as a military leader (Emilia Plater). Interestingly, these personages are still well represented among the urban street names of contemporary Poland (Walkowiak, 2020).

The post-war period was marked by the Soviet role with a short break of the Nazi occupation. The mass appearance of Soviet street names in Lviv began immediately after World War II. The evident goal of toponymic policy was the integration of Lviv, as well as other cities of Western Ukraine, into the Soviet ideological and cultural space. Ideologically hostile names in honour of Christian saints and Polish royal family members were eliminated and replaced by urbanonyms typical for the whole USSR, commemorating Soviet stateswomen and party figures, activists of the international labour movement, partisans, pilots and cosmonauts. Also, some streets were named in honour of Russian female figures from culture and science. The process of Sovietization envisages also de-Polonization and Ukrainization of the symbolic space. Most street names given in honour of prominent Poles were eliminated, and Ukrainian writers, actors, opera singers, representatives of fine arts were commemorated instead.

The Independence period started with decommunization and de-Russification of the symbolic space that took place in Lviv at the initiative of local government. Merely all street names honouring Communists, including Soviet state and party figures, were erased and prominent figures (including female) representing Ukrainian history and culture were commemorated instead. The first group of such persons includes political and military figures of the national liberation movement of the XX century, including Ukrainian People's Republic, Western Ukrainian People's Republic, Organization of Ukrainian Nationalists, and Ukrainian Insurgent Army. The second group includes representatives of different realms of Ukrainian national culture (writers, poets, opera singers, teachers), many of whom were repressed by the Soviet authorities or obliged to emigrate. Outstanding natives of Ukraine who distinguished themselves in politics and public administration and became part of the new Ukrainian national myth were not forgotten either: Kievan Rus Princess Olga and Roksolana (Hurrem Sultan). Some female urbanonyms of the Polish period have been restored.

In Kyiv, the first female street names appeared in the middle of the XIX century in honour of Christian saints (deriving from the names of local monasteries and churches), as well as empresses and princesses of Russia and the Kievan Rus. In the inter-war period, with the establishment of Soviet role, new female street names became more frequent, but the criteria for commemoration have changed: the streets were named almost exclusively after revolutionaries, Communist Party figures and outstanding Soviet pilots. Lesya Ukrainka, the most famous Ukrainian writer and poetess, was the only one Ukrainian cultural figure among commemorated women. The names of Russian empresses were replaced with the names of female Communist leaders.

The rapid spatial development of the city in the post-war period forced to urgently invent hundreds of new original street names, including female urbanonyms. The continuously popular names of revolutionaries and Communist leaders were complemented with the names of international labour movement activists and personages of resistance partisan movement, Soviet singers and actors, several writers of the pre-Soviet period sanctioned by the Soviet authorities, scientists, and cosmonauts. The Soviet perestroika was marked by liberalization of naming policy, and several streets named after poetesses disgraced in the Soviet era appeared already in the late 1980s.

The Independence period was marked by commemoration of Ukrainian cultural figures that in the Soviet era were recognized as non-prioritized or ideologically harmful (as they did not follow the generally accepted canon of socialist realism or took part in anti-Soviet social and political activities). The tradition of commemorating actors and singers has been continued as well. Since 2015, new female urbanonyms of Kyiv have emerged in the process of decommunization. In this sub-period,

the status of a victim of the Soviet regime or anti-Soviet activity was among key criteria for the name selection. Consequently, several streets of Ukrainian capital were renamed after female dissidents and human rights activist, politicians, as well as scientists, painters and singers that suffered from the Communist rule.

The development of female street names in Kharkiv during the four specified periods generally corresponds to the process observed in Kyiv. The imperial period was abounded with female street names in honour of Christian saints, rulers of the Russian Empire and Kievan Rus, and local landowners. During the inter-war period female street names began to commemorate revolutionaries, Communist Party activists, and representatives of the labour movement, but some XIX century Ukrainian writers also received their streets. The main accents during the post-war period were done on perpetuating the memory of partisan resistance movement; however, there were also typical Soviet female urbanonyms honouring prominent pilots, singers, actors and Communist party functionaries.

Certain differences from situation in Kyiv started only in the Independence period. The actual appearance of the newest female street names in Kharkiv started only in 2015, after the beginning of the official decommunization process. Women of different professions were commemorated, including painters, actors and singers, ballet dancers, physicians, scientist, fashion designers. At the same time, names of Communist figures were erased. However, the approach to decommunization in Kharkiv was milder than in Kyiv and certainly in Lviv. For example, in Kharkiv a street named after the Russian revolutionary Sofia Perovskaya was pre-

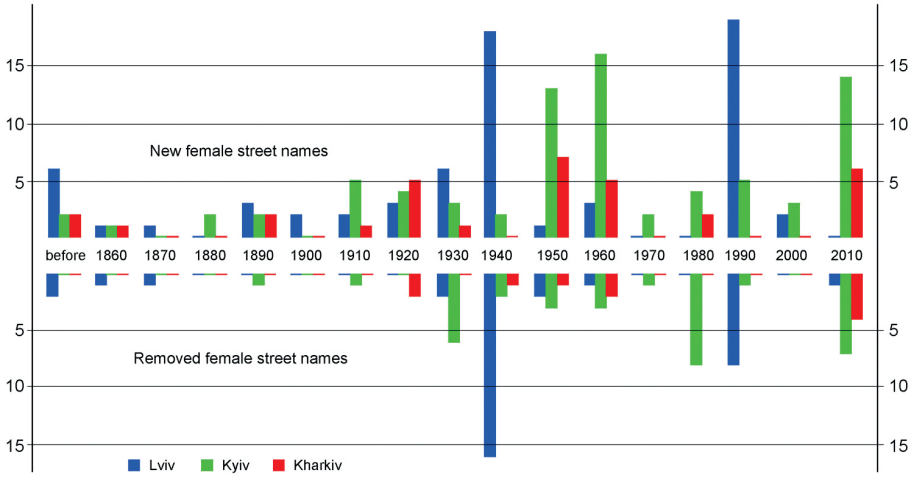


Figure 5
Historical dynamics of female urbanonyms in Lviv, Kyiv and Kharkiv
Source: *elaborated by the authors*

served, while in Kyiv it was renamed. Furthermore, the politics of othering Soviet and Russian did not play a significant role in the choice of new female names in Kharkiv, in contrast to Kyiv and Lviv. E.g., in 2016, a street in Kharkiv has been given back its historical name in honour of the Russian Empress Catherine II – unthinkable situation neither in Kyiv nor in Lviv, but quite typical for southern and eastern parts of Ukraine.

For temporal dynamics of female urbanonyms in three case cities see figure 5.

CONCLUSIONS

Contemporary toponymic gender disparities in the cities in Ukraine are similar to those observed in other European countries. However, the specificity of Ukraine as a post-Soviet country is expressed in a different structure of female urbanonyms. Due to the Soviet policy of secularization and erasing the memory of the 'bourgeois past', the proportion of female Christian saints, landowners, and female relatives of the famous masculine personalities in Ukraine is significantly smaller. That is why really prominent women from the different domains of activity had stronger chance to be commemorated. However, in practice, it became possible only after the USSR collapse, as the memory policy in the Soviet Union was biased towards commemoration of a narrow list of ideologically useful personalities and silencing unwanted figures.

Decommunization, carried out in the modern democratic period, has had ambiguous effect on the gender proportions of urban toponymy. On the one hand, the renaming made it possible to introduce a lot of new female names, substantially diversifying the national female pantheon, opening up new dimensions of women's participation in the national and universal history, and binding the female street names to the local historical and cultural context. On the other hand, communist-coloured female names have disappeared from maps of Ukrainian cities, which together with a trend to maximally avoid new commemorative street names in certain regions and individual cities has even worsened gender imbalance comparing to the Soviet period.

Although the majority of commemorated women had peaceful professions (first of all related to the different realms of culture), activity in the fields of politics or military actions significantly increases the chance for a woman to be commemorated. That was typical all basic ideological time periods: pre-Soviet, Soviet and post-Soviet. Thus, ideological preferences for commemoration are changing but not the principle itself. This seems also to confirm the observation that a woman had better die in military service on the front if she wishes to merit a street named after her (Caffarelli, 2012).

Existing regional differences of toponymic gender imbalance are explained by both (geo)political differences, defining preferences for certain category of

toponymy, and economic and cultural factors like proportions of urban and rural population, economic structure, confession structure, etc. However, Ukrainian cities with high levels of toponymic gender disproportions still have great opportunities to change the situation as proven by other cities that have come a long way to the gender parity.

REFERENCES

ALDERMAN, D., INWOOD, J. (2017). Street naming and the politics of belonging: spatial injustices in the toponymic commemoration of Martin Luther King, Jr. In Rose-Redwood, R., Alderman, D., Azaryahu, M., eds., *The Political Life of Urban Streetscapes: Naming, Politics, and Place*. Abingdon, U.K.: Routledge, pp. 259-273.

BARRINGTON, L. W., HERRON, E. S. (2004). One Ukraine or many? Regionalism in Ukraine and its political consequences. *Nationalities Papers*, 32, 53-87, https://doi.org/10.1080/0090599042000186179.

BBC (2019). Bradford to name streets after women to tackle gender imbalance. Retrieved from: https://www.bbc.com/news/uk-england-48587377. Accessed on 15 June 2020.

BERG, L., KEARNS, R. (1996). Naming as norming: 'race', gender, and the identity politics of naming places in Aotearoa/New Zealand. *Environment and Planning D: Society and Space*, 14, 1, 99-122, https://doi.org/10.1068/d140099.

BONDAREV, I. (2011). Streets of the fair sex. Retrieved from: http://report.if.ua/uncategorized/Vulyci-prekrasnoyi-stati/. Accessed on 15 June 2020. (in Ukrainian: Бондарев І., 2011. Вулиці прекрасної статі).

BOSWORTH, M. (2012). Are our street names sexist? Retrieved from: https://www.bbc.com/news/magazine-17203823. Accessed on 15 June 2020.

BUCHER, S., MATLOVIČOVÁ, K., MATLOVIC, R., LUKACOVA, A. HARIZAL, B., KOLESÁROVÁ, J., CERMAKOVA, L., MICHALKO, M. (2013a). The possibilities for analysing street names in relation to the space and identity: case study of Slovak cities. *Advances in Education Research*, 47, 2160-1070.

BUCHER, S., MATLOVIČOVÁ, K., MATLOVIC, R., LUKACOVA, A. HARIZAL, B., KOLESÁROVÁ, J., CERMAKOVA, L., MICHALKO, M. (2013b). The perception of identity through urban toponyms in the regional cities of Slovakia. *Anthropological Review*, 19, 3, 23-40.

CAFFARELLI, E. (2012). Odonimi: dalla funzione descrittiva a quella pedagogico-celebrativa e simbolica. Con tre proposte per le dedicazioni al femminile. In Ercolini, M. P., ed., *Sulle vie della parità: Atti del I Convegno di Toponomastica femminile*, Roma 6–7 ottobre 2012. Roma: UniversItalia, pp. 27-34.

CENTRE FOR URBAN HISTORY OF CENTRAL AND EASTERN EUROPE (2020). Lviv Streets. Retrieved from: https://streets.lvivcenter.org/. Accessed on 15 June 2020.

DE SOTO, H. G. (1996). (Re)inventing Berlin: dialectics of power, symbols and pasts, 1990–1995. *City & Society*, 8, 1, 29-49, , https://doi.org/10.1525/ciso.1996.8.1.29.

DUKACH, Y. (2018). In whose honours are the streets of Ukraine named? Retrieved from: https://texty.org.ua/d/2018/streets/. Accessed on 15 June 2020. (in Ukrainian: Дукач Ю., 2018. На чию честь названі вулиці України).

EUROPEAN ECONOMIC AND SOCIAL COMMITTEE (2019). Italian organisation "Women's Toponymy" is the winner of the 2019 EESC Civil Society Prize on gender equality. Retrieved from: https://www.eesc.europa.eu/en/news-media/press-releases/italian-organisation-womens-toponymy-winner-2019-eesc-civil-society-prize-gender-equality. Accessed on 15 June 2020.

FORREST, C. (2018). What's in a name? A feminist reflection on street name changes in Durban. *Agenda: Empowering Women for Gender Equality*, 32, 2, 53-61, https://doi.org/10.1080/10130950.2018.1445338

GNATIUK, O. (2018). The renaming of streets in post-revolutionary Ukraine: Regional strategies to construct a new national identity. *Acta Universitatis Carolinae Geographica*, *53,* 2, 119-136, https://doi.org/10.14712/23361980.2018.13.

GNATIUK, O., GLYBOVETS, V. (2020): Do street status and centrality matter for post-socialist memory policy? The experience of Ukrainian cities. *Geographia Polonica*, 93, 2, 139-161, https://doi.org/GPol.0167.

JAFFE, E. (2015). The streets of Paris, renamed for women. Bloomberg City Lab. Retrieved from: https://www.bloomberg.com/news/articles/2015-08-27/a-french-feminist-group-renamed-paris-streets-for-women. Accessed on 15 June 2020.

JĘDRZEJCZAK, A. (2014). Ksiądz z generałem w porannej rosie – o nazewnictwie warszawskich ulic. Retrieved from: http://www. panskaskorka.com/o-nazewnictwie-warszawskich-ulic-2/. Accessed on 15 June 2020.

KHALYMONYK, H. (2018). Biliaivka style of gender inequality: How many gender streets do you think are named after women? Retrieved from: https://bilyayivka.city/read/misto/18407/genderna-nerivnist-po-bilyaivski-yak-dumaete-skilki-vulic-mista-nazvani-na-chest-zhinok-. Accessed on 15 June 2020. (in Ukrainian: Халимоник Н., 2018. Гендерна нерівність по-біляївськи: як думаєте, скільки вулиць міста названі на честь жінок?).

KUDRYTSKYI, A. (ed.) (1995). Directory of Kyiv Streets. Kyiv: Ukrainian Encyclopedia. (in Ukrainian: Кудрицький А. (ред.). 2018. Вулиці Києва. Довідник. Київ: «Українська енциклопедія» ім. М. П. Бажана).

KYIV CITY STATE ADMINISTRATION (2015). Kyiv Streets. Official Directory. Retrieved from: https://kyivcity.gov.ua/img/item/general/167.pdf. Accessed on 15 June 2020. (in Ukrainian: Вулиці міста Києва. Офіційний довідник).

MAMVURA, Z., MUWATI, I., MUTASA, D. (2018). Toponymic commemoration is not for one sex': The gender politics of place renaming in Harare. *African Identities*, 16, 4, 1-15, https://doi.org/10.1080/14725843.2018.1474086.

MATLOVIČ, R., MATLOVIČOVÁ, K. (2020). First and second order discontinuities in world geographical thought and their primary reception in Slovak geography. *Folia Geographica*, 62, 1, 52-76.

MEDITERRANEAN INSTITUTE OF GENDER STUDIES (2009). Glossary of gender-related terms (eds. J. Christodoulou, A. Zobnina). Retrieved from: http://www.peacewomen.org/assets/file/AdvocacyEducationTools/genderglossary_migs_aug2005.pdf. Accessed on 15 June 2020.

MEZENTSEVA, N., KRYVETS, O. (2013). *Gender and geography in Ukraine*. Kyiv: Nika-Tsentr. (in Ukrainian: Мезенцева Н., Кривець О., 2018. Гендер і географія в Україні. Київ: Ніка-Центр).

NADA, S. (2014). Gender aspects of public urban space: analysis of the names of Belgrade streets. *Sociologija*, 56, 2, 125-144, https://doi.org/10.2298/SOC1402125S.

NEAGA, D. (2014). Doing and undoing gender in urban spaces: The University Square Bucharest. *Analize: Journal of Gender and Feminist Studies*, 3, 17, 28-49.

NICULESCU-MIZIL, A. (2014). (Re)naming streets in contemporary Bucharest: From power distribution to subjective biography. *Analize: Journal of Gender and Feminist Studies*, 3, 17, 69-94.

NOVAS-FERRADÁS, M. (2018). Commemorative urban practices and gender equality: The case of Santiago de Compostela's urban anthroponymy. *Hábitat y Sociedad*, 11, 1, 109-129, http://dx.doi.org/10.12795/HabitatySociedad.2018.i11.07.

O'CONNOR, R. (2015). Feminists in France change Paris street names to celebrate inspirational women. Retrieved from: http://www.independent.co.uk/news/world/europe/feminists-in-france-change-paris-street-names-to-celebrate-inspirational-women-10474690.html. Accessed on 15 June 2020.

ONYSKIV, M. (2018). Only 6% of street names in Kalush are dedicated to women. Retrieved from: https://kalushnews.city/read/events/4536/tilki-6-nazv-vulic-kalusha-prisvyacheni-zhinkam-infografika. Accessed on 15 June 2020. (in Ukrainian: Ониськів М., 2018. Тільки 6% назв вулиць Калуша присвячені жінкам).

PERIĆ, I., KUZMANIĆ, A. (2018). Croatia, where the streets have no (women's) names. Retrieved from: https://www.europeandatajournalism.eu/eng/News/Data-news/Croatia-where-the-streets-have-no-women-s-names. Accessed on 15 June 2020.

POON, L. (2015). Mapping the Sexism of City Street Names. Bloomberg City Lab. Retrieved from: https://www.citylab.com/equity/2015/11/mapping-the-sexism-of-city-street-names/414094/. Accessed on 15 June 2020.

PORTNOV, A. (2013). Memory wars in post-Soviet Ukraine (1991–2010). In Blacker, U., Etkind, A., Fedor, J., eds., *Memory and Theory in Eastern Europe*. New York: Palgrave Macmillan, pp. 233-254.

REXHEPI, E. H. (2017). Ukraine's geopolitical position: between East and West. *SEEU Review*, 12, 1, 95-111, https://doi.org/10.1515/seeur-2017-0007.

ROSE-REDWOOD, R., ALDERMAN, D., AZARYAHU, M. (2017). The urban streetscape as political cosmos. In Rose-Redwood, R., Alderman, D., Azaryahu, M., eds., *The Political Life of Urban Streetscapes: Naming, Politics, and Place*. Abingdon, U.K.: Routledge, pp. 1-24.

SEMENIUK, D. (2017). More streets in Kropyvnytskyi are named after trees and flowers than in honour of women. Retrieved from: https://www.ugorod.kr.ua/news/2017-11-05-61064.html. Accessed on 15 June 2020. (in Ukrainian: Семенюк Д., 2017. На честь дерев та квітів у Кропивницькому названо більше вулиць, ніж на честь жінок).

SHEVEL, O. (2011). The politics of memory in a divided society: a comparison of post-Franco Spain and post-Soviet Ukraine. *Slavic Review*, 70, 1, 137-164.

SHRUB, K. (2018). Secrets of Dnipro: women on the city map. Retrieved from: https://gorod.dp.ua/news/142734. Accessed on 15 June 2020. (in Russian: Шруб К., 2018. Тайны Днепра: женщины на карте города).

STEBLYNA, I. O. (2013). Female names on the map of Kryvyi Rih. *Saksahan*, 4, 30-32. (in Ukrainian: Стеблина, І. О., 2013. Жіночі імена на карті Кривого Рогу. Саксагань, 4, 30-32).

STIPERSKI, Z., LORBER, L., HERŠAK, E., PTAČEK, P., GÓRKA, Z., KOŁOŚ, A., LONČAR, J., FARIČIĆ, J, MILIČEVIĆ, M., VUJAKOVIĆ, A., HRUŠKA, A. (2011). Identity through urban nomenclature: Eight Central European cities. *Geografisk Tidsskrift – Danish Journal of Geography*, 111, 2, 181-194, https://doi.org/10.1080/00167223.2011.10669532.

THE LOCAL (2017). Geneva agrees to name more streets after women. Retrieved from: https://www.thelocal.ch/20170309/geneva-agrees-to-name-more-streets-after-women. Accessed on 15 June 2020.

TOJO, M. (2015). Santas y vírgenes representan a las mujeres en el callejero español. Retrieved from: http://www.eldiario.es/sociedad/Santas-virgenes-representan-callejero-espanol_0_353814783.html. Accessed on 15 June 2020.

VYSOKOLIAN, O. (2016). Six famous Lviv women in the names of Lviv streets. Retrieved from: https://photo-lviv.in.ua/imena-6-vidomyh-lvivyanok-u-nazvah-vulyts-lvova/. Accessed on 15 June 2020. (in Ukrainian: Високолян О., 2016. Імена 6 відомих львів'янок у назвах вулиць Львова).

WALKOWIAK, J. B. (2020). Female street namesakes in selected Polish cities. *Mitteilungen der Österreichischen Geographischen Gesellschaft*, 160, 331-350, https://doi.org/10.1553/moegg160s331.

ZUVALINYENGA, D., BIGON, L. (2020). Gender-biased street naming in urban Sub-Saharan Africa: influential factors, features and future recommendations. *Journal of Asian and African Studies*, June 2020, https://doi.org/10.1177/0021909620934825.

FOLIA GEOGRAPHICA • ISSN 1336-6157 (hard copy) • ISSN 2454-1001 (online)

DESTINATION IMAGE FOR PILGRIMAGE AND TOURISM: A STUDY IN MOUNT KAILASH REGION OF TIBET

Premangshu CHAKRABARTY [A*], Sanjoy Kumar SADHUKHAN [B]

Received: April 28, 2020 | Revised: September 15, 2020 | Accepted: October 12, 2020
Paper No. 20-62/2-567

Abstract
The study focuses on rituals performed during Kailash - Manasarover pilgrimage while investigating travel motivation aspects and the satisfaction level of visitors. Circumambulation of Mount Kailash and bathing in sacred Manasarover Lake of western Tibet are popular pilgrimage tourism rituals for which journeys are made annually despite of terrain hardship and adverse climatic condition. We have used ethnographic methods in collection of field data that include personal interviews, focus group discussions, questionnaire surveys and online surveys. One of the objectives of the study is to address the research gap on the role of destination image that motivates the devotees of different religious background to undertake such pilgrimage. We also pay attention on attributes that influence the selection of the individual pilgrimage routes initiated from Indian territory. The method adopted for analysis is qualitative involving software support for mapping. The discussion reveals the evolution of a distinctive cultural landscape that encourages pluralism with reference to a sustainable mechanism of coexistence for the pilgrimage tourism development.

Key words
Circumambulation, sacred, ritual, pilgrim tourists, route, landscape, pluralism.

INTRODUCTION

Pilgrimage is a process of establishing a rapport with the sacred geography by sending the message of the landscape that has been imbedded in the myths, legends and tales. In shaping the pilgrimage experience, the myths have important part (Sopher, 1987). Regarding the pilgrimage destination, a sort of *imago mundi* is conceptualized where myth itself has its origin under cosmic horizons (Ilies, et al. 2017). Destination image for pilgrimage and tourism is much more important than the reality of the place itself (Matlovicova and Kolesarova,2011). A pilgrimage site, in theory and practice is a distinctive cultural landscape (Shinde, 2011) that has been created, appropriated, organized and represented by human agency (Campo, 1998). Located in the Kangtose range, the watershed of Tibetan plateau, Mount Kailash (6638m) is one of such auspicious sites of shared faith of the Hindus, Jains, Buddhists and Bons of Asia.

A* Visva Bharati University, Faculty of Geography, Santiniketan, Bolpur, West Bengal, India
drpremangshuindia@gmail.com (corresponding author)
B Visva Bharati University, Faculty of Geography, Santiniketan, Bolpur, West Bengal, India
sks.geo86@gmail.com

It is firmly believed by the Hindus that a journey beneath the mountain peak leads to the sanctum sanctorum, which is structurally a cave, the abode of their God named Lord Shiva, while the Tibetans believes in the presence of a crystal temple of Gonpo Pung (the Black Lord) at the same place. Being irritated with the overflow of pilgrims, the Tibetan deity made His mind to abscond with the whole mountain into the serpent world beneath. It was ultimately prevented due to intervention of Lord Buddha who rushed to the site miraculously and cast snow on the peak in such way that no one can further climb on its holy summit. Tibetan Buddhists believe that the crystal temple is now concealed within the mountain, which they locally call Tise (meaning snow jewel/the great snow mountain).

Circumambulation is made by the pilgrims of different religious background following their prescribed paths. The mandala representation in sacred geometry of Indian origin is adopted in cognizing the Mount Kailash circumambulation route vide implementation of a squaring principal of the circle. Due to varying conception of different religious cultures on sacred geometry of the place, the Buddhists undertake circumambulation in clockwise direction, while the animistic Bons (now recognized as the 5th Tibetan sect by Tibetan government in exile along with the other four Buddhist sects of Tibet) follow the anti-clockwise direction while performing the same ritual in the region.

The claim of Jains and Hindus on Mount Kailash as their legendary Mount Meru is however recent, dating back to the period of contestation between Chinese and British empire on the political control of this region. In Mahabharata, the great Indian epic, Kailash was described as the abode of Kubera, a deity of wealth and treasure, while Kedarnath (in Uttrakhand of India) was recognized as the dwelling place of Lord Shiva. Pilgrimage to Kedarnath has a long history while Hindu pilgrimage to Kailash for Lord Shiva got momentum since 1930s under the British patronage. Swami Pranavanda, an ascetic and founder of *Bharat Shevasram Sangha*, a Hindu religious organization of great repute, organized 23 and 25 circumambulation events in Kailash and Manasarover respectively in the late 1930s and during the 1940s escorting about 5000 pilgrims (Mckay, 1998) Swami Pranavananda being a fellow of Royal Geographical Society of Britain identified the Gaya Chhu as the only outlet of Manasarover (Pranavananda, 1949), which has been cognized as Ganga river by the pious pilgrims relating with popular Hindu myth that Ganga descends on the earth from Lord Shiva.

With such pilgrimage, as cultural claim of India was increasingly established over the region, the Chinese government forbidden all pilgrimage to Kailash from India in the year 1962. After realization of the profits that could be obtained from pilgrimage tourism, Kailash – Manasarover is opened again from August 1981 for Indian pilgrims but in a limited scale with maximum focus on safeguarding the basic geopolitical interest of China who claims Tibet as their territory. Historically Tibet served as the buffer between India and China. Communist China occupied

Tibet with Lhasa (the headquarter) and imposed the claim of Chinese nationality over the Tibetan population, while Tibetan government in exile is operating from Indian town Dharmasala since 1959 as the opposition of Chinese design.

From anthropological perspective, a sacred place may be conceived as an origin point for a prophet; as a place where indigenous gods or spirits reside or as a spot where notable event occurred (Bowen, 2002). Mount Kailash itself is the origin point of the Bon prophet, salvation place of Jain prophet, residence of Hindu God and site for notable events of Tibetan Buddhism. From spiritual point of view, all the geographical features including lakes, river caves and passes of this mountainous region are revered; thereby constitute the geographicity in exploring the pilgrimage place (Spengen, 1998). Linking of sanctity elements to geographical features make them extraordinary from ordinary, being designated as the power places (Eck, 2012). Each and every of such places have undergone the process of transformation from profane to sacred.

The approaches of Turner (1973) contributing to the idea of peripheral centres of pilgrimage is apparently the antithesis of the concentric approach propounded by Eliade (1969). Mount Kailash undoubtedly is a peripheral centre for Indian pilgrim tourists, who during the process of pilgrimage develop a group dynamics referred to as communitas (Turner and Turner, 1969) characterized by a type of unique bonding which is free from social hierarchies. As the pilgrims approach to the sacred centre from the mundane world, they experience a stage of liminality (Cohen, 1992). It is the authenticity issues relating to destination image that make impact on those visitors who are in real sense neither pure pilgrims nor conventional tourists from the standpoint of behavioural characteristics. While the characteristic of place itself inspire devotion, a number of place rituals flourish simultaneously (Mazumder and Mazumder, 2004). For the Indian pilgrim tourists, circumambulation is one of such rituals that symbolize their collective attachment to the place. During circumambulation, movement is mandatorily along a prescribed line that possesses religious meaning (Stoddard, 1987).

Expectations on enjoying mystical or magical religious experiences have their origin in destination image, which constitutes the spatial dimension of pilgrimage. The trek route of pilgrims around Mount Kailash is worthy of attention for its length which is more than 50 km in a region of oxygen deficiency (Snelling, 1983). Circumambulation of Mount Kailash or bathing at Manasarover lake are among the spatial rituals that attract the visitors. All such issues relating to cultural image have been taken into consideration to address the research questions on motivations of pilgrim tourists. There is increasing stress on current geographical research on what the pilgrims say about their pilgrimage and analyze them through the lenses of tourism (Collins-Kreiner, 2010). This paper is an attempt in this context on Indian pilgrims adopting Uttrakhand and Sikkim routes among the five routes (Fig-1) to approach Kailash– Manasarover.

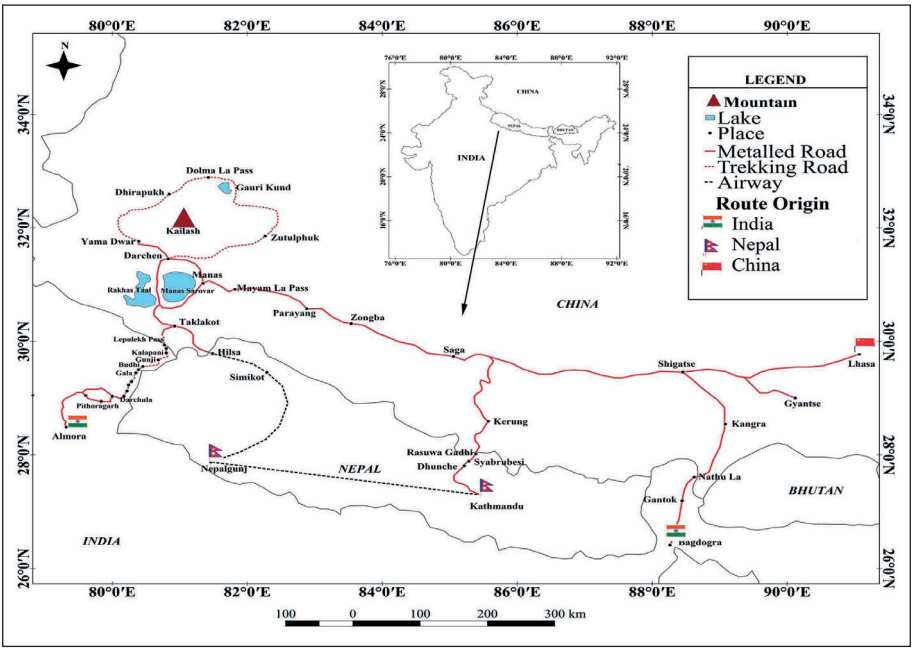


Figure1
Access route to Mount Kailash and Manasarover Lake
Source: *Prepared by the Authors, 2020*

It is noteworthy to mention that reviews of related literatures reveal abundant sociological and anthropological interpretation on Kailash-Manasarover pilgrimage but geographical interpretation of destination image with a focus on pilgrimage routes that could facilitate in various decision making during preparation for a journey are a few. This paper aims to address the research gap on the spatial dimension of pilgrimage tourism with reference to the study area with a focus on its complex socio-spatial process comprised of expectations and experiences. As found worldwide, such processes are historically, culturally and socially dependent (Collins-Kreiner, 2009).

OBJECTIVES

In the dichotomy between pilgrimage and tourism based on the sacrificial parameters, pilgrim tourists stand mid-way possessing half pilgrim and half tourist behavioural character (Rinschede, 1992). A pure pilgrim is ready to sacrifice all the earthly comforts and a tourist on contrary may not have any sacrificing commitment and they respectively constitute the two extreme ends of a continuum (Palmer, et al. 2012). As destination image is one of the determinants of visitors' behaviour, Kailash-Manasarover *Yatra* (pilgrimage journey) of today is nothing but the pilgrimage

tourism phenomena which may be defined as the sum of beliefs, ideas and impressions on a destination (Crompton, 1979). The study has been undertaken with the following objectives:

a. To analyse the destination image of Kailash-Manasarover that draws the pilgrim tourists of different religious faith.
b. To evaluate the status of access routes to Kailash-Manasarover availed by the Indian pilgrim tourists.

MATERIALS AND METHODS

Most of the researches on Kailash Manasarover are either philosophical or merely the religious interpretation of history. A geographical study is therefore something which has different focus emphasizing on the intercourse between history and religious culture concerning specific space from the perspective of man-nature dynamism. Thus the anthropological aspects reflected in the study co-exist with an attempt to take adequate account of the regional geography of pilgrimage. Methodologically it recasts pilgrimage with the positivistic approach beyond the fold of historicism. For existential appreciation of the data in the context of religious experience, the travel blogs written by the pilgrim tourists who made Kailash Manasarover journey during the last five years have been consulted. Google search engine is applied to analyse the service quality available for pilgrims during the road journey from Indian territory. Face book and Twitter comments have been utilized to compare the attraction, accommodation and accessibility status of the Uttrakhand and the Sikkim route for Kailash-Manasarover apart from field interviewing conducted at Almora and Gangtok in Uttrakhand and Sikkim respectively. Questionnaires have been mailed further on request of 47 pilgrim tourists who trekked the route. For the subjective assessment of destination image, the focus group method (Dezsi, et al. 2014) has been used. Intentionally only the trekkers were incorporated in such survey with equal importance on Uttrakhand route and Sikkim route for the purpose of comparative analysis. Who opted for helicopter service are excluded considering them as pseudo pilgrims since sacrificial scale is the determinant of pilgrim character and pilgrim tourists are those who make a balance between sacrificial attitude and desire for consumption during travel.

As there is no one standard method available for analysing image, individual methodical approaches and procedures (Matlovičová and Kormaníková, 2014) have been applied. The sacred journey of Hindu pilgrims initiates from two base stations in Indian territory: Almora of Uttrakhand and Nathu La of Sikkim. Since adverse climatic situation prevails at Nathu La, it was found convenient to take interview of the pilgrim tourists at Gangtok, the capital city of Sikkim, where they have been sheltered after completion of their return journey. The researchers have adopted software based qualitative multi attribute model (Taskova, et al. 2007) for

analyzing their feedbacks in the context of attraction, accommodation and accessibility status of these two routes. DEXi is a capable software for such qualitative multi-criteria decision modeling and support (Bohanec and Rajkovic, 1990) facilitated by expert system and machine learning (Rozmanet al, 2009) contributing to the development of attribute trees.An evaluation and analysis of options registered in Likert scale has been adopted contributing to the generation of graphical outputs for Uttrakhand route and Sikkim route that approaches to Mount Kailash from different directions.

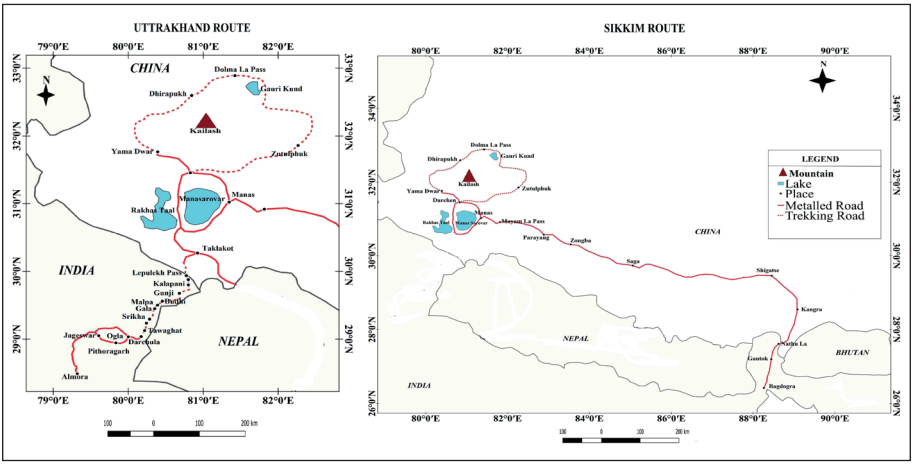


Figure 2
Uttrakhand Route and Sikkim Route for Manasarover Pilgrimage
Source: *Prepared by the Authors, 2020*

DISCUSSION AND ANALYSIS

The spirit of a place lies in its landscape (Relph, 1976) from which its destination image could be categorized as permanent (Lane, 2001). Kailash is conceived as the dwelling place of Hindu God Shiva as described in Mahanivanatantra (a 13th century treatise).There are two glacial lakes among which Hindu pilgrims cognize Manasarover as sacred and Rakhastal (literally means demon's lake, also called Ravanasarover after the name of demon king Ravana) as profane. The name 'Manas'(meaning mind in Sanskrit language) has its origin in the myth that the lake (called sarover in Sanskrit) has been created from the mind of Lord Brahma, one of the supreme Hindu trinity. The lake is also considered as the abode of celestial spirits and the water of it is symbolic of nectar. For Hindu pilgrims, it is the paradise land of Lord Brahma and by circumambulation of the lake, they could earn the merit to get rid of all the evil deeds performed in a mundane life. According to Hindu philosophy, one action is instrumental in bringing reaction and if sin is committed, prosecution

is inevitably awaiting in due course. Circumambulation, according to Hindu belief is instrumental to destroy the sins, which motivates the Hindus for a pilgrimage overcoming all the hardships to a contested site, characterized by conflict over its access and usage (Digance, 2003).

The Kailash Manasarover is contested because of the claim of Jains, Buddhists and Bons apart from the Hindus. According to Jain scriptures, it is place of *Nirvana* (salvation) of the first preacher of Jainism named Adinath Rashbhanatha, popularly known as Rasbha. It is noteworthy to mention that among the 24 preachers of Jainism called *Tirthankara*, the first 22 were imaginative non-historical figures. Jains of India believe that Rasbha went to Tibetan Kailash with ten thousand monks, which seems to be practically impossible viewing the nature of physiography and climate of Tibetan Kailash. Similarly a Buddhist belief exists that Buddha flew magically to the mountain by air route in 5th century B.C. (when there was no aircraft) along with five hundred monks in search of an image of future Buddha from Magadha (ancient Bihar of India). The Mandala peak (called 'Mt. Buddha Throne') nearby is revered for the symbolic presence of the impression believed as the left foot print of the Master, engraved at the site where he magically landed from sky. After recovery of the aforesaid image, it was given in the custody of indigenous serpent king, who supposed to be resided inside the mountain. With such belief, the mountain is considered sacred by the Buddhists worldwide.

For the Bonpos, the mountain is sacred since it accommodates 360 deities of them connected with 360 days of lunar cycle in a palace protected by a red bird, a turquoise, a tortoise and a Chinese tiger in all four directions. Further in Bonpo view, the universe is covered by atmosphere like a tent and Mount Tise is supporting this tent lying at the middle (Loseries-Leick, 1998). It is noteworthy to mention that in Indian tradition, there is similar concept of such mountain called Mount Meru from where four major rivers namely Indus (northward), Karnali (southward), Brahmaputra (east) and Sutlej (west) descends (Ali,1966) Tibetan traditions describe the association of supernatural elements like Naga, Garuda, Raksha and Yakhas as integral part of Mount Meru (Beer, 2003),which is conceived as the axis mundi. The term axis mundi is defined as a cosmic axis through which prayer of devotees from earth directly ascends to the heaven and blessing from heaven descends to the devotees (Eliade, 1969). For all the traditions, Mount Kailash is thus serving as a pole connecting between supernatural and natural world. It has been accessed from different base stations situated in India, Nepal and China. The following routes are noteworthy:

i. Road from Lhasa, the ancient capital of Tibet now under the control of China.
ii. From Gangtok(capital city of Indian state Sikkim for which the route is popularly called Sikkim route) through Nathula pass.
iii. From Kathmandu (Nepal) via Kerung.

IV. From Kathmandu, the capital city of Nepal via Nepalganj (at the India-Nepal border) in order to cater Indian pilgrims mostly.
V. From Almora(in Uttarkhand state of India), called Uttarkhand route.

Sikkim routes is among the first three routes which follow the mortorable China National Highway 219, that penetrates through a number of high altitude passes. The route from Nepalganj (Nepal) and Almora (Uttrakhand) are historical pilgrimage routes which reaches the destination via Taklakot (the name given to Burang town, the administrative centre of Burang Country of Tibet). It is a popular place for acclimatization for them who reach the place by air route. They used to stay at least for a day and there develops even star hotels to cater them. All categories of hotels are available because the trekkers of Uttrakhand routes also reach this town and take rest after seven days of their journey (Table 1). To reduce the hardship of these pilgrims, the attempt of India government to construct a motorable road becomes a matter of recent border dispute between Nepal and India. The road building is

Table 1 Uttrakhand Route: A bird's eye view.

Day	Segment	Distance and Time	Attraction	Remarks
1	Almora (1610m) to Darchula (930m) via Pithoragarh	210 km. 7 hours by Car	Pithoragrah Fort, Mountain and Lake view, Narayan Ashram and Temple	Transportation for trekking initiated from Darchula
2	Darchula (930m) to Gala (1230m)	19 km. 5 hours by trek	Waterfall and mountain View	Easy trek
3	Gala (1230m) to Budhi (2740m)	18 km. 6hour trek	Waterfalls and mountain View	Moderate trek; Landslide prone area.
4	Budhi (2740m) to Gunji (4940m)	17 km. 7 hours trek	Temple, waterfall, snow clad mountain View	Moderate to difficult trek.
5	Gunji (4940m) to Kalapani (4823m)	19 km. 6 hours trek	Source point of Kali River, temple, historical villages and medicinal plant	Moderate to easy trek through a landslide prone area.
6	Kalapani (4823m) to Nabhidang (5035m)	5 km. 4 hours trek	Om Mountain, Waterfall, sunrise view of snow clad mountain	Difficult trek due to high altitude. The newly built road by BRO (Border Road Organization) of India approaching to Lepulekh pass on which border dispute between Nepal and India arises.
7	Nabhidang (5035m) to Taklakot (3975m) via Lepulekh Pass	10 km. trek and 120 km by bus.	Snow covered Lepulekh Pass.	Difficult trek of 2 km.

Source: *Prepared by the Authors*

started from the tri-junction of Indo-Nepal-China border by the effort of Indian army. The road from Navidang to Kalapani is already in operation. With the extension of this road up to Gala in future is planned to facilitate a comfortable journey as the alternative of a very difficult trek.

Pilgrimage tourism service quality of this route has been compared with the Sikkim route from Nathula with application of DEXi software. The relative importance of attributes has been expressed by weightages, which are estimated from the rules maintained by DEXi using a linear regression method (Bohanec et al. 2013). The perception evaluation results on journeys in two routes namely Almora to Taklakot and Nathula pass to Manasarover have been shown in Fig-3 as determined by DEXi from the input data and application of its inherent decision rules.

Evaluation results

Attribute	Almora to Taklakot	Nathula pass to Manas Sarovar
Pilgrimage-Tourism Service Quality	Satisfied	Satisfied
Attraction	***Very Satisfied***	Good
Physical	***Very Satisfied***	Satisfied
Mountain View	***Very Satisfied***	***Very Satisfied***
Lake and Waterfall	Satisfied	Satisfied
Medical Plants and Parks	Satisfied	**Unsatisfied**
Cultural	Satisfied	Satisfied
Religious Background	Good	Good
Cultural Programme	Good	Sometimes
Accomodation	Good	***Very Good***
Asthetic	Good	***Satisfied***
Food Service	Healthy	***Very Healthy***
Pilgrim-Tourist Service	Satisfied	Satisfied
Accessibility	Need Improve	***Satisfied***
Transport and Communication	Good	***Satisfied***
Risk Avoidance	**High**	***Abscent***
Other Service	Satisfied	***Very Satisfied***

Figure 3
Evaluation results of Pilgrimage Tourism rervice quality using 5.04 software
Source: *Prepared by the Authors, 2020.*

Fig-4 represents the result graphically in which 100% satisfaction constitutes the end points, i.e. represented as "very satisfied". It is observed that visitors are "very satisfied" for Almora to Taklakot trek route whereas the attraction status of motorable road from Nathula pass to Manasarover is comparatively less as expressed with the term "satisfied". In order to improve the attraction status, revitalization of ethnographic museums of monasteries on the way is possible. Indoor microclimate monitoring for long term protection of exhibits (Radvan, et al. 2017) following the Romanian model applied for historic wooden church (Onet, et al. 2020) could be adopted as a sustainable strategy in this context. Conserving and preserving cultural heritage is an interdisciplinary field, the success of which

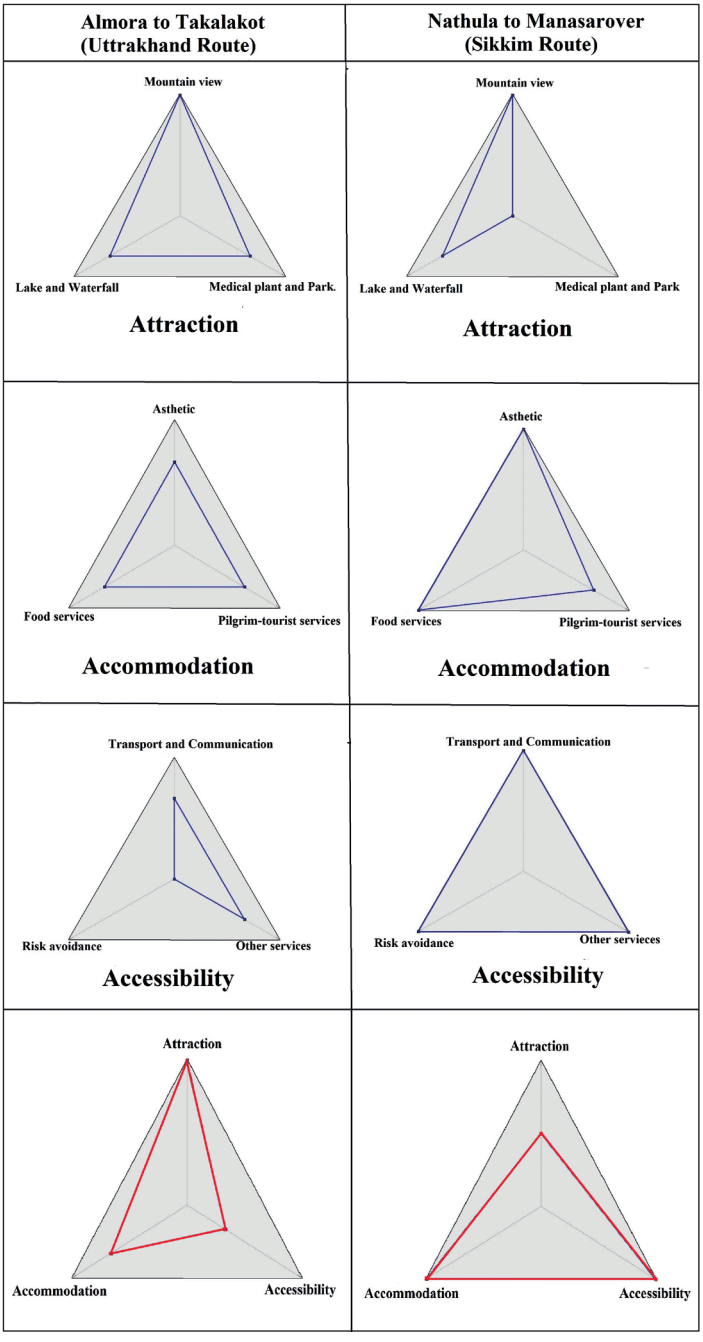


Figure 4
Comparative route status predicted by DEXi 5.04 software
Source: *Prepared by the Authors, 2020*

depends on the level of collaboration between restorers, archaeologists, art historians, museum curators and professional conservators (Indrie, et al. 2019).

Accommodation facilities of pilgrim tourists available on the Almora to Taklakot road are responded as "good" whereas from Nathula pass to Manasarover journey, it obtains a better feedback (i.e."very good") in hierarchical arrangement. The analysis reveals that the status of accessibility must be improved for the route from Almora to Taklakot. Tourists are pleased on the accessibility status from Nathula pass to Manasarover because they enjoy the advantage of Chinese National Highway. As and when the motorable road in Uttrakhand route will start serving the pilgrim tourists, the pilgrimage tourism business of China flourished due to advantage provided by China National Highway 219 will be decayed and it may be one of the reasons for which China is opposing the India's road construction project.

On the way to Kailash via Nathu La pass,Shigatse (3858m) is famous for viewing snow peaks including Mount Everest. The historical Sakya Monastery is the additional cultural attraction of this place for the visitors. Saga (3700m) is the next halt in this route which is a 495 km drive by car. Saga (3700m) to Manasarover (4800m) is about 8 hours of drive (distance: 480 km.) via Zhongba (4742m) which is a halt point for the availability of various categories of hotels. From Zhongba, Manasarover is reached through Parayang and Mayum La Pass (5200m), which separates the headwaters of Brahmaputra and Indus in Tibet. After completion of rituals at Manasarover, pilgrim tourists are taken to Darchen via Rakhastal for circumambulation called Kailash *Parikrama* (Table-2 and Fig-5).

Table 2: Circumambulation Route availed by the pilgrim tourists.

Day	From	To	Distance	Activities of Pilgrims
1	Darchen (4700m)	Dhirapuk (4850m)	Darchen to Yama Dwar- 8 km by car. Yama Dwar to Dirapuk -12 km by trek	The main attraction of this trek segment are: a. A shrine named Yama Dwar. b. Chuku Gompha. c. Charan Sparsh Site.
2	Dhirapuk (4850m)	Zutulpuk (4790m)	22 km. (9 hours trek).	The main attractions are Gaurikund (waterbody) and Dolma pass (5630m),a sacred place of Buddhist pilgrims. Northern and eastern portion of the Mount Kailash are viewed from here.
3	Zutulpuk (4790m)	Darchen (4700m)	8 km. (2 hours trek)	The main attraction is Zutulpuk Monastery. Eastern and Southern portion of Mount Kailsh are viewed from here.

Source: *Prepared by the Authors,2020*

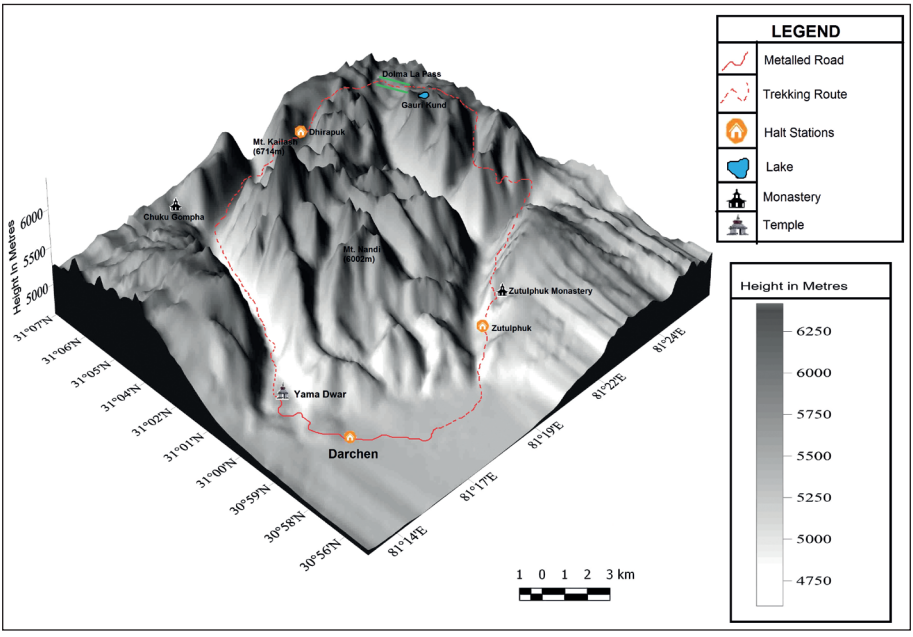


Figure 5 Mount Kailash Parikrma trek route
Source: *Prepared by the Authors, 2020*

CONCLUSIONS

A collective spiritual carnival is noticed in Kailash circumambulation on account of its varying destination image among the pilgrims of diversified ethnicities. It is noteworthy to mention that the region itself is the habitat of the ethnic group who is influenced by Chinese food, art and printing but inspired from various literary and cultural elements from India since time immemorial (Jackson and Cabezon, 1996). Tibetan script was developed from Indian *Devnagari* (ancient Indian script) by the efforts of the Tibetan students who were sent to the ancient Indian Buddhist Universities for learning and translating the treatises. Kalachakra Tantra is another example of cultural tie that has been developed in Tibet assimilating the Indian ideas of Tantric Buddhism with pagan culture of the Tibetan Bonpos known for the black magic, sorcery and witchcraft. The Bons believe that Tonpo Shenrab, the founder of their shamanistic religion (worshipped in Tibetan monasteries as equivalent to Sakyamuni of Buddhism) descended from heaven via Yangdrung Gutse, i.e. the Mount Kailash. They believe that Tanpo Shenrab used to roam the territory known as Shangshung (Gibbons and Pritchard-Jones, 2006), riding on the legendary Khyung bird (identical with the great Garuda bird of Indian belief), whose silver castle is situated less than 100 km south west of Kailash. As he mediated below the Mount Kailash, according to their belief, the mountain was under their religious

possession. Such metaphors on spiritual landscape shape the cultural image of the place encouraging pluralism and coexistence.

Milarepa, a Buddhists monk compelled the Bonpos to make a retreat to the Mountain Bon Re near Lake Manasarover.This is the evidence that co-existence was once challenged by conflict as a social process. According to a popular legend, a competition between Milarepa (1052-1135 A.D.) and Noro Bonchug, a Bon Shaman was held to reach the summit of Kailash. Though the Shaman was a reputed black magician, Milarepa reached the summit before him miraculously riding on the first rays of the sun and touched the summit. The eight step marks on the southern slope of mountain is believed to be gorged out as the surprised Shaman discovering his competitor at the top dropped his drum, which trembled down the mountain registering eight bounces (Gibbons and Pritchard-Jones, 2006). For these distinctive eight steps, the Jains refer this mountain as Astapada (*Asta* means eight and *Pada* refers to step marks). Thus the mountain geomorphology found explanation in folklore, which is another innovative aspect in shaping the destination image.

Spiritual magnetism in the destination image of Mount Kailash for the pilgrim tourists however lies in its association with Shiva and Buddha, the two dominant and spiritual symbols of the Himalayan region (Pandit, 2017). Mount Kailash as a unique geomorphosite has strengthened the Hindu claim of its association with Lord Shiva, who is conceived as the cosmic male. Hindu spiritual belief stresses on the union between cosmic male and cosmic female and Manasarover is perceived as the all-powerful female entity. The geomorphology of Mount Kailash resembles the *Lingam*, the male genital organ (worshipped as the symbol of Lord Shiva), while the glacial lake Manasarover symbolizes *Yoni*, the female organ. The cult fertility concept thus contributes in cognition of destination image by providing a spiritual explanation of regional geomorphologies. The folklores associated with the specific geomorphosites sustain the pluralism representing the destination environment as the melting pot of different Asian religious cultures. Motivated by their own spiritual narratives hidden in destination image, devotees from diverse background consider Kailash morphologically as the pivot of earth, a journey to which leads a pious soul to achieve the goal of salvation.

Acknowledgement:
We truly thank the agencies engaged in pilgrimage-tourism business from Indian territory to allow the access to the respondents for data acquisition.

REFERENCES

ALI, S.M. (1966). *Geography of the Puranas*. New Delhi: People Publication.

BEER, R. (2003). *A Handbook of Tibetan Buddhist Symbols*. Chicago: Serindia Publications.82-84.

BOHANEC, M., RAJKOVIC, V. (1990). DEX: An Expert System Shell for Decision Support. *Sistemica*, 1, 1, 145-157.

BOHANEC, M., ZNIDARSIC, M., RAJKOVIC, V. et al. (2013). Dex Methodology: Three Decades of Qualitative Multi-Attribute Modeling. *Informatica*, 37, 49-54.

BOWEN, J.R. (2002). *Religious in Practice: An Approach to the Anthropology of Religion*. Boston: Allyn and Bacon, 223.

CAMPO, J.E. (1998). American Pilgrimage Landscape. *Annals of the American Academy of Political and Social Sciences*, 558, 1, 40-56.

COHEN, E. (1992). Pilgrimage Centers Concentric and Excentric. *Annals of Tourism Research*, 19, 1, 33-50.

COLLINS-KREINER, N. (2009). The Geography of Pilgrimage and Tourism: Transformation and implications for applied geography. *Applied Geography*, 30, 1, 153-164.

COLLINS-KREINER, N. (2010). Geographers and Pilgrimages: Changing Concepts in Pilgrimage and Tourism Research. *Tijdschriftvooreconomische en sociafegeografie*, 101, 4, 437-448.

CROMPTON, J.L. (1979). An assessment of the image of Mexico as a vacation destination and influence of geographical location upon that image. *Journal of Travel Research*, 17, 4, 18-23.

DEZSI, S., RUSU, R., ILIES, M., ILIES, G., et al. (2014). The role of Rural Tourism in the Social and Economic Revitalisation of Lapus Land (Maramures County, Romania). *Geoconference on Ecology, Economics, Education and Legislation*, *2*, 783–790.

DIGANCE, J. (2003). Pilgrimage at Contested sites. *Annals of Tourism Research*, 30, 1, 143-159.

ECK, D. (2012). *India: A Sacred Geography*. New York: Harmony Books.

ELIADE, M. (1969).*The Quest, history and meaning in religion*. Chicago and London: University of Chicago Press.

GIBBONS, B., PRITCHARD-JONES, S. (2006). *Kailash and Gage: Land of the Tantric Mountain*. Varanasi: Pilgrims Publishing.

ILIES, A., HURLEY, P. D., ILIES, D. C., BAIAS, S. (2017). Tourist Animation-a Chance for Adding Value to Traditional Heritage: Case Studies in the Land of Maramures (Romania). *Revista de Etnografie Si Folclor-Journal of Ethnography and Folklore*, 1–2, 131–151.

INDRIE, L., OANA, D., ILIEȘ, M., ILIEȘ, D.C., et al. (2019). Indoor Air Quality of Museums and Conservation of Textiles Art Works. Case study: Salacea Museum House, Romania. *Industria Textilă,* 70(1), 88-93. https://doi.org/ 10.35530/IT.070.01.1608

JACKSON, R.R., CABEZON, J.I. (1996). *Tibetan Literature: Studies in Genre*. New York: Snow Lion Publication.

LANE, B.C. (2001). *Landscape of the Sacred: Geography and Narrative in American Spiritually*. Baltimore and London: The John Hopkins University Press.

LOSERIES-LEICK, A. (1998). *On the sacredness of Mount Kailash in the Indian and Tibetan sources*. MCKAY, A. (eds) *Pilgrimage in Tibet*. Richmond: Curzon press, 143-164.

MATLOVIČOVÁ, K., KORMANÍKOVÁ, J. (2014). City Brand-Image Associations Detection. Case Study of Prague. *SGEM 2014, Psychology & Psychiatry, Sociology & Healthcare, Education,* Conference Proceedings, 2, 139–146.

MATLOVICOVA, K., KOLESAROVA, J. (2011). Destination Image and Possibilities of its formation: A case study of the image of the Thailand as a tourist destination perceived by Slovaks. *Central European Regional Policy and Human Geography*, II, 1, 5-20.

MAZUMDER, S., MAZUMDER, S. (2004). Religion and place attachment: A study of sacred places. *Journal of Environmental Psychology*, 24, 385-397.

MCKAY, A. (1998). *Pilgrimage in Tibet*. IIAS, England: Curzon Press Ltd.

ONET, A., ILIES, D. C., ILIES, A., HERMAN, G. V., et al. (2020). Indoor air quality assessment and its perception. Case study–historic wooden church, Romania. Romania. *Romanian Biotechnological Letters,* 25(3), 1547-1553. https://doi.org/10.25083/rbl/25.3/1547.1553

PALMER, C.T., BEGLEY, R.O., COE, K. (2012). In defence of differentiating pilgrimage from tourism. *International Journal of Tourism Anthropology*, 2, 1, 71-85.

PANDIT, M. K. (2017*). Life in the Himalaya*. London: Havard University Press.

PRANAVANANDA, S. (1949). *Kailash-Manasarover*. Calcutta: S.P. League, 133.

RADVAN, R., RATOIU, L., & CHELMUS, A. (2017). Indoor Microclimate Monitoring for Long-Term Conservation of the Archive of the Institute of Ethnography and Folklore" Constantin Brailoiu" Multimedia Collection. *Revista De Etnografie Si Folclor-Journal of Ethnography and Folklore*, *1–2*, 152–171.

RELPH, E.C. (1976). *Place and Placelessness*. London: Pion Ltd.

RINSCHEDE, G. (1992). Forms of religious tourism. *Annals of Tourism Research*, 19, 1, 51-67.

ROZMAN, C., POTOCNIK, M., PAZEK, K., BOREC, A., et al. (2009). A Multi-Criteria Assessment of Tourist Farm Service Quality. *Tourism Management*, 30, 5, 629-637.

SHINDE, K. A. (2011). *Sacred Landscape, Sacred Performance, Connection and Cacophony.* SINGH, R.P.B. (eds). *Holy Places and Pilgrimages: Essays on India*. New Delhi: Shuvi, 127-146.

SNELLING, J. (1983). *The sacred Mountain*. London: East-West Publication

SOPHER, D.E. (1987). The Message of Place in Hindu Pilgrimage: A Geographical Viewpoint. *National Geographical Journal of India*, 33, 4, 353-369.

SPENGEN, W.V. (1998). *On Geographical and Material Complexity of Tibetan Pilgrimage*. MCKAY, A. (ed), *Pilgrimage in Tibet*. IIAS. UK: Curzon Press, 35-51.

STODDARD, R.H. (1987). Pilgrimage along sacred paths. *The National Geographical Journal of India*, 33, 4, 448-456.

TASKOVA, K., STOJANOVA, D. BOHANEC, M. et al. (2007). A Qualitative Decision-Support Model for Evaluating Researchers. *Informatica*, 31, 479-486.

TURNER, V. (1973). The centre out there: Pilgrim's Goal. *History of Religions*, 12, 3, 191-230.

TURNER, V., TURNER, E (1969). *The ritual Process*. London: Routledge.

FOLIA GEOGRAPHICA • ISSN 1336-6157 (hard copy) • ISSN 2454-1001 (online)

TOURISM IN BIHOR COUNTY, ROMANIA TRENDS AND PROSPECTS

Grigore Vasile HERMAN [A], Norbert BANTO [B], Tudor CACIORA [C], Vasile GRAMA [D*], Mihaela UNGUREANU [E], Sorin FURDUI [F], Raluca BUHAȘ [G], Sorin BUHAȘ [H]

Received: May 2, 2020 | Revised: October 25, 2020 | Accepted: November 7, 2020
Paper No. 20-62/2-573

Abstract
Tourism is one of the most emerging activities with social, economic and environmental impact and requires serious efforts by researchers to identify the mechanisms that govern this phenomenon. The present study aims to be an inquiry of the 2019 trends in tourism in Bihor County (Romania), seen as basis for delineating perspectives in this regard. We collected data from 118 representatives of various accommodation structures by applying face to face questionnaire, seen as main actors in the genesis, evolution and dynamics of local tourism. The results shaped the trends for tourism in Bihor County at the level of year 2019, as a support for the prospects to be followed on short term horizon (2 years). Both, results and conclusions of the study highlighted the existence of dysfunctions in terms of trends and prospects for tourism in Bihor County.

Key words
Bihor tourist destination, trends, perspectives, tourist services, tourism.

INTRODUCTION

Tourism represents a complex economic sector, in full expansion and diversification, and is one of the priorities for the contemporary society due to the multitude

A University of Oradea, Faculty of Geography Tourism&Sport, Oradea, Romania *grigoreherman@yahoo.com*
B Bihor Destination Management Agency, Primăriei street no. 2, Oradea, Romania *bnorbert24@yahoo.com*
C Doctoral School in Geography, University of Oradea, 1 University Street, Oradea, Romania, *tudor.caciora@yahoo.com*
D* University of Oradea, Faculty of Geography Tourism&Sports, Oradea, Romania *vasile.grama2014@gmail.com* (corresponding author)
E Bihor Destination Management Agency, Primăriei street no. 2, Oradea, Romania *umihaela59@yahoo.com*
F Bihor Destination Management Agency, Primăriei street no. 2, Oradea, Romania, Doctoral School in Geography, University of Oradea, 1 University Street, Oradea, Romania, *sorinfurdui82@yahoo.com*
G University of Oradea, Faculty of Social Sciences, Oradea, Romania *ralubuhas@gmail.com*
H University of Oradea, Faculty of Geography Tourism&Sport, Oradea, Romania *sorin.buhas@gmail.com*

of benefits it generates. Among these, the psycho-social (cure and physical and mental recovery, recreation and leisure, escape from everyday life) and economic benefits (development of local economies) stand out. Regardless of its spatial dimension, the complexity of tourism is generated from the specifics of this activity that harmoniously integrates and exploits all environmental components. Each of these components is "dependent upon other parts for success in attracting, servicing, and satisfying the tourist" (Mill and Morrison, 1985). Studies on the implications of tourism on destinations have been discussed around issues such as destination marketing (Dawson et al., 2011; Dezsi et al., 2014; Ilieș et al., 2017), destination image (Govers et al., 2007; Matlovičová and Kolesarova, 2011; Chakrabarty and Sadhukhan, 2020), destination competitiveness (Morgan et al., 2004), local business network (Morgan et al., 2003), and destination planning (Formica and Kothari, 2008).

Given this aspect, to which others which concern the need for environmental conservation and protection are added (Ianoș et al., 2012; Ilieș et al., 2018; Andronache et al., 2019; Herman et al., 2019a,b; Andria et al., 2020; Nesticò and Maselli, 2020), also doubled by the need for a sustainable exploitation in order to develop local economies and communities (Drăghici et al., 2015; Herman et al., 2017; Grecu et al., 2019; Gilliland et al., 2020), the need to identify and know trends as basis for perspectives in a tourist destination area stands out. Because tourist destinations are unique areas due to their identity-constitutive elements, identifying and establishing trends in tourism are particularly difficult and complex operations that require time, resources and specific methods of scientific investigation (Ilieș et al., 2016; Safarov et al., 2020). The tourism policy makers, destination organizations and service providers have to be set up such that they seek to provide high-quality visitor experiences that are profitable to destination stakeholders while ensuring that the destination is not compromised in terms of its environmental, social, and cultural integrity (Goeldner et al., 2000).

In this context, the knowledge of the tendencies and perspectives of a tourist destination area represents a major coordinate with a fundamental role in the crystallization of tourist strategies to be followed on a short-medium term horizon. A lot of studies limit their attention only on communities and there is a lack of theoretical approaches to guide a researcher to develop an understanding of a tourist destination from an integrated, multiple, different time frame (Hanpachern and Chatkaewnapanon, 2013). To conduct the present study, we consulted representatives of accommodation services, as direct exponents with important roles and functions in shaping and defining tourist destinations. Both internal aspects of the organization (tourism services and programs, staff, promotion system and the average occupancy rate) and external ones (tourists and their requests) were investigated. The image of the tourism in the analysed destination and the cognition of its trends served to easily foreshadow the perspectives, based on the

vision of tourist service providers and starting from their intentions (regarding the development of new tourist programs and services), expectations (of the local and central public authorities), perceptions (regarding the local tourist heritage), and proposals they have (the development of tourism in the immediate future - next two years).

The literature review regarding trends in tourism highlighted a series of problems that targeted tourists (Gabor and Oltean, 2019; Law et al., 2019; Ketter, 2020), the promotion system (Matlovičová et al., 2019; Herman et al., 2020; Sun et al., 2020), the management system (Matlovičová and Husárová, 2017; Ryan, 2018; Labanauskaitė et al., 2020), the economic efficiency (Baker et al., 2016; Balli et al., 2018; Belke et al., 2018; Gozgor and Demir, 2018; Tsui et al., 2018; Dogru et al., 2020; Wang et al., 2020).

Just as the past represents the foundation and the insertion element that gives specificity to tourism, so the trends are guidelines according to which the perspectives of tourism in a given area are drawn. Considering this, we aimed to capture the current trends of tourism in Bihor county (Romania) based on data collected from accommodation service providers. Together with other public and private actors, they are directly involved in the insertion, evolution and dynamics of tourism in the studied destination (Herman et al., 2019c,d). Creating a real image of the present tourism situation in a given destination, by identifying and knowing its trends, represents an informational support with role in outlining the perspectives of tourism in the analysed area.

METHODOLOGY

Study area

Bihor county, located in the north-western part of Romania, on the border with Hungary, is one of the most complex tourist destinations (Figure 1). In this sense, a contribution has the large and varied number of tourist resources, both natural and anthropic. The territory of Bihor county is presented in the form of a natural amphitheatre with an opening to the northwest, which rises from the Crișurilor and Barcău Plain, over Crișana Hills, to the highest peaks of the Apuseni Mountains (Cucurbăta Mare peak - 1849 m), offering a variety of superlative tourist attractions, among which some of them are unique such as karst forms and phenomena, as well as numerous possibilities for relaxation, recreation and leisure. The mountain area, represented by the Plopiș Mountains, Pădurea Craiului Mountains, Vlădeasa Mountains, Bihor Mountains, Codru-Moma Mountains fascinates with the variety and attractiveness of the landscape: valleys with wild gorges guarded by strong cliffs, karst plateaus which shelter caves and impressive potholes, waterfalls, lakes, mineral springs, flora and fauna preserved in protected areas etc.

Figure 1
Study area

At the foot of the mountain, the meandering rivers and the multitude of anthropic lakes complete the variety of tourist attractions and, as such, the offer for leisure activities. To all this richness of thermal mineral waters is added, which are exploited in nationally and internationally popular spas. The anthropic tourist attractions (cultural-historical, technical-economic, and ethnographic) enhance the

attractiveness of the natural environment and, at the same time, provide new recreational attributes to the area. Dacian and medieval fortresses, archaeological sites, museums, public and private collections, memorial houses, theatres and libraries, buildings with various architectural styles, wall and wooden churches, houses with traditional architecture, crafts and customs, all these are just a few of the human creations that give identity to the place. Tourists visiting Bihor county can discover balneoclimateric resorts (Băile Felix, Băile 1 Mai, Stâna de Vale), cultural destinations (Oradea, Salonta, Beiuș), mountain areas (Pădurea Craiului Mountains, Vârtop area, the karst plateau of Padiș, Boga Valley, Sighiștel Valley), protected natural areas (Apuseni Natural Park, Cefa Natural Park, various nature reserves and Natura 2000 sites), rural settlements preserving traditions and customs (localities on Crișul Repede Valley, Crișurilor Plain, Ier - Barcău area, Depression of Beiuș) etc.

Data analysis

Our research was conducted based on a sociological survey and data were collected by applying a questionnaire using face-to-face technique (Bryman, 2012; Chelcea, 2007; Wendt et al., 2019). Data were collected between April and May 2019, and the questionnaire was applied to 118 representatives of the most important tourist accommodation structures in Bihor county (Oradea city, Băile 1 Mai and Băile Felix spa resorts, Sânmartin locality, area of Crișurilor Plain, Vârtop holiday village, Pădurea Craiului ecotourism destination, Budureasa commune, and Valea Iadului area). The questionnaire was structured on thirteen questions regarding the trends (services and leisure programs, staff, tourists and their requests, accommodation services and the promotion system used) and perspectives of tourism in Bihor county (in terms of tourism attractions and services, the level of involvement of local and central public authorities in tourism development, as well as specific proposals coming from accommodation providers). Five identification items for the consulted providers were also used (name of the unit, type of unit, comfort category, number of rooms and accommodation places).

RESULTS AND DISCUSSIONS

In order to identify trends and perspectives for tourism in Bihor county, 118 accommodation providers were consulted, which represents 26.4% of the total number of accommodation service providers, and 39.2% of the accommodation capacity (Table 1).

Table 1 Information regarding the consulted accommodation providers

Tourist destination	Type of accommodation structures					Comfort category Stars/ daisies			No. of rooms	No. of places	No. of questioned structures
	Hotel	Pension	Rooms to let	Tourist villas	Other categories	1-2 **	3***	4****			
Oradea city	17	7	2	2	0	5	13	10	768	1430	28
Sânmartin locality	2	14	5	2	1	6	18	0	268	613	24
Băile Felix spa resort	9	9	1	2	1	3	16	3	1419	2776	22
Budureasa commune	0	9	1	0	3	8	5	0	124	295	13
Pădurea Craiului ecotourism destination	0	6	0	0	4	5	5	0	78	185	10
Băile 1 Mai spa resort	1	5	1	0	0	2	5	0	114	238	7
Valea Iadului area	0	5	0	0	0	2	3	0	59	131	5
Crișurilor Plain	1	2	1	0	0	2	1	1	46	88	4
Vârtop holiday village	1	4	0	0	0	1	4	0	87	196	5
Total of consulted subjects	31	61	11	6	9	34	70	14	2963	5952	118
Total for Bihor county*	54	212	109	35	38	149	279	20	7448	15199	448

* Source: **** (2019). Classified tourist accommodation structures (LSPTC), http://turism.gov.ro/web/autorizare-turism/.*

*** 2019. Structurile de primire turistică cu funcţiuni de cazare clasificate (LSPTC) [Classified tourist accommodation structures (LSPTC)]. Available at: http://turism.gov.ro/web/autorizare-turism/.

Trends for tourism in Bihor county

In order to capture the specific trends for tourism in Bihor county our investigation followed some specific indicators, namely: tourist services provided, leisure programs, staff, tourists and their requests, average occupancy of accommodation structures and the promotion system used.

Taking into consideration that tourist services represent an important segment of the tourism economy in Bihor county, with effects towards the increase of tourists` satisfaction in this area, we investigated all related services offered by accommodation providers. Data analysis outlines the following results: the most common services are those related to car parking (78.8%), followed by dining services (44.06%), swimming pool (25.4%), sauna (19.4 %), gym (18.6%), treatment (11.01%) etc. Therefore, the primary needs, accommodation and food, are a priority, followed by those aiming the safety of goods (car parking), relaxation (sauna, swimming pool, etc.), and physical and mental recovery (treatment) (Figure 2).

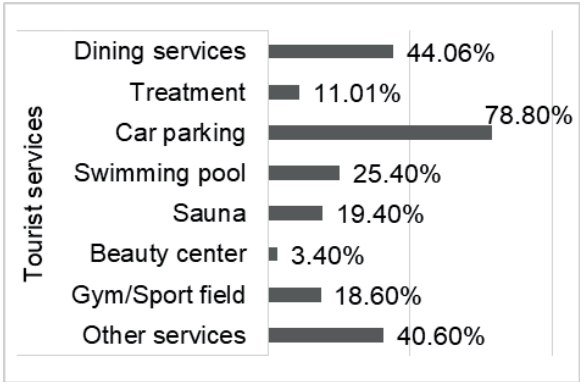


Figure 2
Proportion of tourist services (%)

The analysis of leisure programs highlights the concern of accommodation providers to diversify the offer for leisure tourist activities. Thus, 44.1% (52 respondents) of the analysed tourist structures organize, individually or in partnership with other entrepreneurs, visits to various tourist attractions; 24.5% (29 respondents) facilitate the access of tourists to various specific cultural events, and 11.1% (13 respondents) offer other types of leisure programs (Figure 3).

The staff involved in tourist services and its management is one of the greatest challenges that the economic sector of tourism faces and must overcome. This conclusion emerges from the professional characteristics of employees in tourism, on the one hand, and from tourism specificities, seen often as a seasonal activity, on the other hand. Thus, 83.1%, respectively 98 accommodation providers declared that they have difficulties in recruiting employees. Bihor county as a tourist destination requires qualified trades, among which: maid (65.3%), waiter (44.8%), cook (44.8%), receptionist (24.4%), event organizer (3.1%) and others (7.1%) (Figure 4).

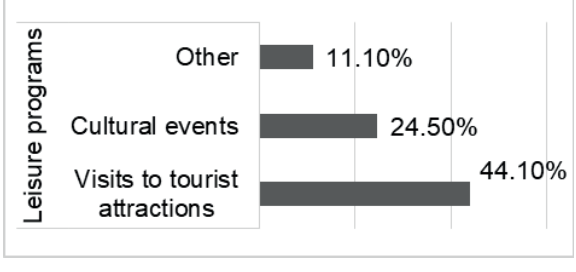


Figure 3
Tourist leisure programs organized individually or in partnership with other operators (%)

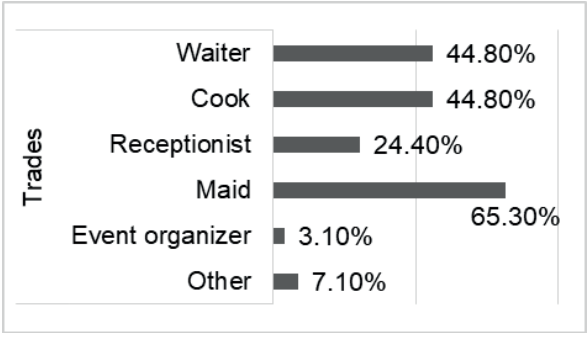


Figure 4
Tourism trades with deficit on the labour market (%)

The analysis of employees' ability to communicate in a foreign language outlined that fact that they are not ready to welcome tourists from all over the world, because only 15.8% of them understand and speak English, followed by employees who speak Hungarian (7.2%), Italian (5.8%), German (4.8%), Spanish (1.7%) etc. (Figure 5). Therefore, Bihor is not an open and a European destination from this point of view, because the staff involved in tourism sector does not have the necessary skills to communicate with foreign tourists, which, according to respondents, would represent a percentage of 22.92%.

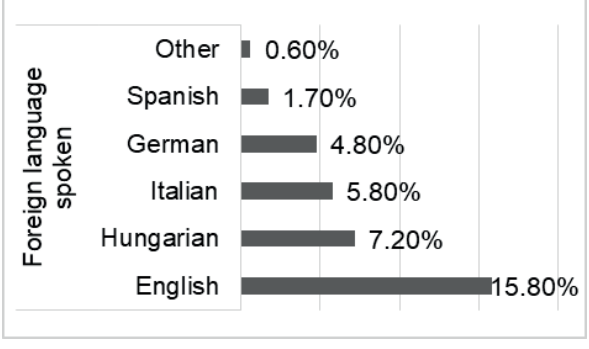


Figure 5
Foreign languages spoken by employees in tourism (%)

The analysis of tourist circulation by countries of origin reveals the following aspects: the neighbouring country, Hungary, is the main source of tourists for Bihor county, with a 22.6% of the total international arrivals. Next, there are tourists arriving from Germany (14.8%), Poland (14.1%), Italy (8.9%), Austria (6.7%), Czech Republic (6.3%), Slovakia (4.1%), France (3.6%) etc. (Figure 6).

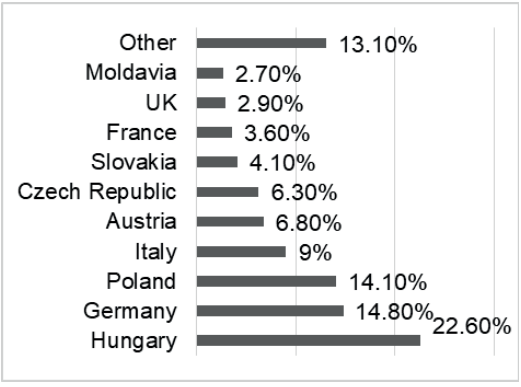


Figure 6
Tourists by country of origin (%)

The analysis of the occupancy rate of the tourist accommodation structures, at the level of year 2018, shows the existence of an evolutionary trend defined by four time intervals (two increase, two decrease) separated by two periods of maximum activity (August and December) and two periods of lower activity (February and November). The first growth interval is longer (six months), from March to July, while the second growth interval is shorter and overlaps over December, when, the second peak of activity is also registered. As for the decreasing periods, they overlap over September and October (the first period of decrease), respectively over January, the second period of decrease (Figure 7).

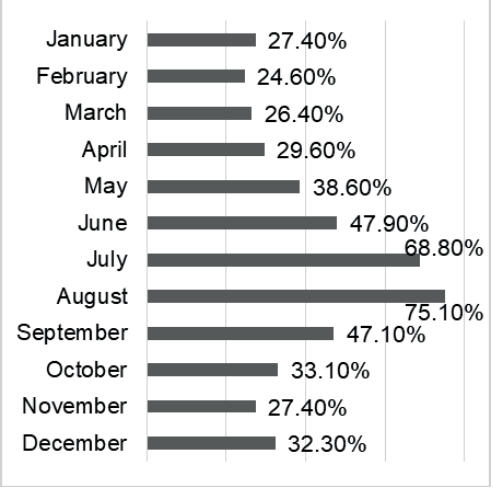


Figure 7
Occupancy rate for tourist accommodation structures in Bihor county in 2018 (%)

In 2018, the average occupancy rate in Bihor county as a tourist destination was of 39.8%. At provider level, the existence of oscillations in time and space by typological categories (hotel, hostel, tourist pension etc.) was observed. Thus, the analysis of this indicator in 2018 by typological categories highlights the increase of the occupancy rate in hotel structures (52%), followed by tourist pensions (29.1%), hostels (24.2%) and other categories of accommodation structures (19.3%), while the analysis of the occupancy rate at the level of tourist destination highlights some defining particularities for each tourist destination.

The analysis of tourists` requests (from Romania or abroad) presented to the accommodation providers refers to their needs to visit tourist attractions (53.3%), participation in various cultural events (11.8%) and other requests (0.8 %) (Figure 8).

Regarding leisure programs offered and organized individually or in partnership with other operators, there is a growing demand from tourists for activities which facilitate visits to various tourist attractions, while for participating in local events and other services is a low interest (Figures 3, 8).

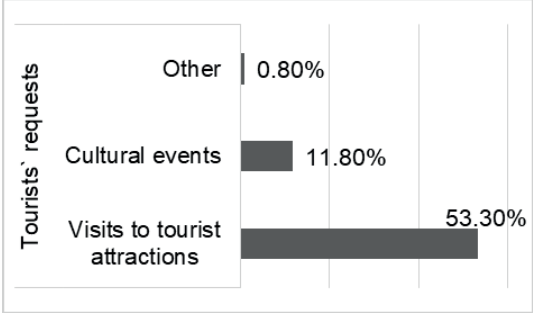


Figure 8
The most frequent tourists' requests addressed to the accommodation service providers from Bihor county (%)

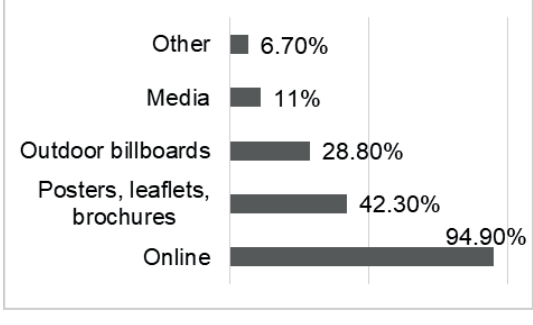


Figure 9
Marketing strategies for tourist services (%)

Promotion is an extremely important variable for tourism, and is a key element in the process of construction and strengthening the image of a tourist destination. Research on ways to promote tourism in Bihor county highlights the prevalence of the online environment (94.9%), followed by promotion through leaflets, posters and brochures (42.3%), billboards (28.8%), media (11%), and others (6.7%) (Figure 9).

The most common ways of Internet marketing are own websites (79.5%), posts on social media (64.3%), social media advertising (45.5%), booking websites (32.1%), as well as other methods (3.6%) (Figure 10).

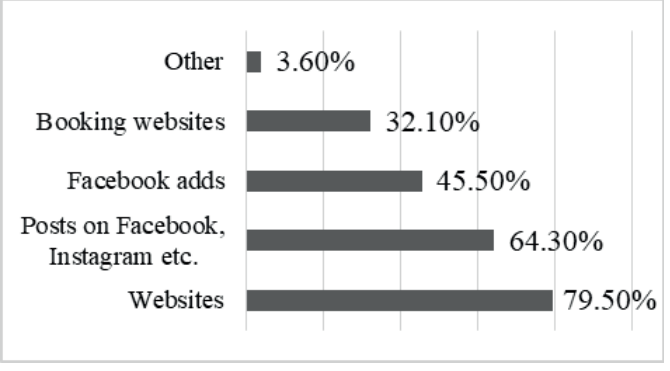


Figure 10
Online marketing strategies (%)

Perspectives for tourism in Bihor county

Considering the current trends of tourism in Bihor county, we can easily foreshadow its perspectives based on the analysis of the intentions, expectations, perceptions and proposals of the accommodation service providers from the investigated tourist destination.

The intentions concern the tourist services that respondents intend to establish and promote in the next two years. The analysis reveals these intentions only in the case of 34 providers (28.8%), grouped by value classes as follows: small (45%), medium (27%), high (11.8%), very high (15.7 %). Among the tourist services that they intend to develop in the future are those related to serving meals and organizing trips to various tourist attractions, followed by SPA services and those related to rural tourism (Figure 11).

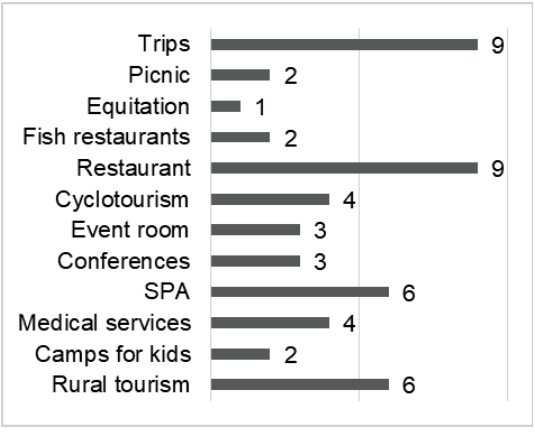


Figure 11
Services that tourist providers intend to develop and promote in the next two years (number of cases)

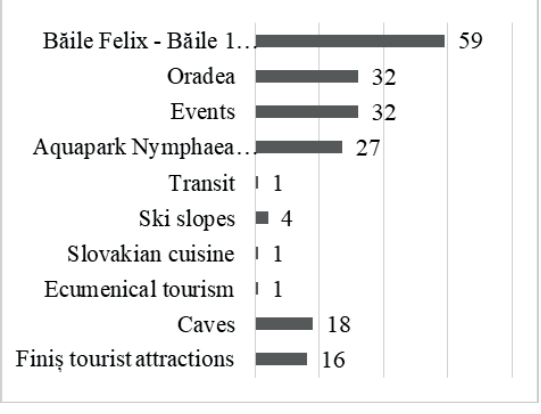


Figure 12
Tourist attractions, events and activities that draw tourists to Bihor county (number of cases)

The perception of tourist attractions, events and activities that draw tourists to Bihor highlighted the following situation presented by typological categories: small (24%), medium (20.9%), high (12.6 %), very high (42.5%). According to accommodation providers, a major importance in attracting tourists to Bihor has Băile Felix - Băile 1 Mai spa area, Oradea and the events that take place here, Aquapark Nymphaea Oradea, while, at the opposite pole, we find the ecumenical tourism, Slovak cuisine and transit tourism (Figure 12).

The expectations of the accommodation service providers (84 providers, 71.2%) regarding the involvement of central and local public authorities grouped respond-

ents in the following categories: small (13.2%), medium (19.8%), high (12.6%), very high (42.5%). The highest expectations were related to infrastructure development, restoration of tourist attractions, event planning to draw tourists and an integrated marketing of accommodation and dining structures. At the other end, we find the cooperation with the private sector, tax reduction and controls in order to avoid the tax-free economy and unfair competition in tourism (Figure 13).

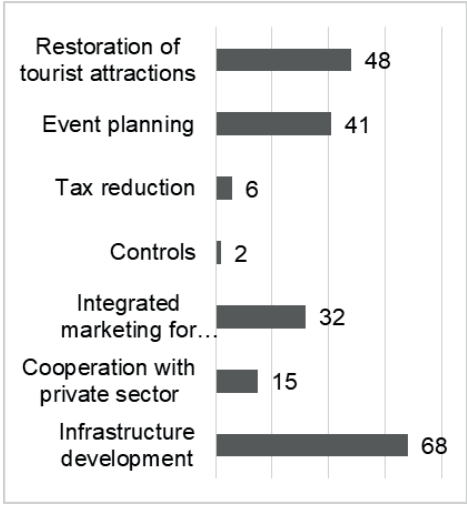


Figure 13
Service providers` expectations in relation to public authorities (number of cases)

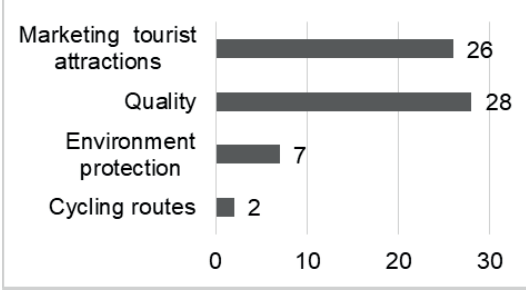


Figure 14
Proposals on tourism development (other than those related to public administrations) (number of cases)

Only 40 providers (33.8%) offered proposals on tourism development, and the number of these proposals was also relatively low (64 proposals). Proposals coming from the accommodation providers from Bihor referred to increasing the

quality of tourist services, intensifying efforts to promote tourist attractions in the near future, the need to protect the environment and exploiting local tourist offer through cycling (Figure 14).

CONCLUSIONS

Bihor county is one of the emerging tourist destinations at national level, where balneary, balneoclimateric, cultural and mountain tourism are intertwined in a balanced way. In order to capture the trends and perspectives of tourism in Bihor county, 188 accommodation providers were consulted from all tourist micro destinations (Oradea, Băile 1 Mai and Băile Felix spas, Sânmartin locality, Crișurilor Plain, Vârtop holiday village) Pădurea Craiului ecotourism destination, Budureasa commune and Valea Iadului area).

In order to analyse trends, we consulted accommodation service providers regarding related services and tourist programs they offer, staff employed, tourists and the promotion system used, while the perspectives emerged from the analysis of respondents` intentions for the next two years, their expectations (regarding the involvement of central and local public authorities in tourism development), their perceptions (related to tourist attractions, events and activities that could draw tourists in Oradea city and Bihor county), and their proposals on tourism development, other than those related to the local and central public administrations.

Among the defining trends for tourism in Bihor county we can outline:

- the major share of tourist services related to primary needs (accommodation and food), followed by those aiming security (such as car parking), relaxation (sauna, swimming pool etc.), as well as physical and mental recovery;
- preoccupations regarding the organization of visits to tourist attractions in the area in order to diversify and prolong the time tourists spend in the investigated destination, doubled by tourists` requests in this regard;
- economic agents in tourism face major difficulties in recruiting competent staff;
- the need to identify new solutions and mechanisms to reduce tourist pressure during the peak season, from July and August, for certain tourist areas and providers;
- the major importance of the online environment, respectively of own websites and simple posts on social media (Facebook, Instagram) in order to promote Bihor county as a tourist destination.

The perspectives of tourism in Bihor county, based on current trends, also emerge from the weighted analysis of the intentions, expectations, perceptions and proposals of the accommodation service providers from Bihor. Thus, we can state that the consulted providers have low intentions in designing, diversifying and promoting tourism services in the next two years, and relatively moderate proposals on tourism development, while they have high expectations from central

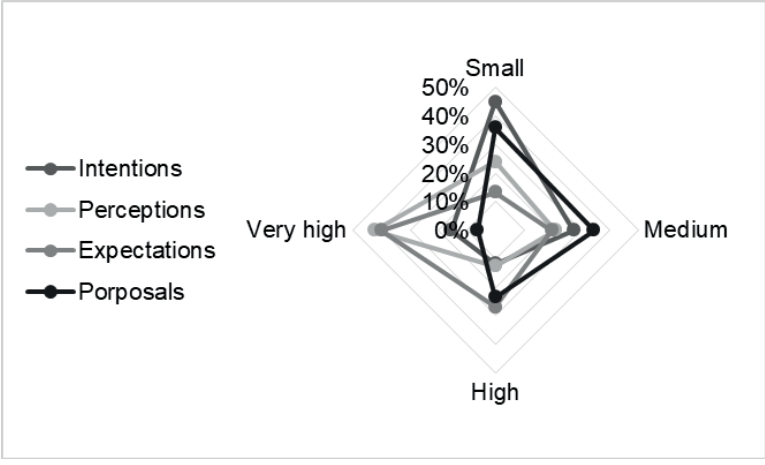


Figure 15
Relationship between intentions, perceptions, expectations and proposal

and local public authorities (regarding infrastructure development, restoration of tourist attractions, event planning to draw tourists, and the integrated promotion of accommodation and public catering structures), and high perceptions related to the capacity of tourist attractions, events and activities to draw tourists in Bihor county (Figure 15).

The stakeholders of tourism and hospitality may boost their business in the light of findings uncovered under the empirical lens of this study. From the predictive analysis of the trends and perspectives of tourism in Bihor tourist destination for the next two years we can see an exacerbation of the problems regarding the human resource involved in tourism, as well as the two opposite moments - the peak seasons (July-August), when because of the large flow of tourists the services decrease considerably in terms of quality, and the off-season when the tourist activity proves to be economically unprofitable, for most of the consulted units.

Among the measures that need to be taken we mention the strengthening on cooperation between local public authorities, representatives of tourism service providers and the University of Oradea, in order to prepare future graduates who will be involved in the local tourism labour market. In this sense, this study is a support of future scientific approaches that will aim to identify the needs of the local tourism labour market and to adapt the educational instructional process, starting from the realities found on this study. The peak-season, off-season and the periods between them, have been extensively analysed not only in scientific writings but also by the local and regional statistical institutions reports. However, given the high degree of complexity of tourism, imposed by local and regional determinants, particular analyses are required for each area in the future, some-

times for each service provider, to identify the best solutions which can be taken in order to reduce the amplitude between peak-season and off-season and achieve a sustainable tourism.

REFERENCES

ANDRIA, J., DI TOLLO, G., Pesenti, R. (2020). A heuristic fuzzy algorithm for assessing and managing tourism sustainability. *Soft Computing*, 24(6), 4027-4040.

ANDRONACHE, I., MARIN, M., FISCHER, R. et al. (2019). Dynamics of forest fragmentation and connectivity Using particle and fractal Analysis. *Scientific reports*, 9(1), 1-9.

BAKER, S.R., BLOOM, N., DAVIS, S.J. (2016). Measuring economic policy uncertainty. *The Quarterly Journal of Economics*, 131(4), 1593-1636.

BALLI, F., SHAHZAD, S.J.H., UDDIN, G.S. (2018). A tale of two shocks: What do we learn from the impacts of economic policy uncertainties on tourism? *Tourism Management*, 68, 470-475.

BELKE, A., DUBOVA, I., OSOWSKI, T. (2018). Policy uncertainty and international financial markets: the case of Brexit. *Applied Economics*, 50(34-35), 3752-3770.

BRYMAN, A. (2012). *Social Research Methods*, 4th edition, Oxford University Press, USA.

CHAKRABARTY P., SADHUKHAN, S.K. (2020). Destination Image for Pilgrimage and Tourism: A Study in Mount Kailash Region of Tibet. *Folia Geographica*, 62.

CHELCEA, S. (2007). *Metodologia cercetării sociologice. Metode cantitative și calitative [Methodology of sociological research. Quantitative and qualitative methods]*. Economic Publishing House, Bucharest.

DAWSON, D., FOUNTAIN, F., COHEN. D.A. (2011). Place marketing and wine tourism: Creating a point of difference and economic sustainability for small wineries, *6th AWBR International Conference*. Bordeaux Management School, BEM, France, June 9-10.

DEZSI, S., RUSU, R., ILIES, M. et al. (2014). The role of Rural Tourism in the Social and Economic Revitalisation of Lapus Land (Maramures County, Romania). *Geoconference on Ecology, Economics, Education and Legislation*, 2, 783–790.

DOGRU, T., BULUT, U., KOCAK, E. et al. (2020). The nexus between tourism, economic growth, renewable energy consumption, and carbon dioxide emissions: contemporary evidence from OECD countries. *Environmental Science and Pollution Research*, 1-19.

DRĂGHICI, C.C., PINTILII, R.D., PEPTENATU, D. et al. (2015). The role of SPA tourism in the development of local economies from Romania. *Procedia Economics and finance*, 23, 1573-1577.

FORMICA, S., KOTHARI, T.H. (2008). Strategic destination planning: Analyzing the future of tourism. *Journal of Travel Research*, 46(4), 355-367.

GABOR, M.R., OLTEAN, F.D. (2019). Babymoon tourism between emotional well-being service for medical tourism and niche tourism. Development and awareness on Romanian educated women. *Tourism Management*, 70, 170-175.

GILLILAND, T.E., SANCHIRICO, J.N., TAYLOR, J.E. (2020). Market-driven bioeconomic general equilibrium impacts of tourism on resource-dependent local economies: A case from the western Philippines. *Journal of Environmental Management*, 271, 110968.

GOELDNER, C.R., MCINTOSH, R. W., RITCHIE, J.R.B. (2000). *Tourism: Principles, practices, philosophies (8th edition),* John Wiley & Sons, Toronto.

GOVERS, R., GO, F.M., KUMAR, K. (2007). Promoting tourism destination image. *Journal of Travel Research*, 46(1), 15-23.

GOZGOR, G., DEMIR, E. (2018). The effects of economic policy uncertainty on outbound travel expenditures. *Journal of Competitiveness*, 10(3), 5-15.

GRECU, A., GRUIA, A.K., MARIN, M. et al. (2019). Specificity of Sustainable Structural Dynamics of Local Economy in Romanian Tourist Resorts. *Sustainability,* 11(24), 7155.

HANPACHERN, R., CHATKAEWNAPANON, Y. (2013). Understanding a tourist destination: a tourism history approach. *International Journal of Asian Social Science,* 3(12), 2399-2408.

HERMAN, G.V., DEAC, A.L., CIOBOTARU, A.M. et al. (2017). The role of tourism in local economy development. Bihor County Case Study. *Urbanism Architecture Constructions*, 8(3), 265-274.

HERMAN, G.V., GACEU, O., MESTER, C. et al. (2019a). Spatial analysis of water quality in natura 2000 Sites Bihor, Romania. *Journal of Environmental Protection and Ecology*, 20(4), 2121-2129.

HERMAN, G.V., ILIES, D.C., GACEU, O. et al. (2019b). Some considerations concerning the quality of groundwater in the Natura 2000 Lunca Barcaului (Barcaului Meadow) site, Romania. *Journal of Environmental Protection and Ecology*, 20(3), 1102-1109.

HERMAN, G.V., CACIORA, T., DUMBRAVĂ, R. et al. (2019c). Geographical Considerations Regarding the Tourist Information and Promotion Centers from Bihor County, Romania. *GeoJournal of Tourism and Geosites*, 27(4), 1439–1448.

HERMAN, G.V., WENDT, A.J., DUMBRAVĂ, R. et al. (2019d). The role and importance of promotion centers in creating the image of tourist destination: Romania. *Geographia Polonica*, 92(4), 443-454.

HERMAN, G.V., GRAMA, V., SONKO, S.M. et al. (2020). Online Information Premise in the Development of Bihor Tourist Destination, Romania. *Folia Geographica*, 62(1), 21-34.

IANOŞ, I., PEPTENATU, D., PINTILII, R.D. et al. (2012). About sustainable development of the territorial emergent structures from the metropolitan area of Bucharest. *Environmental Engineering & Management Journal (EEMJ),* 11(9), 1535–1545.

ILIEȘ, A., WENDT, J.A., ILIEȘ, D.C. et al. (2016). The patrimony of wooden churches, built between 1531 and 2015, in the Land of Maramureș, Romania. *Journal of Maps*, 12(sup1), 597-602.

ILIEȘ, A., HURLEY, P.D., ILIES, D.C. et al. (2017). Tourist Animation-a Chance for Adding Value to Traditional Heritage: Case Studies in the Land of Maramures (Romania). *Revista de Etnografie Si Folclor-Journal of Ethnography and Folklore*, 1–2, 131–151.

ILIEȘ, D.C., Buhas, R., Ilies, M. et al. (2018). Sport activities and leisure in Nature 2000 protected area-Red Valley, Romania. *Journal of Environmental Protection and Ecology*, 19(1), 367-372.

KETTER, E. (2020). Millennial travel: tourism micro-trends of European Generation Y. *Journal of Tourism Futures*. DOI 10.1108/JTF-10-2019-0106.

LABANAUSKAITĖ, D., FIORE, M., STAŠYS, R. (2020). Use of E-marketing tools as communication management in the tourism industry. *Tourism Management Perspectives*, 34, 100652.

LAW, R., LI, G., FONG, D.K.C. et al. (2019). Tourism demand forecasting: A deep learning approach. *Annals of Tourism Research*, 75, 410-423.

MATLOVIČOVÁ, K., HUSÁROVÁ, M. (2017). Potential of the heritage marketing in tourist destinations development. *Folia Geographica*, 59(1), 5-35.

MATLOVIČOVÁ, K., KOLESAROVA, J. (2011). Destination Image and Possibilities of its formation: A case study of the image of the Thailand as a tourist destination perceived by Slovaks. Central European Regional Policy and Human Geography, II, 1, 5-20.

MATLOVIČOVÁ, K., TIRPAKOVA, E., MOCAK, P. (2019). City brand image: semiotic perspective a case study of Prague. *Folia Geographica*, 61 (1), 120-142.

MILL, C.R., MORRISON, A.M. (1985). *The tourism system: An introductory text*. London: Prentice Hall.

MORGAN, N.J., PRITCHARD, A., PIGGOTT, R. (2003). Destination branding and the role of the stakeholders: The case of New Zealand. *Journal of Vacation Marketing*, 9(3), 285-299.

MORGAN, N.J., PRITCHARD, A., PRIDE, R. (2004). *Destination branding: Creating the unique destination proposition.* 2nd Edn., Oxford: Elsevier/ Butterworth Heinemann.

NESTICÒ, A., MASELLI, G. (2020). Sustainability indicators for the economic evaluation of tourism investments on islands. *Journal of Cleaner Production*, 248, 119217.

RYAN, C. (2018). Future trends in tourism research–Looking back to look forward: The future of 'Tourism Management Perspectives'. *Tourism Management Perspectives*, 25, 196-199.

SAFAROV, R.Z., SHOMANOVA, Z.K., NOSSENKO, Y.G. et al. (2020). Solving of Classification Problem in Spatial Analysis Applying the Technology of Gradient Boosting Catboost. *Folia Geographica*, 62(1), 112-126.

SUN, Y., LIANG, C., CHANG, C.C. (2020). Online social construction of Taiwan's rural image: Comparison between Taiwanese self-representation and Chinese perception. *Tourism Management*, 76, 103968.

TSUI, W.H.K., BALLI, F., TAN, D.T.W. et al. (2018). New Zealand business tourism: exploring the impact of economic policy uncertainties. *Tourism Economics*, 24(4), 386-417.

WANG, J., HUANG, X., GONG, Z. et al. (2020). Dynamic assessment of tourism carrying capacity and its impacts on tourism economic growth in urban tourism destinations in China. *Journal of Destination Marketing & Management*, 15, 100383.

WENDT, J., BUHAȘ, R., HERMAN, G.V. (2019). Experience of the Baile-Felix Tourist System (Romania) For the Protection and Promotion of the Grey Seal as a Brend on the Hel Peninsular (Poland). *Baltic Region*, 11(1), 109-116.

FOLIA GEOGRAPHICA • ISSN 1336-6157 (hard copy) • ISSN 2454-1001 (online)

CHANGES OF DISPERSED SETTLEMENTS IN RURAL CULTURAL LANDSCAPE FROM THE STRATEGIC PERSPECTIVE (WITH SPECIAL ATTENTION TO THE VILLAGE HRUŠOV IN CENTRAL SLOVAKIA)

Ján HANUŠIN [A*], Mikuláš HUBA [B], Vladimír IRA [C]

Received: April 28, 2020 | Revised: September 15, 2020 | Accepted: November 8, 2020
Paper No. 20-62/2-566

Abstract
The aim of this paper is to analyse changes of dispersed settlements in rural cultural landscape in municipality Hrušov (in the Krupinská planina plateau, Central Slovakia) with special focus on the development strategies applied in an effort to escape marginality. The area outside the core of the village is the unique dispersed settlement system with some specificities in rural development which are typical for marginal regions of Slovakia with such a type of settlement. The study deals with the development trends of the rural cultural landscape in the years 1950, 1986 and 2016 in the context of landscape changes in Slovakia. Attention is paid to marginality of the studied area, paradoxes and possibilities of its development and to the monitoring of the dispersed settlement developments in the light of local, regional, national and international documents. Diversified activities accomplished by the municipal authority, important local leaders and amenity migrants can serve as worth to follow example of how to restore care for a cultural landscape with dispersed settlements and how to eliminate the negative phenomena associated with the marginality status.

Key words
Rural cultural landscape, dispersed settlements, marginality, development programmes and documents, village Hrušov (Veľký Krtíš district).

INTRODUCTION AND OBJECTIVES

Despite the continuing concentration of population in compact (clustered) settlements, the dispersed (scattered) settlements are still present in various forms in most parts of the world. A dispersed settlement with its residential and landscape structure, distinctive building and social and cultural peculiarities, has created unique manifestations of material and spiritual heritage and genius loci. A landscape with dispersed settlements represents in most regions across Europe a spe-

A* Institute of Geography, Slovak Academy of Sciences, Štefánikova 49, 814 73 Bratislava, Slovakia, *hanusin@savba.sk* (corresponding author)
B Institute of Geography, Slovak Academy of Sciences, Štefánikova 49, 814 73 Bratislava, Slovakia, *mikulas.huba2@gmail.com*
C Institute of Geography, Slovak Academy of Sciences, Štefánikova 49, 814 73 Bratislava, Slovakia, *geogira@savba.sk*

cific type of rural landscape that has experienced a significant change in the late twentieth and the early twenty-first century.

Social and technological modernization has affected almost all areas of the rural life. Rural restructuring has produced causally linked effects across a multiplicity of sectors with consequences that are qualitative as well as quantifiable (Woods 2005).

Huba (1989) states that a dispersed settlement only meant the relocation of a part of population to remote and unsuitable parts of the cadastre and that, to some extent, it always constituted an extreme and emergency settlement pattern. In spite dispersed settlements across Slovakia cannot be perceived as a marginal phenomenon. Municipalities with this form of settlement occupy 4,640 km^2, i.e. about 10% of the area of Slovakia (Verešík 1974). The above mentioned author identified 166 villages with dispersed settlements in 1961 where about 140,000 people (3.3% of the total population) lived in approximately 2,900 hamlets. Almost the same number of the population lived in these villages in 1991 (Spišiak 1998) which was 2.6% of the total population. Špulerová et al. (2017) identified the occurrence of functioning historical structures of agricultural landscape with dispersed settlements in Slovakia on an area of 21,298 ha, which is about 1% of the area of agricultural land. As an indirect comparison, information may be given that while almost 12% of the Spanish population lived in dispersed settlements in 1960, it dropped to 7% in 1980 (Amate et al. 2016).

The regional names of dispersed settlement patterns in Slovakia do not reflect their size or morphological characteristics (*kopanice, lazy, štále*, Verešík, 1974). Although the terminology is not consistent even between the UK and the USA, the individual hierarchical levels of dispersed settlement are sometimes more precisely distinguished there, e.g. isolated farmsteads, hamlets and scattered dwellings in UK, (Bibby & Brindley, 2013). Therefore, it was important to choose the English equivalent for the Slovak term *laz* used in the studied region, which refers to an isolated group of houses representing the basic unit of the dispersed settlement system. As the closest term to the Slovak term *laz*, we chose the term hamlet in the sense of Roberts (1996), which is defined as a settlement unit of 3-8 farmsteads located 250 m apart from each other, which best corresponds to the settlement pattern of the study area, while recognizing the differences arising from different historical, cultural-economic and physical-geographical environment.

The Hrušov dispersed settlement area along with the most of the regions with dispersed settlement in Slovakia belongs to the so-called cumulative peripherality/marginality regions defined on the basis of four groups of indicators: human resources, economic potential, household amenities, and accessibility of economic centres (Halás 2008, Halás and Hurbánek 2008). The availability of labour, education, services and transportation significantly influences the quality of life in such regions. The supply of job opportunities and services is not sufficient, and

particularly young and well-educated people often respond by emigrating. On the other hand, in some such regions we surprisingly find specific features of human and social capital (active mayor, group of local activists, folklore groups, local entrepreneurs, NGOs, etc.), which relativize the status of traditionally understood marginality in many ways.

Despite numerous factors limiting the continued existence of dispersed settlements, there are several conventions, strategies, programmes, schemes, instruments, and measures directly or indirectly supporting its continued existence at the international, national, regional, micro-regional and local levels. The individual international documents that the Slovak Republic has undertaken to comply with form a framework, an argumentative basis and, to a limited extent, support mechanisms in favour of preserving/protecting a dispersed settlement and the surrounding rural landscape. They concern strategic, institutional, environmental, economic, social and, last but not least, cultural issues.

The aim of the paper is to analyze on the example of the village Hrušov, with a large dispersed settlement, the development of the rural cultural landscape between the years 1950, 1986 and 2016 in the context of development trends in Slovakia and the EU. The development analysis is carried out in relation to its marginality and in the light of local, national and international documents, dealing with the local / regional (sustainable) development, countryside, territorial planning, strategy of agriculture, historical landscape protection / management, etc. On the basis of such an analysis the authors aim to indicate and generalize the alternatives of development and perspective of regions with dispersed settlements in Slovakia with special emphasis on the village of Hrušov. They consider dispersed settlements not only as ones slowly disappearing „cultural and economic relic of a museum nature", but perceive its maintenance, support and restoration with adequate consideration of current needs as an opportunity to maintain and restore / revitalize the historic cultural landscape in accordance with the principles of sustainable development.

THEORETICAL FRAMEWORK

Even more than half a century apart, we can agree with Birch (1967) that, despite their expansion, dispersed settlements are paid much less attention in scientific literature than compact settlements.

The definition of dispersed settlement is not unequivocal. As Schwartz (1989) pointed out, there is no generally accepted definition of the term dispersed settlement which is conditioned, among other things, by differences in the historical, social and cultural development of individual regions and, of course, differences in the natural environment. Amate et al. (2016) define dispersed settlement as a settlement area outside the core of the settlement that has no administrative and

legal personality, and which consists of one or a group of inhabited houses. Van De Velde et al. (2010) in a study devoted to Flanders, Belgium defined dispersed settlement as an area with a minimum distance of 150 meters between buildings. Omasta (2010) defines a dispersed settlement around Myjava in western Slovakia as a settlement in which there is at least one settlement located outside the main settlement of a territorial unit (usually a municipality) at least 200 m away from it. At the same time, these settlements form a larger whole, i.e. they cannot occur alone in the territory. Špulerová et al. (2017) characterize the historical structures of agricultural landscape (HSAL) of dispersed settlements as one of the four basic types of HSAL in which the determining element of land use are objects of dispersed settlement and small block mosaics of agricultural land, such as orchards, permanent grasslands or arable land (in the regions of southern Slovakia, rarely also vineyard plots).

Already the original Roman and barbaric settlements of Europe were largely dispersed and only at the beginning of the Middle Ages this model was abandoned and concentrated settlements prevailed (Hoffmann 2014). Later, in the pre-industrial period, many settlements were largely reliant on their own resources due to high transport costs preventing the establishment of permanent trade relations and creating conditions for a dispersion of population in the landscape (Sieferle 2001). In the second half of the 13th and in the 14th centuries, as a result of the division of aristocratic property, numerous one- and two-family residential units (scattered hamlets and small settlements) were established in Slovakia (Žudel 2010). Most of the dispersed settlements still existing in the Slovak Carpathians are considerably younger and were created in several settling waves between the 16th and 19th centuries (Hromádka 1943, Verešík 1974, Horváth 1980).

Ethnographers were pioneers in the interest in *kopanitse* dispersed settlement in Slovakia. Already at the beginning of the 20th century, several monographs devoted to this issue were published. Medvecký (1905) was one of the first who pointed out the transformation of seasonal settlements in the area (lazy) into permanent ones in the monograph *Detva*. In the work *Cerovo*, Chotek (1906) notices the transformation of temporary settlements in the village of Cerovo (in the Krupinská planina, plain), where there was a relative surplus of usable land due to low natality.

Because the study of dispersed settlements is of a complex nature, most studies have been carried out in geography and related sciences. In the first half of the last century, it was mainly the works of Martinka (1927), Janšák (1929), Deffontaines (1931), Hromádka (1943) and Fekete (1947), that laid the basis for research into this type of settlement in Slovakia. Later on, the issue of dispersed settlements from the geographical aspect was dealt with by Lukniš (1950, 1980), Verešík (1974), Lauko (1985), Huba (1986, 1989, 1990, 1997), Spišiak (1998), Petrovič (2006 a, b), Šolcová (2008), Omasta (2010, 2011), Zrníková and Hrčková (2012), Hanušin and Lacika (2017, 2018).

In addition to geographers and landscape ecologists, ethnologists (e.g. Priečko 2003, 2015, Švecová 1975, 1980, 1984, 1988), historians (e.g. Horváth 1980, Mésároš 1966, Prelovská 1987, Varsík 1972), territorial planners (e.g. Belčáková and Pšenáková 2013, Nahálka et al. 1966, Sitár 1967) also participated in the research of dispersed settlements. The phenomenon of dispersed settlement in Hrušov is relatively widely studied (Botík 1980, Brada et al. 2014, Hanušin and Lacika 2017, 2018, Švecová 1975, 1980, 1984, 1988, Zrníková and Hrčková 2012). Dispersed settlement research is gradually losing the predominant character of basic research and increasingly moves into application.

Dispersed settlements in several form occur in many countries around the world but the studies explicitly addressing this issue are relatively underrepresented. Studies from Japan are known from the 1950s (Matsumoto 1950, Okamoto 1955 and Takaki 1958). The theory of localization of farms in the USA Corn Belt, which are one of the types of dispersed settlements, was studied by e.g. Birch (1967) and Hudson (1969). The development of a specific form of dispersed settlement (*khutors*) in the European part of Russia was studied by Rostankowski (1982). Owen and Sarlov-Herlin (2009) studied dispersed settlements in the UK in terms of sustainability; Lake et al. (2014) studied dispersed farmsteads in Kent, UK. The prevalence of dispersed settlements in agricultural landscape of Ireland is highlighted by EPA (2008). Dispersed settlements – *tanye* – were studied in the Hungarian lowlands by Kovács and Farkas (2011), dispersed and decentralized settlements in Slovenia were analyzed by Černe (2004) and Hočevar (2012), in the eastern part of the Balkan Peninsula by Frolec (1980), in southern Spain by Amate et al. (2016). The position and development of dispersed settlements in the wider context of settlement systems have been studied by e.g. Fletcher (2019) and Troha (2017). Decades ago Dovring and Dovring (1965) have drawn attention to the link between farm settlements, landscapes and the social structure of the area.

In the 1980s, the Commission of the International Geographical Union (IGU) on Rural Development began to pay systematic attention to this issue. Among the several studies carried out on its platform, it is at least worth to mention the work of Leitmeir (1983) on rural settlement in the Alps, Rikkinen (1981) on scattered settlement in Lapland, Tiner (1983) on transport problems of small mountain settlements in northern Hungary, Chiffele (1983) on Swiss mountain farming policy and Almedal (1983) on the transformation of rural settlements in northern Norway. Other relevant research includes the work of Symon (1959) on the past and present of farming in Scotland, Ehlers (1974) on current trends and problems of agricultural colonization of boreal forests, or Majoral (1977) on the consequences of depopulation tendencies in scattered settlements in the Western Pyrenees.

As we have already indicated above, territories with dispersed settlement in Slovakia, including the territory studied by us, are referred to as marginal. Marginal and marginalized territories in cultural landscape represent a specific environment

with distorted functional and spatial relationships that result from the uneven functioning of mutually conditioned political, economic, social, cultural and environmental factors (Ira 2019). Marginality research focuses on many different topics considering the scale and the type of marginal region that the specific research is dealing with. The regions with traces of marginality, with clearly observable marginality issues and with severe marginality problems will probably attract the geographical research in fields of identification of marginal individuals or social groups, identification of the type of marginality, identification of consequences, identification of marginalizing factors, and identifying the role of geographical factors (Pelc 2017).

Several scholars tried to study marginality through specific approaches to go deeper into explanation. Leimgruber (1994) in his work defined marginal regions and proposed four different approaches: geometrical, ecological, economic, and social. He also mentioned political and cultural approaches. Ira et al. (2014) and Ira (2019) applied time-geographical approach analysing time-space behaviour of inhabitants living in marginal mountainous region. Poláčková (2010) has defined a political approach and identified four main trends of political marginality and its research in regions. She has also mentioned the perception approach focused on marginality through human perception, values and decisions. Marginality and marginal regions were also analysed in the context of globalization and deregulation (Leimgruber 2004). In a later published work Leimgruber (2007) states that marginality can be seen as a state of mind and it is subject to our respective value system. The study of the individual perception of marginality may contribute to the understanding of similarities and differences in defining marginality from two different perspectives: objective and subjective (Mikuš et al. 2016).

DATA AND METHODS

Basic indicators for assessing changes in the landscape with dispersed settlements were the nature of land cover and the number of hamlets which we processed and analyzed for the years 1950, 1986 (1990 for demographic data) and 2016. The period between the years 1950 – 1986 (1990) is referred to as the first period; the period between 1986 (1990) – 2016 was the second period. Settlement pattern of the study area consists of a core (densely built up area of the original settlement) and the network of hamlets spread over the rest of the cadastre. The observed time horizons express the state of land cover (LC) in the pre-collectivization period (1950), in the period of advanced collectivization (1986), and in the recent period (2016).

The basic database for the year 1950 was georeferenced sheets of the historical orthophoto aerial images of Slovakia from the same year (Historická ortofotomapa © GEODIS SLOVAKIA, s.r.o., et al.). Aerial images from 1986 were georeferenced to the S-JTSK coordinate system. The database for the preparation of the LC map for

the year 2016 consisted of relevant sheets of the aerial orthophotomap from 2003 updated based on the Google Earth map server (Google Earth Pro 2016). LC data were processed and analysed in ArcGis 10.1 and Excel. Although we mapped and interpreted a total of 15 LC types, for simplification we evaluated only 6 main types: arable lands, permanent grasslands (referred to as grasslands), forests and non-forest woody vegetation (referred to as forests), built-up areas in hamlets including adjoining gardens (referred to as hamlets) and areas with succession (referred to as succession areas). In defining and description of the land cover types a classification proposed by Oťaheľ et al. (2017) was adopted. The main types cover more than 95% of the area in all periods under review. When evaluating LC conversion, we followed the conversion tables as defined by Feranec et al. (2002); the extent of changes was obtained from the pivot table.

Detailed data on the population of each hamlet were obtained from the 1950 census (Národný archív SR 1950), documents for the proposal of the Territorial Plan of Hrušov (Kolektív 1990) and from the parish register (Matrika, Hrušov).

In our case study we have used both qualitative and quantitative factors to measure marginality. When we think of changes in cultural landscape, the thoughts about "marginality in the mind" can be identiefied indirectly through people's relationship to and a behaviour in the landscape / environment. The analyses of 20 structured interviews with local leaders and opinion makers and representatives of municipality in Hrušov (Huba and Ira 2020) revealed perceptions of respondents about how marginal they felt or not. The sampling was carried out using recommendations for the selection of interviewed persons proposed by the mayor and two members of the municipal council. It means that observer can determine whether local individuals or community have lost some decision power or not, and thus this process could be identified as a marginalisation process (Déry et al. 2012). As far as quantitative factors are concerned we have measured the marginality using data on: geographical remoteness (peripheral to the most developed and populous areas of the southern part of Central Slovakia); dispersed populations partly dependent on local limited resources, partly on resources obtained through jobs outside the municipality; actual lack, or low levels of physical and social infrastructure; lack, or low levels of access to the towns (cities) where services, facilities and economic opportunities are concentrated; "low productivity" of economic activities; and in the past decades the population with political influence on the decisions affecting their lives.

The last methodological step is a critical analysis of international and domestic Slovak publicly available documents, programmes and support schemes at various levels from the perspective of the issue of dispersed settlement and its possible future support.

STUDY AREA AND DEVELOPMENT OF CULTURAL LANDSCAPE WITH DISPERSED SETTLEMENTS

The main areas of the *kopanitse* dispersed settlement in Slovakia were defined and first named by Hromádka (1943). In a slightly amended form, this division was taken over by Nahálka et al. (1966), who used the names of orographic units used at the time to designate the main areas as a unifying criterion and, on this basis, set aside five areas and several sub-areas. Within this division, the village of Hrušov is located in the area of dispersed settlements in the Slovenské rudohorie (Slovak Ore Mountains) and the Krupinská planina (plain), specifically in the Krupina subregion (Fig. 1).

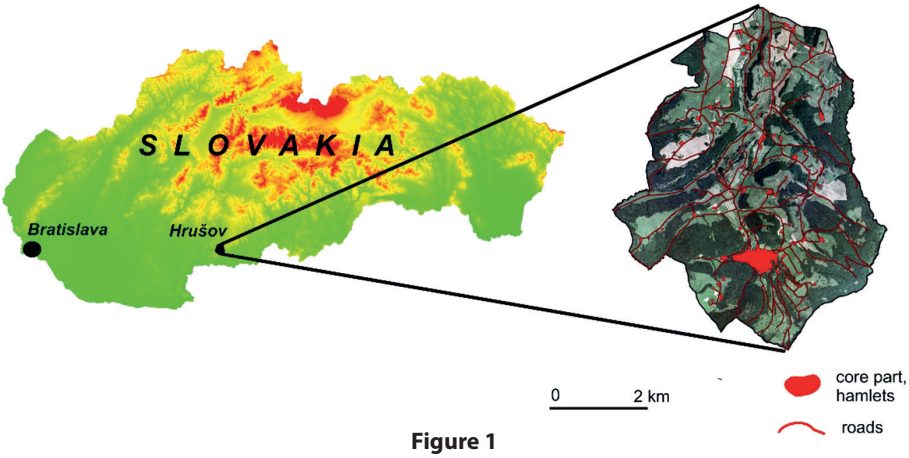


Figure 1
The study area

Most of the territory (the cadastral area) of the village Hrušov (2,331 ha) extends on the border of the Ipeľská kotlina basin and the Krupinská planina plain, known as the geomorphological sub-unit Modrokamenské úbočie slopes. The smaller northern part belongs to the Dačolomská planina plain geomorphological sub-unit (Mazúr and Lukniš 1978). The complex of volcanic-sedimentary rocks prevails in the whole study area. Altitudes vary between 200 – 521 m a. s. l.; the plains in the northern part reach an average of 450 – 490 m a. s. l. The location on the boundary of the plain and basin determines the nature of all components of the natural landscape. The average annual temperature is approximately 8.8 °C, the average annual rainfall amounts to less than 600 mm (Lapin et al. 2002). Poorly permeable volcanic rocks, lack of rainfall and location on the watersheds are the cause of low groundwater reserves. The soil cover is dominated by Cambisols. Oak forests with *Quercus cerris* and in higher positions Carpathian oak - hornbeam forests cover the majority of the area (Maglocký 2002).

The first written mention of Hrušov can be traced back to as early as 1272 (Kamasová and Bendík 1996). Around this period, a cultural landscape began to take shape – the settlement of Hrušov (today's core part) and a cultivated agricultural landscape in its hinterland which gradually expanded mainly to the north where there are relatively favourable conditions for agriculture. From the Middle Ages until the mid-19th century, three-field system of agriculture was applied. The dispersed settlement in its present form began to emerge at the end of the 19th century, as one of the youngest of its kind in Slovakia (Botík 1980). The hamlets were founded by locals, unlike most of the surrounding villages where the hamlets were founded by the immigrants from the northern regions (Švecová 1984). Later on, the hamlets have been transformed from seasonal to year-round housing. Gradually, most of the local people owned two homes – one in the core part and the other one in the hamlet. This double residency fully developed during the World War I (Brada et al. 2014). The double residency lasted almost the entire 20th century and undoubtedly affected the way of cultivation techniques and LC structure. Even in 1991, nearly half of the 437 houses in the area were hamlets (Program rozvoja obce Hrušov 2015).

Individual hamlets (*lazy*) are named after their founders and families, e.g. Matiašov vrch, Husár's settlement (Husár pusta), Brachovo (Brachova pusta,) and Stachov vŕšok. In the past, Hrušov suffered for a long time from the lack of water sources and transport connections, which made the daily life of its inhabitants difficult. Construction of the water supply system in the 1970s at least partially solved the problem of water scarcity. Even a long time after World War II, the village had no transport links to the surrounding area and its urban centres. The bus service from Vinice, a few kilometres south of Hrušov to the nearest town of Šahy did not start operating until May 1957. The electricity network for 60 families living in *lazy* became a reality in 1968. The new road to the towns of Krupina and Levice took the longest time to build. It was not completed until 1968. Larger construction activity after the stagnation caused by World War II took place at the turn of the 1950s and 1960s.

During the onset of socialism after 1950, unlike most of Slovakia, the process of collectivization of agriculture into cooperative farms (abbreviation for agricultural cooperatives in Slovak is JRD) did reach Hrušov. The character of LC inherited from the interwar period remained with little changes for the next decades. Land ownership rights completely changed. The peasants could not (except for small private farms) own the land, they could only use it. Foundation of JRD in 1979 changed the utilization of landscape and the way of life in the village albeit not totally. Small fields merged into large blocks where non-profitable, hard-to-reach fields in higher slope positions were afforested, management and service activities were centralized. Hamlets, as protuberant land management points, gradually lost their importance and many of them were later depopulated.

After the end of socialism in 1989, part of the land cultivated by JRD returned to private hands, part is managed by the agricultural cooperative in Cerovo. Local people continued to move out from hamlets to the core and the total population of the municipality decreased. Part of the houses in hamlets remained abandoned or their function converted to recreational. Abandonment of agricultural land continued. On the other hand, several new farmers came to Hrušov from outside.

RESULTS

Dispersed settlement and its demographical background

The basic demographic trend is the overall population decline of the municipality accompanied by population increase in the core part and a significant decline in hamlets (Fig. 2). In 1950, almost two-thirds of the population lived in hamlets which imply that most of the agricultural activities were carried out in the hamlets and their surroundings. The distribution of hamlets across the cadastre, the system of road network connecting individual hamlets and the position of core part is significantly determined by the morphological characteristics of the area (Hanušin and Lacika 2017).

The number of houses in hamlets varied from 1 to 12 during the monitored periods. Moreover, there were additional farm buildings across most of hamlets. The number of permanently inhabited houses did not change substantially over time which refers to a decrease in the average number of inhabitants in one house. The share of occasionally inhabited houses in the total number of houses in hamlets increased from 30% in 1990 to 35% in 2016. Most of the houses in hamlets have been built before 1945, and about a quarter of them were build between 1946 and 1980 . Construction considerably diminished (Kolektív 1990) later, which is related to the decline of population. While in 1950 there were 10 uninhabited hamlets, their number increased to 15 in 1990 and 22 in 2016. In the second period a kind of centripetal spatial concentration of the population associated with the abandonment of marginal, more distant hamlets can be observed. In 1950, the most populous hamlets were concentrated in the central and northern part of the area. In 1990, the zone of uninhabited hamlets concentrated near the south-eastern edge of the area. In 2016, the zone of uninhabited hamlets spread to the north. Many of them were on a flat plain with the best agroecological conditions. The average distance of uninhabited hamlets from the core part of Hrušov increased from 2,240 meters in 1990 to 3,000 in 2016. On the other hand, analogous values for inhabited hamlet dropped from some 3,000 m to 2,800 m, confirming the trend of depopulation of marginal hamlets. Part of abandoned houses in hamlets acquired a new, recreational function. In 2016, there were 65 occasionally inhabited houses, that is, 28% of the total number of houses.

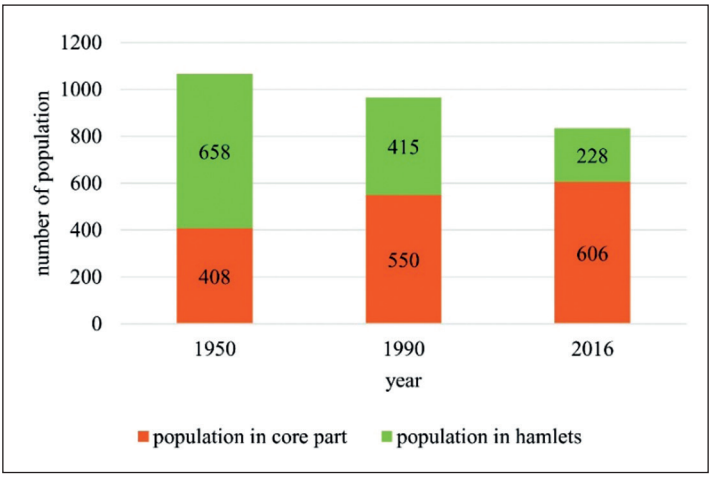


Figure 2
Population in core part and in hamlets

LC pattern and its changes

The general trend of LC changes is that of a decrease in the share of arable lands, grasslands and agricultural mosaics and increase in the share of forests (Fig. 3) indicating that the intensity of agricultural land use was declining. Overall, the increase

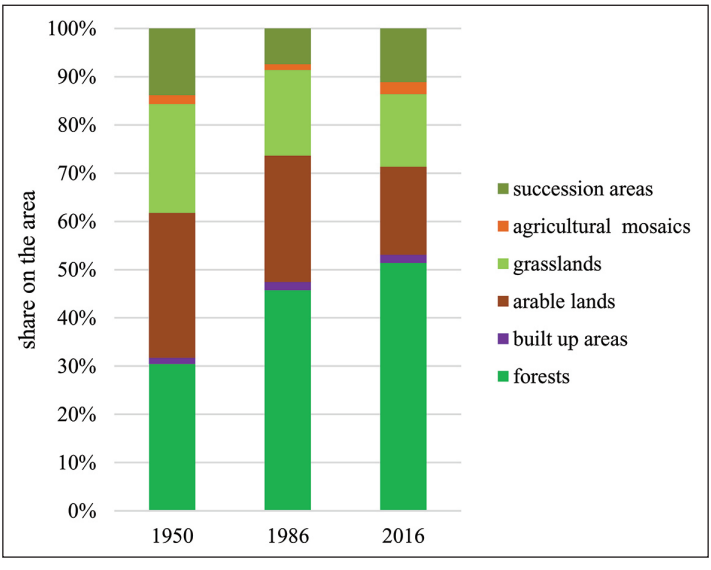


Figure 3
Land cover in 1950, 1986 and 2016

in forests was approximately the same as the total decrease in arable land and permanent grassland. The area of hamlets increased only very slightly. The common features of the distribution of the main LC categories in all observed years were the predominance of forests on the western, eastern and partially southern margins and in the sloping positions in the centre of the area.

As for LC conversion, no-change areas dominated (Fig. 4 a, b). Regarding the higher proportion of no-change areas, the second period was more stable compared to the first period, aforestation was the prevailing change in both periods. Other significant changes were the antagonistic changes in extensification and intensification of agriculture. In both periods, aforestation concentrated mainly in more sloping locations in the central and southern parts of the territory. Originally successive areas and areas of grasslands have been transformed into forests. Intensification of agriculture dominated in the northern plateau part of the territory, where the conditions for agricultural production are more suitable. During the extensification / intensification of agriculture, in most cases the grasslands changed into arable land and vice versa.

Dispersed settlement of Hrušov in relation to marginality

As already mentioned in terms of location within Slovakia, self-governing region and district, as well as in terms of limited transport accessibility, Hrušov is undoubtedly part of the marginal territory. In terms of natural soil fertility, climate and other natural conditions for agriculture, these are factors that enhance the territorial marginality.

Although marginality is generally considered a negative phenomenon that limits conventionally understood development and prosperity, in case of Hrušov we observe the efforts of the local community to "escape" marginality by preserving local traditions, farming, maintaining regional fruit varieties (gene pool), a healthy environment, a harmonious cultural landscape and the related quality of life. Hrušov eliminates negative aspects of marginality like few similar municipalities in Slovakia, partly due to quite suitable conditions for some types of agricultural production, but especially due to the systematic efforts of the municipality's management and active members of the local community. Thanks to this, Hrušov is not only a leader within the micro-region, but some of the local activities acquired a supraregional character. This applies in particular to the Hontianska paráda event, but also to the scope and quality of micro-scale (micro-regional) research and published outputs about the village and its population (see e.g. Bendík, ed., 2019), museum exhibitions, locally oriented educational infrastructure, local folklore ensembles, associations and so on.

Recently, another phenomenon that helps the municipality to escape marginality is that of "newcomers" which may significantly slow down the process

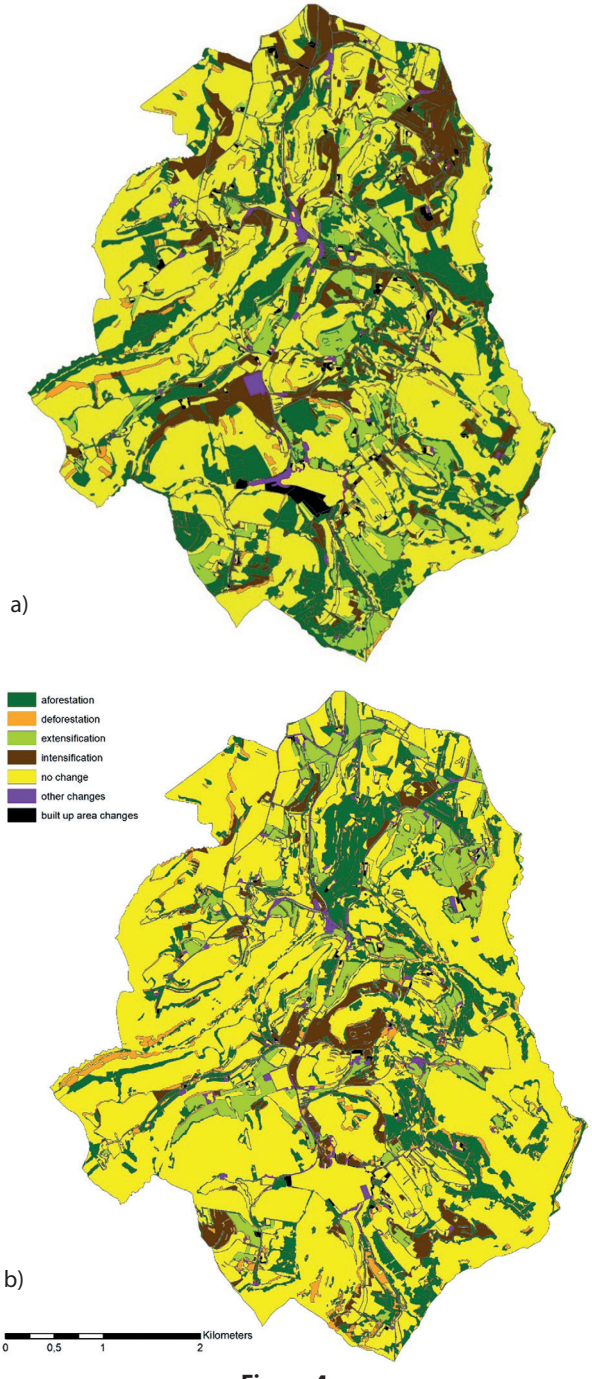


Figure 4
LC conversion in the first period (a) and second period (b)

of abandoning hamlets and releasing the surrounding agricultural land. These are middle-aged and younger people who moved to Hrušov from other parts of Slovakia (and even Czechia) with the aim of permanent stay and farming. These are not weekend and holiday vacationers or cottagers, whom we know from other regions of dispersed settlements in Slovakia. In addition to the restoration and maintenance of the residential and farm buildings, these new permanent residents of Hrušov are engaged in cultivation of traditional crops and raising livestock, introduction of permaculture, revitalisation of traditional crafts, or provision of accommodation and other services. They also contribute to the study of local conditions (environment) and participate in their professional interpretation and promotion (see e.g. Brada et al. 2014, Bendík (ed.) 2019).

Perspectives of dispersed settlement in Hrušov in the light of the institutional framework

Despite numerous factors limiting the continued existence of dispersed settlements, there are several conventions, strategies, programmes, schemes, instruments, and measures that directly or indirectly support its continued existence and sustainable development, at the international, national, regional and local levels. This is true not only in the national scale, but also in application to a specific municipality (village Hrušov).

The individual international documents that the Slovak Republic has undertaken to comply with form a framework, an argumentative basis and, to a limited extent, supportive (financial and other) mechanisms in favour of maintaining the dispersed settlement and the surrounding rural cultural landscape. They concern strategic, institutional, environmental, economic, social and, last but not least, cultural issues. Of the several relevant ones, we mention at least some of them.

At the UN ECE level, it is The Framework Convention on the Protection and Sustainable Development of the Carpathians (Carpathian Convention, 2003), at the European level Landscape Convention of the European Council (2000) and at the level of the European Union the Common Agriculture Policy 2014-2020 (European Commision (2013). Equally important and logically much more concrete and targeted are the relevant documents of the domestic provenance: at the level of the Slovak Republic - Programové vyhlásenie Vlády Slovenskej republiky (Program Declaration of the Slovak Government for Years 2020 - 2024), at the regional level it is the Územný plán VÚC BBK (Territorial Plan of the Banská Bystrica Region (last updated in 2014), Program hospodárskeho a sociálneho rozvoja BBSK 2015-2023 (Programme of the Economic and Social Development of the Banská Bystrica Region 2015 - 2023), and Program rozvoja obce Hrušov na roky 2015-2024 (Plan of the Local Development of Hrušov for 2015 - 2024) at the local level. All the mentioned documents contain parts which are important from the point of view of

further existence and sustainable development of the municipality of Hrušov and dispersed settlements on its territory.

The Framework Convention on the Protection and Sustainable Development of the Carpathians or the Carpathian Convention (2003) pursues a comprehensive policy and cooperation in the protection and sustainable development of the Carpathians. Several parts of this Convention are relevant for Hrušov village too. E.g. Article 5/1 *Spatial planning* declares: "The Parties shall pursue policies of spatial planning aimed at the protection and sustainable development..., which shall take into account the specific ecological and socio-economic conditions in the Carpathians and their mountain ecosystems, and provide benefits to the local people. Article 7/1 *Sustainable agriculture and forestry* demands maintaining the management of land traditionally cultivated in a sustainable manner... taking into account the need of the protection of mountain ecosystems and landscapes, the importance of biological diversity, and the specific conditions of mountains as less favoured areas. And Article 11 - *Cultural heritage and traditional knowledge* recommends policies aiming at preservation and promotion of the cultural heritage and the traditional knowledge of the local people, crafting and marketing of local goods, arts, and handicrafts. To preserve the traditional architecture, land-use patterns, local breeds of domestic animals and cultivated plant varieties, and sustainable use of wild plants.

Another important international document, party of which is the Slovak Republic, is the European Landscape Convention of the Council of Europe in 2000. Several parts of this Convention are also important for Hrušov. Article 5 demands inter alia to recognise landscapes by the law as an essential component of people's surroundings, expression of the diversity of their shared cultural and natural heritage, and the foundations of their identity, to establish and implement landscape policies aimed at landscape protection, management and planning through the adoption of the specific measures..., to establish procedures for the participation of the general public, local and regional authorities, and other parties with an interest in the definition and implementation of the landscape policies and to integrate landscape into its regional and town planning policies and in its cultural, environmental, agricultural, social and economic policies, as well as in any other policies with possible direct or indirect impact on landscape.

The situation could also be improved by the new EU Common Agricultural Policy (for 2021 – 2027), which calls for further "greening" and diversification of agriculture and the rural landscape in the EU member states (Matthews 2018) as well as by the new Slovak government, which in its Programme Declaration for 2020 - 2024 (*Programové vyhlásnie vlády SR, 2020*) explicitly states that it will improve the conditions of livestock breeding, and will legislatively support family forms of business, small, young and beginning farmers, through a system of microloans. It will support the active economic use of the foothills and mountain

landscape with a special focus on the dispersed settlement areas, restoration and preservation of traditional farm management systems in the landscape with dispersed settlements (lazy, kopanice, štále), development of agrotourism and preservation of the original Slovak gene pool in agricultural production. As part of increasing self-sufficiency, it will pay special attention to crops typical for our soils and climatic conditions. It will provide support for sectors that are potential sources of employment and value addition such as livestock production, special crop production, fruit growing, vegetable growing, viticulture, beekeeping and other, in order to maximize processing of raw materials from domestic production.

The issues discussed in this paper also relate to regulations of the Územný plán VÚC BBK (Territorial Plan of the Banská Bystrica Region update from 2014), which requires, among other things, ensuring the permanent landscape protection in accordance with the European Landscape Convention aimed at the preservation and maintenance of significant or characteristic features of landscape resulting from its historical heritage and natural layout or human activity.

Similarly, Program hospodárskeho a sociálneho rozvoja BBSK (Programme of the Economic and Social Development of the Banská Bystrica Region 2015 – 2023, 2015) states that more attention needs to be paid to regional and rural policy in order to increase the attractiveness of rural life and stop the growth of negative factors and especialy to improve the quality of life. The aim of the programme's measures should be to create a multifunctional rural environment that affects all areas of rural life - not only economic, but also social, cultural, environmental and institutional.

Since 2000 until now Hrušov has been a member of three micro-regional associations. Since 2015, it is the *Hontianske Poiplie Civic Association*, consisting of 30 municipalities. Hrušov has the ambition to play a leading role within this voluntary association of the municipalities of the micro-region.

The municipality of Hrušov does not currently have an official territorial plan or programme of economic and social development. They are partially replaced by the Community Development Programme (CDP) for 2015 - 2024. According to this programme, the village has preserved its distinctive character to this day with traditional folk elements of housing, culture and clothing. In addition to growing the common crops, the inhabitants of Hrušov are engaged in cattle, sheep breeding and viticulture. According to the CDP, the municipality of Hrušov has a real potential primarily for the development of rural tourism, including agrotourism (which is provided by the entrepreneurs in agricultural production and which serves as an additional financial source to maintain or expand the main business programme). These activities are directly connected with natural landscape and rural environment; they contribute to the overall development of the village especially by enabling the use of the rural environment (dispersed settlements, viticulture and wine cellars), create new jobs and help the renewal and development of the village.

As far as tourism is concerned, the starting point for the village of Hrušov is, according to CDP, to preserve the tradition, customs and way of life of Hrušov. The international *event* of traditional culture, the *Hontianska paráda* festival, offers people an insight into the life of this unusual village. The village provides specific tourism products to visitors throughout the year. These include private accommodation in the countryside and in the village with the accompanying adventure activities. The product of rural tourism is based on domestic resources and is implemented by the inhabitants of the village. The "Regional HONT brand" product also helps to make the countryside visible.

According to the SWOT analysis, based on an active participation of local citizens, the main development opportunities of the municipality are as follows: rural tourism, cultural tourism, natural (bio)agriculture, development of handicrafts within municipality, information office - information service, the municipality as a positive example in various areas and a leader within the micro-region, the possibility of rebuilding farmsteads for tourism, restoration of original eco-agrosystems for the specific eco-production, regional brand HONT and Ecomuseum and other regional brands. These findings correspond to the results of field research conducted through structured interviews (Huba and Ira 2020).

The main strategic goal of CDP in Hrušov is to ensure a balanced and sustainable development of this unique village aimed at preservation of folk traditions and improvement of the economic and social conditions of life in the municipality. The basis for the development of the municipality will be the evaluation of its internal potential with the use of external additional resources. The relevant proposed projects for 2015 – 2024 are: reconstruction of folk buildings in the village and construction of museums with different focuses, completion of the list of monuments (buildings and areas protected by the municipality) and support to the declared protected buildings, landscaping - preserving the traditional cultural landscape, construction of buildings for storage and presentation of historical farm equipment, collection and purchase of museum objects, construction of facilities for processing fruit, vegetable, support of a common point of sale for local products, support of young farmers and family farms, implementation of pilot and cyclical events (ethnography, traditional agriculture, technology, crafts, sports, etc.), mapping of regional and traditional varieties, their use and presentation, establishment of the gene pool orchards, care for the existing gene pool, material and technical equipment for groups to maintain the folklore character of the village, implementation of anti-erosion measures - restoration of plantations, especially along roads, implementation of anti-flood measures - water retention in the landscape (transverse and longitudinal modifications of ditches, seepage pits, small water reservoirs, road modifications, restoration of wells - backup sources, irrigation, etc.).

DISCUSSION

During 1991 – 2011, the population decrease (62%) in hamlets of Hrušov was higher compared to average 52% decrease in five surrounding villages with dispersed settlement in the Krupinská planina plain (Štatistický lexikón obcí SR 1992, 2011, own calculations). The probable cause is the double residency model in Hrušov. Unlike most of the hamlet villages, where a hamlet serves as an exclusive residential place, Hrušov hamlets were not exclusive residency for many locals. Thus, a double residency model allowed them migration between the core part and the hamlet, if it was convenient to them. Similar depopulation model – migration from hamlets to the core part – was reported in Montefrio in southern Spain. The number of the population living in a dispersed settlement reached its peak in the 1940s – 1950s when it significantly exceeded the number of the population in the core part, and since then it has been continuously declining (Amate et al. 2016).

The second half of the 20th century and the beginning of the 21st century in East-Central Europe were characterized by dynamic socio-economic changes which also left traces in the landscape (Demek et al. 2012, Haase et al. 2007, Kanianska et al. 2014). In addition to these regional driving forces of landscape changes, the local specificities of Hrušov were of crucial importance – a dispersed settlement by its genesis different from most of the dispersed settlement types in the near and distant surroundings, position on the ethnical Slovak-Hungarian divide, marginal position towards Czechoslovak, and later Slovak central regions, and last but not least, the confessional exclusivity of the local population towards the surrounding villages. These factors underlined conservatism of the local people which, besides some negatives, also had significant positive consequences reflected in their self-confidence, independence, activism and a high level of self-sufficiency in processing of food and articles for everyday life.

In 1950, hamlets were the focal points of agricultural production, most of the farm animals were housed here (Brada et al. 2014). The appearance and functioning of the agricultural landscape between 1950 and 1979 changed only very little. Here too, the mechanization and chemicalization of agriculture has been applied, increasing its efficiency but not to the extent as it was in regions with collectivized farms (Brada et al. 2014). However, this has not fundamentally affected the agricultural landscape pattern. It can be assumed that most of the significant changes in LC during the 1st period (1950 – 1986) concentrated into a relatively short 7-year final period after 1979 when the collectivization process began. The process of migration from hamlets to the core began already before 1980, while the total population of the municipality did not decrease (Matrika Hrušov). New job opportunities and a more comfortable life caused the emigration of many young people to the cities, and the relationship between people and the land has been torn down. In 1989, shortly after 1986 which is a turning point between the monitored

periods, another turning point occurred in the political and economic development of former Czechoslovakia – the end of socialism, advent of democracy and market economy with all positives and shortcomings, and establishment of the independent Slovak Republic in 1992. Socialist collectivization model ended; part of the land was given back to the original owners. A new farming cooperative started on part of the agricultural land in 2001. New farmers were facing the problems of fragmented and unclear land ownership which were not solved during the socialist era. On the other hand, cultivation efficiency has increased.

For Hrušov, as well as for other municipalities in Slovakia with dispersed settlements, it is very important whether the declarations can be adopted and implemented, and especially specific tools and measures to preserve values and alleviate the existing restrictions and disadvantages associated with life and by farming in the landscape with dispersed settlement. Several measures promised by the new Slovak government for the preservation of the rural landscape, cultivation of traditional crops, breeding of domestic animals and sale of food from the yard seem to be challenging. For the first time in history, the Slovak government has explicitly (even repeatedly) committed itself to support the renewal and preservation of the traditional dispersed settlement management systems. Similar measures have been introduced in the past by the governments of several European countries where similar settlements occur (see, e.g. Leitmeir, 1983). The bill, which regulated the conditions of such support for Slovakia, was submitted to a group of deputies as early as 2015 (and repeatedly since then), but it never received enough support. The explanatory memorandum to the bill states, among other things, that dispersed settlements is one of the distinctive manifestations of socio-economic activity, conditioned by specific natural and historical environments. In many EU countries, inhabitants of such remote areas are financially favoured, e.g. there is a possibility for them to obtain the governmental subsidies (e.g. Finland, Austria and Romania). In Greece, families with children living in mountainous and disadvantaged areas are supported by annual financial support. In Sweden, there are legal regulations for sparsely populated areas, the aim of which is to create equal economic conditions for all municipalities and regions in the country (NR SR, Parlamentná tlač 1532, 2015). For more on the topic of support for farmers in disadvantaged areas in various European countries, see e.g. Parliamentary Institute of the National Council of the Slovak Republic (2018).

CONCLUSION

Unlike most dispersed settlements regions in Europe and Slovakia, the character of the dispersed settlement in Hrušov has been generated historically during a relatively short period of time which was one of the reasons why a specific type of a scattered settlement arose there. The local specificities lie at the three areas: set-

tlement-demographic (double-residency model), political-economic (delayed and relatively short-term collectivization of agricultural production) and finally geoecological (high proportion of plains in the highest altitudes of the area which have the most suitable conditions for agriculture cultivation). Concurrence of these specificities clarifies that the obtained results differ in some aspects from the results obtained in other areas with dispersed settlement in Slovakia.

The transformation of local conditions in Hrušov and in the cultural landscape with dispersed settlement through the integration into systems of new political, socio-economic and cultural contexts is underlying the question of how to adapt to these new conditions. Our research showed that some people (mostly local leaders) are able to cope with the new conditions, that is, to learn the new ideas, skills, technologies or procedures perceived necessary to function within the new system in order not to remain marginalised.

The study contributes to the dissemination of knowledge of the dispersed settlement landscape which is a traditional and important part of the settlement system in many countries and is one of the types of a historical cultural landscape.

The results of the study can serve as inspiration for local plans for social and economic development as well as for planning the sustainable development of a region with a specific dispersed settlement.

Acknowledgement

This paper was prepared within the project of the Scientific Grant Agency of the Ministry of Education, science, research and sport of the Slovak Republic and the Slovak Academy of Sciences VEGA No. 2/0013/18 Evaluation of the transformation of natural and socio-cultural diversity of the cultural landscape in Slovakia (on example of selected areas).

REFERENCES

ALMEDAL, S. (1983). Changes in Rural Settlement in Northern Norway in the 1970´s. *Norther and Mountain Villages under Pressure of Change*. Oulu: IGU.

AMATE, J. I., VILLA, I., JIMENÉZ, F., DE MOLINA, M. G. (2016). The rise and fall of the cortijo system: scattered rural settlements and the colonization of land in Spain's Mediterranean mountains since 1581. *Journal of Historical Geography*, 54, 63-75.

BELČÁKOVÁ, I., PŠENÁKOVÁ, Z. (2013). Špecifiká a krajinné podmienky rozptýleného osídlenia na Slovensku - príklad prírodného, historického a kultúrneho dedičstva. In Merunková, I. ed., *Krajina v proměnách času.* 18. kolokvium kateder záhradní a krajinářské tvorby s mezinárodní účastí 26. 9. 2013 v Praze. Praha: Česká zemědelská univerzita, pp.32-37.

BENDÍK, P. ed. (2019). *Hrušov Obec tradičnej ľudovej kultúry* (A village of traditional folk culture). Hrušov: Obec Hrušov.

BIRCH, B. P. (1967). The Measurement of Dispersed patterns of Settlement. *Tijdschrift voor Economische en Sociale Geografie,* 58, 68-75.

BOTÍK, J. (1980). Dvojrezidenčnosť ako dôsledok lazového osídlenia. *Slovenský národopis*, 28, 1, 78-83.

BRADA, P., ZRNÍKOVÁ, K., BRLOŠ, J. (2014). *Roľníctvo v Hrušove*. Hrušov: Obecný úrad.

ČERNE, A. (2004). Dispersed and decentralised settlement system. *Dela*, 21, 83-95.

DEFFONTAINES, P. (1931). Un type de peuplement dispersé en Slovaquie. In: Príspevky k praveku, dejinám a národopisu Slovenska. *Sborník archeologického a národopisného odboru Slovenského vlastivedného múzea za rok 1924 – 1931*. Bratislava: Nákladom spoločnosti Slovenského vlastivedného múzea, pp. 90 – 96.

DEMEK, J., MACKOVČIN, P., SLAVÍK, P. (2012). Spatial and temporal trends in land-use changes of Central European landscapes in the last 170 years: a case study from the south-eastern part of the Czech Republic. *Moravian Geographical Reports*, 20, 3, 2–22.

DÉRY, S., LEIMGRUBER, W., ZSILINCSAR, W. (2012). Understanding Marginality: Recent Insights from a Geographical Perspective. *Hrvatski Geografski Glasnik*, 74, 1, 5 – 18.

DOVRING, F., DOVRING, K. (1965). Agricultural Settlement and the Layout of Land. In: *Land and Labor in Europe in the Twentieth Century*. Studies in Social Life. Dordrecht: Springer.

EHLERS, E. (1974). Recent Trends and Problems of Agricultural Colonization in Boreal Forest Lands. In Ironside, R.D., ed., *Frontier Settlement*. Univ. of Alberta, pp. 60 - 78.

EPA - Environmental Protection Agency Ireland (2008). *State of Environment. Report 2008*. Chapter Land use, (pp.158 – 171) [accessed on 9 October 2019]. Retrieved from:https:// www.epa.ie/pubs/ reports/indicators/ irlenv/43366%20EPA%20report%20chap%20111.pdf.

European Commision (2013*). Agricultural Policy Perspectives Brief N°5*/ December 2013*. Overview of CAP Reform 2014-2020 [accessed on 18. March 2020]. Retrieved from: https://ec.europa.eu/info/food-farming-fisheries/key-policies/common-agricultural-policy_en

European Landscape Convention of the Council of Europe (2000) [accessed on 17 March 2020]. Retrieved from: https://www.coe.int/en/web/landscape.

FEKETE, Š. (1947). Typy vidieckeho osídlenia na Slovensku. *Spisy Slovenskej zemepisnej spoločnosti, 1, 7-17.*

FERANEC, J., ŠÚRI, M., CEBECAUER, T., OŤAHEĽ, J. (2002). Methodological aspects of landscape changes detection and analysis in Slovakia applying the CORINE land cover databases. *Geografický časopis*, 54, 3, 271-288.

FLETCHER, R. (2019). Trajectories to Low-Density Settlements Past and Present: Paradox and Outcomes. *Frontiers in Digital Humanities* [accessed on 20 April 2020]. Retrieved from: https//:doi.org/10.3389/fdigh.2019.00014.

Framework Convention on the Protection and Sustainable Development of the Carpathians (Carpathian Convention, 2003), [accessed on 10. March 2020]. Retrieved from:http://www.carpathianconvention.org/

FROLEC,V. (1980). „Kolibarská" sídla ve východní části Balkánskeho polostrova. *Slovenský národopis*, 28, 1, 64-67.

Google Earth Pro. 8.7. 2016, *Hrušov*, Slovakia, 48°09 '15.01"N, 19°05 '28.58"E, eye altitude 7000 m.

HAASE, D., WALZ, U., NEUBERT, M., ROSENBERG, M. (2007). Changes to Central European landscapes – Analysing historical maps to approach current environmental issues, examples from Saxony, Central Germany. *Land Use Policy*, 24, 1, 248-263

HALÁS, M. (2008). Priestorová polarizácia spoločnosti s detailným pohľadom na periférne regióny Slovenska. *Sociologický časopis/Czech Sociological Review*, 44, 2, 349-369.

HALÁS M., HURBÁNEK P. (2008). Identifikácia a klasifikácia periférnych regiónov (pokus o syntézu). In Džupinová E., Halás M., Horňák M., Hurbánek P., Káčerová M., Michniak D., Ondoš S., Rochovská A., eds., *Periférnosť a priestorová polarizácia na území Slovenska*. Bratislava: Geo-grafika, pp.109-136.

HANUŠIN, J., LACIKA, J. (2017). Vybrané environmentálne súvislosti zmien historickej lazníckej krajiny (na príklade obce Hrušov, okres Veľký Krtíš). *Geografický časopis*, 70,1, 57-77.

HANUŠIN, J., LACIKA, J. (2018). Transformácia historickej kultúrnej krajiny s rozptýleným osídlením (na príklade obce Hrušov, okres Veľký Krtíš). In Ira,V., Hanušin, J., eds., *Geographia Slovaca* 33, Premeny a ochrana historickej kultúrnej krajiny na Slovensku Bratislava: Geografický ústav SAV, pp. 85-120.

Historická ortofotomapa © GEODIS SLOVAKIA, s.r.o., Historické LMS © Topografický ústav Banská Bystrica, Ortofotomapa © EUROSENSE, s.r.o. a GEODIS SLOVAKIA, s.r.o., mapové podklady © Topografický ústav Banská Bystrica, © TU Zvolen.

HOČEVAR, M. (2012). Dispersed settlement in detached houses: Attitudes over the residential space consumption in Slovenia. *Sociologija,* 54, 1, 123-152.

HOFFMANN, R. C. (2014). *An Environmental History of Medieval Europe*. Cambridge: University Press.

HORVÁTH, P. (1980). Historický prehľad vzniku a rozvoja chotárnych sídiel v slovenskej časti Karpát. *Slovenský národopis*, 28, 1, 8-18.

HROMÁDKA, J. (1943). *Všeobecný zemepis Slovenska*, *Slovenská vlastiveda I*. Bratislava: SAVU.

HUBA, M. (1986). *Krajinná syntéza oblastí kopaničiarskeho osídlenia na príklade Javorníkov*. PhD. thesis. Bratislava: Geografický ústav SAV.

HUBA, M. (1989). O niektorých otázkach genézy a súčasného stavu kopaničiarskeho osídlenia na území Slovenskej socialistickej republiky. *Geografický časopis*, 41, 2, 138-155.

HUBA, M. (1990). O perspektívach kopaničiarskeho osídlenia a kopaničiarskej krajiny na území Slovenskej republiky. *Geografický časopis,* 42, 2, 113-130.

HUBA, M. (1997). Kopaničiarske osídlenie, životné prostredie a trvalo udržateľný spôsob existencie. *Životné prostredie,* 31, 2, 61-66.

HUBA, M., IRA, V. (2020). *Vyhodnotenie riadených rozhovorov s mienkotvornými osobnosťami v obci Hrušov*. Manuscript, Bratislava: Geografický ústav SAV.

HUDSON, J. C. (1969). A location theory for rural settlement. *Annals of the Association of American Geographers*, 59, 2, 365 - 381.

CHIFFELE, F. (1983). Swiss Agricultural Policy in Mountainous Areas. In *Norther and Mountain Villages under Pressure of Change*. Oulu: IGU.

CHOTEK, K. (1906). Cerovo. Národopisní studie. *Národopisný věstník československý* č. 1.

IRA, V. (2019). Impact of Rural Restructuring on the Time-Space Behavioural Patterns in a Marginal Area. In Leimgruber, W., Chang, C., eds., *Rural Areas Between Regional Needs and Global Challenges, Perspectives on Geographical Marginality* 4. Springer Nature Switzerland AG, pp. 17-29.

IRA V., MADAJOVÁ M., CHRENKA B. AND FACUNOVÁ, R. (2014). Časovo-priestorový kontext činností človeka: prípadová štúdia obyvateľov marginálneho horského územia. *Geografický časopis*, 66, 4, 341-362.

JANŠÁK, Š. (1929). Príspevok k štúdiu osídlenia Slovenska. Obce a kopanice. *Sborník muzeálnej slovenskej spoločnosti,* 23, 3-4, 93-111.

KAMASOVÁ, M., BENDÍK, P. (1996). *Hrušov. Z histórie a súčasnosti obce*. Hrušov: Obecný úrad.

KANIANSKA, R., KIZEKOVÁ, M., NOVÁČEK, J., ZEMAN, M. (2014). Land-use and land-cover changes in rural areas during different political systems: A case study of Slovakia from 1782 to 2006. *Land Use Policy,* 36, 554– 566.

KOLEKTÍV. (1990). ÚPN – Z. *Hrušov, laznícke osídlenie*. Sprievodná správa. Banská Bystrica: Stavoprojekt, š. p. Ateliér 4.

KOVÁCS, A. D., FARKAS, J. Z. (2011). Problems and development concepts for scattered farms in Hungary – a case study from the "Kiskunság region". *Hrvatski geografski glasnik*, 73, 2, 165 – 177.

LAKE, J., EDWARD, B., BANNISTER, N. (2014). Farmsteads and Landscapes in Kent. *Archaeologia Cantiana,* 134, 105 – 139.

LAPIN, M., FAŠKO, P., MELO, M., ŠŤASTNÝ, P., TOMLAIN, J. (2002). Klimatické oblasti. Mapa 1: 200 000. *Atlas krajiny Slovenskej republiky.* Bratislava: Ministerstvo životného prostredia Slovenskej republiky, Esprit, s.r.o.

LAUKO, V. (1985). Vývoj a transformácia kopaničiarskeho osídlenia Myjavskej pahorkatiny. *Acta Facultatis Rerum Naturalium Universitalis Comenianae, Geographica*, 25, 35-52.

LEIMGRUBER W. (1994). Marginality and marginal regions: Problems of definition. In Chang C.-Y. D, Jou S.-C, Lu Y.-Y. eds., *Marginality and development issues in marginal regions*. Taipei: National Taiwan University, pp.1–18.

LEIMGRUBER W. (2004). *Between global and local. Marginality and marginal regions in the context of globalization and deregulation*. Aldershot: Ashgate.

LEIMGRUBER W. (2007). Geographical Marginality – past and new challenges. In Jones, G., Leimgruber, W., Nel, E. eds., *Issues in Geographical Marginality*. Papers presented during the Commission Meetings 2001-2004, General and theoretical aspect, CD-Rom. Grahamstown: Rhodes University South Africa, pp.2-11.

LEITMEIR, A. (1983). Urbanisation as Process of Population and Settlement Development in Rural Areas of the Alps. In: *Norther and Mountain Villages under Pressure of Change*. Oulu: IGU.

LUKNIŠ, M. (1950). Detvianska kolonizácia v Gemeri. *Zemepisný zborník*, II., 1 - 2, 1-7.

LUKNIŠ, M. (1980). Kopaničiarske osídlenie v Gemeri. *Slovenský národopis*, 28, 1, 41-50.

MAGLOCKÝ, Š. (2002). Potenciálna prirodzená vegetácia. Mapa 1: 500 000. *Atlas krajiny Slovenskej republiky.* Bratislava: Ministerstvo životného prostredia Slovenskej republiky, Esprit, s.r.o.

MAJORAL, R. (1977). The Consequences of depopulation in the Western Pyrenees of Catalonia. *Iberian Studies,* VI, 1, 24 – 33.

MARTINKA, J. (1927). Morfologické typy slovenských osád. *Sborník muzeálnej slovenskej spoločnosti*, 21, 1, 48-57.

MATTHEWS, A. (2018). The CAP in the 2021–2027 MFF Negotiations. *Intereconomics* 53, 306–311.

Matrika obce Hrušov. (Hrušov Parish register, handwriting). Hrušov: Obecný úrad.

MATSUMOTO, T. (1950). Structure of dispersed settlement and its history the Nagaoka plateau, Kochi prefecture. *Japanese Journal of Human Geography*, 2, 1, 24-38.

MAZÚR, E., LUKNIŠ, M. (1978). Regionálne geomorfologické členenie SSR. *Geografický časopis*, 30, 2, 101-125.

MEDVECKÝ, A. (1905). *Detva*. Ružomberok: Kníhtlačiareň Karla Salvu.

MÉSÁROŠ, J. (1966). K dejinám kopaníc a kopaničiarskeho osídlenia na Slovensku. *Vlastivedný časopis (Pamiatky a múzeá),* 15, 4, 173-179.

MIKUŠ, R., MÁLIKOVÁ, L., LAUKO, V. (2016). An introductory study of perceptual marginality in Slovakia. *Bulletin of Geography, Socio-economic Series*, 34, 47–62.

NAHÁLKA, P. a kol. (1966). *Výskum rozptýleného osídlenia na Slovensku*. Bratislava: VÚPS SF SVŠT.

Národný archív SR. *Sčítanie ľudu k 1. marcu 1950*. Zložka Hrušov okres Šahy.

NR SR, Parlamentná tlač 1532, (2015). *Návrh skupiny poslancov Národnej rady Slovenskej republiky na vydanie zákona o podpore zachovania územia s rozptýleným osídlením a jeho obyvateľov (laznícky zákon) a o zmene a doplnení niektorých zákonov.* [accessed on 24 April 2020]. Retrieved from: https://www.nrsr.sk/web/Default.aspx?sid=zakony/zakon& Master ID =5471.

OKAMOTO, K. (1955). Dispersed settlement and its relation to the surface configuration on the deltaic plain of Kanto. *Japanese Journal of Human Geography*, 7, 3, 182-194.

OMASTA, Š. (2010). K niektorým otázkam vyčleňovania území s rozptýleným osídlením: príklad Myjavskej kopaničiarskej podoblasti. *Geographia Cassoviensis*, 4, 2, 141-146.

OMASTA, Š. (2011). Rozptýlené vidiecke osídlenie – socioekonomické a historické aspekty. *Životné prostredie,* 45, 1, 43-47.

OŤAHEĽ, J., FERANEC, J., KOPECKÁ, M., FALŤAN, V. (2017). Modifikácia metódy CORINE Land Cover pre identifikáciu a zaznamenávanie tried krajinnej pokrývky v mierke 1:10 000 na báze príkladových štúdií z územia Slovenska. *Geografický časopis* 69, 3, 189-224.

OWEN, S., SARLOV-HERLIN, I. (2009). A sustainable development framework for a landscape of dispersed historic settlement. *Landscape research*, 34, 1, 33-54.

PELC, S. (2017). Marginality and Marginalization. In Chand, R., Nel, E., Pelc, S. eds., *Societies, Social Inequalities and Marginalization. Marginal Regions in the 21st Century.* Springer Nature, pp.13-28

PETROVIČ, F. (2006 a). Vzťah rozptýleného osídlenia k morfometricko-polohovým vlastnostiam reliéfu. *Acta Environmentalica Universitatis Comenianae (Bratislava),* 14, 1, 105–113.

PETROVIČ, F. (2006 b). The changes of the landscape with dispersed settlement. *Ekológia (Bratislava)*. 25, (Suppl. 1), 201–211.

POLÁČKOVÁ L. (2010). Parciálne prístupy k štúdiu marginality. *Acta Geographica Universitatis Comenianae*, 54, 1, 157-169.

PRELOVSKÁ, D. (1987). Kopanice v Nitrianskej stolici v polovici 18. storočia. *Agrikultúra*, 21, 41-65.

PRIEČKO, M. (2003). Spoločensko-politické zmeny po roku 1948 a ich dopad na spôsob života v kysuckých vrchárskych osadách. *Národopisný zborník,* 14, 135-151.

PRIEČKO, M. (2015). *Socioekonomické perspektívy rozptýleného osídlenia na Slovensku (komparácia lokalít Málinec, Nesluša a Valaská Belá)*. Trnava: Univerzita sv. Cyrila a Metoda.

Program hospodárskeho a sociálneho rozvoja BBSK 2015-2023 (2015). (Programme of the Economic and Social Development of the Banská Bystrica Region). [accessed on 26 March 2020]. Retrieved from: https://www.bbsk.sk/eSlu%C5%BEby/Region%C3%A1lnyrozvoj/Programhospod%C3%A1rskehoasoci%C3%A1lnehorozvojaBBSK2015-2023.aspx.

Program rozvoja obce Hrušov na roky 2015-2024. (Development Programme of Hrušov Village for Years 2015 – 2024). [accessed on 17 March 2020]. Retrieved from: http://www.hrusov.sk/download_file_f.php?id=667070.

Programové vyhlásenie Vlády Slovenskej republiky na r. 2020 – 2024 (Programme Declaration of the Slovak Government for Years 2020 - 2024). [accessed on 13 May 2020]. Retrieved from: http://mepoforum.sk/wp-content/uploads/2020/04/Vl%C3%A1da-SR-Programove-Vyhlasenie-2020-2024.pdf.

RIKKINEN, K. (1981). The Lapp Villages of the Northern Kola Peninsula in 1980´s. *Fennia*, 159, I, 201 - 207.

ROBERTS, B. K., (1996). *Landscapes of settlement. Prehistory to the present*. London, New York: Routlege.

ROSTANKOWSKI , P. (1982). Die Entwicklung osteuropäischer ländlicher Siedlungen und speziell der Chutor-Siedlungen. *Osteuropastudien der Hochschulen des Landes Hessen*. Berlin: Duncker & Humblot.

SCHWARTZ, G. (1989). *Algemeine Siedlungsgeographie. Teil 1. Die ländliche Siedlungen Die zwischen Land und Stadt stehenden Siedlungen*. Berlin, New York: Walter de Gruyter.

SIEFERLE, R. P. (2001). *The Subterranean Forest: Energy Systems and the Industrial Revolution*. Cambridge: The White Horse Press.

SITÁR, E. (1967). Kopaničiarske osídlenie na Slovensku. Niektoré otázky súčasného stavu. *Vlastivedný časopis*, 16, 125 - 135.

SPIŠIAK, P. (1998). Vývoj obyvateľstva v kopaničiarskom osídlení Slovenska. *Geografické informácie,* 5, 18 – 25.

SYMON, J. A. (1959). *Scottish Farming: Past and Present*, Edinburgh.

ŠOLCOVÁ, L. (2008). Vznik a vývoj disperzného osídlenia v Novobanskej štálovej oblasti. *Geographia Cassoviensis*, 2, 1, 171 – 175.

ŠPULEROVÁ, J., ŠTEFUNKOVÁ, D., DOBROVODSKÁ, M. et al. (2017). *Historické štruktúry poľnohospodárskej krajiny Slovenska.* Bratislava: VEDA - vydavateľstvo SAV.

Štatistický lexikón obcí Slovenskej republiky 1992: podľa správného členenia k 30. júnu 1992 a výsledkov sčítánia ľudu, domov a bytov k 3. marcu 1991. Bratislava: ŠEVT.

Štatistický lexikón obcí Slovenskej republiky 2011. [accessed on 11 November 2019]. Retrieved from: https:// slovak.statistics.sk/wps/wcm/connect/cd33d897-7314-41d0-a12ba95e537d7a39/Statisticky_lexikon_obci_Slovenskej_republiky_2011.pdf?MOD= AJPERES&CVID= kRHTpsy&CVID=kRHTpsy&CVID=kRHTpsy&CVID= kRHTpsy.

ŠVECOVÁ, S. (1975). *Kopanicové sídla a dedina. Národopisná štúdia o spoločenských vzťahoch medzi obyvateľmi jednej slovenskej obce*. Praha: Univerzita Karlova.

ŠVECOVÁ, S. (1980). Význam komasácie pre vývoj lazového osídlenia v Honte. *Slovenský národopis*, 28, 1, 35-40.

ŠVECOVÁ, S. (1984). *Lazy v 19. a 20. storočí. (Vývoj roľníckych chotárnych sídiel v oblasti Krupinskej planiny).* Praha: Univerzita Karlova.

ŠVECOVÁ, S. (1988). Lazy a lazníci. In Botík, J. ed., *Hont-tradície ľudovej kultúry*. Martin: Osveta, pp. 392- 425.

TAKAKI, M. (1958). Establishment and function of dispersed settlements. *Japanese Journal of Human Geography,* 10, 4, 268-280.

TINER, T. (1983). Transport Problems of Small Mountain Villages in Nothern Hungary. In *Northern and Mountain Villages under Pressure of Change.* Oulu: IGU.

TROHA, A. (2017). Changing settlement patterns in areas of autochtonous dispersed settlement. *Scientific journal*, 5. Ljubljana: University of Ljubljana, Faculty of Architecture and Faculty of Civil and Geodetic Engineering.

Územný plán Veľkého územného celku Banskobystrický kraj (ÚPN VÚC BBK) - Zmeny a doplnky 2014. [accessed on 10 February 2020]. Retrieved from: https://www.bbsk.sk/Portals/0/01%20Urad%20BBSK/Odd_uzemneho%20planovania/VZN_BBSK_%2027_2014.pdf

VAN DE VELDE, L., VAN EETVELDE, V., ANTROP, M. (2010). A multistep method for historical characterisation of rural settlements in Belgium, results for the province of Antwerp. *Proceedings of the Latvian academy of sciences, ser. A*, 66, 3, 93-104.

VARSÍK, B. (1972). Osídlenie Myjavy a Myjavskej pahorkatiny do začiatku 17. storočia. *Zborník PFUK, Historica* XXIII, 91 - 163.

VEREŠÍK, J. (1974). Vidiecke sídla. *Slovensko – Ľud 3, 1. časť*. Bratislava: Obzor, pp. 463-521.

WOODS, M. (2005). *Rural geography: processes, responses and experiences in rural restructuring*. London: Sage.

ZRNÍKOVÁ, K., HRČKOVÁ, L. (2012). *Výskum historických krajinných štruktúr a ich stupňa zachovalosti pre potreby starostlivosti o krajinu vo vybraných katastrálnych územiach Hriňová a Hrušov.* Krajinno – ekologická štúdia. Zvolen: Technická univerzita vo Zvolene.

ŽUDEL. J. (2010). *Osídlenie Slovenska v neskorom stredoveku.* Bratislava: Veda.

FOLIA GEOGRAPHICA • ISSN 1336-6157 (hard copy) • ISSN 2454-1001 (online)

TECHNICAL REPORT

OPPORTUNITIES AND PROSPECT FOR TOURISM DEVELOPMENT ON RUPAT ISLAND, INDONESIA

Brilliant ASMIT [A], Almasdi SYAHZA [B*], Adanan MAHDUM [C], Riadi RM [D]

Received: August 23, 2020 | Revised: October 26, 2020 | Accepted: November 12, 2020
Paper No. 20-62/2-572

Abstract
The district of North Rupat in Bengkalis Regency, Indonesia, has special characteristics both in terms of its geography and socioeconomics. The Bengkalis Regency has a very strategic position in international trade in terms of its location and access, which can also provide good prospects for tourism development. This study aims to analyze the development of leading tourist areas to accelerate the economic empowerment of the local communities in the North Rupat district. This research used descriptive analysis, SWOT, and multiplier effects to explain the conditions, opportunities, and impacts of tourism development. The result showed that the North Rupat District has potential objects such as three natural tourism, 1 historical tourism, 3 culture tourism, and 3 culinary tourism. The strategy to develop tourism should involve plans to increase the number of tourists, supporting facilities, and income. Tourism development looks promising because the results of the multiplier effect analysis of the direct and indirect factors show a significant impact on tourism income. This study concluded that marine tourism in North Rupat District has a potential for development because it is an archipelago that has a beach with clean sand and many coastal areas. Tourists visiting the North Rupat District thus contribute to the income of the local community.

Key words
Bengkalis, multiplier effect, North Rupat, SWOT analysis, tourism potential.

INTRODUCTION

Tourism is seen as an important sector for economic development (Samimi, Sadeghi and Sadeghi, 2011). It generates 10% of the total income worldwide and accounts for 10.4% of the Gross Domestic Product (GDP) globally (World Travel and Tourism Council, 2018). The development of tourism can create commercial opportunities,

A University of Riau, Kampus Bina Widya Jl. HR. Soebrantas Km. 12.5 Panam, Pekanbaru, Indonesia, brilliant.asmit@staff.unri.ac.id
B* University of Riau, Kampus Bina Widya Jl. HR. Soebrantas Km. 12.5 Panam, Pekanbaru, Indonesia, almasdi.syahza@lecturer.unri.ac.id (corresponding author)
C University of Riau, Kampus Bina Widya Jl. HR. Soebrantas Km. 12.5 Panam, Pekanbaru, Indonesia, mahdum.adanan@lecturer.unri.ac.id
D University of Riau, Kampus Bina Widya Jl. HR. Soebrantas Km. 12.5 Panam, Pekanbaru, Indonesia, rm.riadi@lecturer.unri.ac.id

attract regional investment, and support other industries in areas that are targeted by the economic sector (Pappas, 2014; Lin and Mao, 2015). Tourism can help encourage poverty alleviation in developing countries – even though they do not have sufficient skills (Garza-Rodriguez, 2019). If developed optimally, a tourist area can produce results through four aspects: preserving the environment, increasing the welfare of the locals, guaranteeing visitor satisfaction, and increasing the integration of community development around the tourist area (Choiriyah, 2017).

The Bengkalis Regency, which has a very strategic geographic and administrative potential, attracts a lot of tourists. In this way, it becomes an extensive prospect supporting the development of tourism. The position of the Bengkalis Regency, near the country's border, is expected to be an international arena as well as accelerate the growth rate of the tourism sector's development. Rupat Island is a tourist destination in the Bengkalis Regency, Riau Province. An increase in the number of visitors allowed by the local government has developed the Rupat Island tourism area. The provincial government has planned to make Rupat Island the center of Malay culture in Southeast Asia in 2020 (Tarmizi, 2016). To support the plan, the government is currently developing a port to facilitate and accelerate access to Rupat Island (Planning and Information Bureau, 2017). However, if the community and local government are not ready and do not support each other, the port will not bring great results and benefits. Therefore, in anticipation of this, the provincial government seeks to prepare local communities and provide information about tourism for them to accept these new changes and to avoid causing *Cultural Lag* (Dangi and Jamal, 2016; Øian et al. 2018). Research related to a comprehensive tourism policy has been conducted by some scientist, involving, Estol et al. (2018) and Connelly and Sam, (2018).

OBJECTIVES

This research was conducted to determine the leading tourism area's development strategy to accelerate the economic empowerment of local communities in the Northern Meeting District on Rupat Island, Bengkalis Regency.

THEORETICAL FRAMEWORK

Tourism can create positive and negative social structures, cultural representations, and relationships among individuals and groups. The complicated relationship between tourism, society, and culture calls for careful strategic funding to ensure that the potential positive social and cultural impacts outweigh the negative impacts (Shahzalal, 2016). The arrival of tourists on Rupat Island might cause socio-cultural problems, such as stereotypes of ethnic groups and nationalities as well as misunderstandings in receiving and interpreting information. As a consequence of such conditions, local governments are required to prepare strategies and plans to im-

prove human resources capable of becoming ready-to-use actors that capture opportunities. If it is not ready early and conceptually, then the development of the Rupat Island Tourism Area will not create many multiplier effects beneficial for the regional economy and local communities.

DATA AND METHODS

This research was completed from April to September 2018 in the Rupat Island, North Rupat District, Bengkalis Regency and conducted by the survey to observing the social life of the community, then recording their behavior. Asking information through basic information by understanding the interaction of the community with various backgrounds, listening to what is planned, and how to solve problems and community expectations. Then the translation of results using the descriptive method (descriptive research). The descriptive study aims to create a systematic, factual, and accurate depiction of events based on facts and the characteristics of populations or specific regions so that they can observe, collect, analyze, and interpret data on the connection between the tourism development potentials of the North Rupat district in Bengkalis Regency.

Primary data were collected through interviews, based on socio-cultural values as the central theme of the study. In-depth interviews were conducted to reveal values, norms, habits, mindset, assumptions, and how individuals play their roles according to their environment, not bound by a list of questions prepared so that interviews are conducted based on the topic of the problem.

Interviews were conducted with 40 informants with different frequency from one informant to another because it depended on the readiness of each informant.

Informants are local community leaders in the tourism area of Rupat Island, Bengkalis Regency who were selected by purposive sampling. Then classified into three groups of informants, such as basic informants, key informants and main informants. The basis for determining base informants and key informants categorized as; base informant is expected to provide clues to the researcher about the existence of other individuals in the community who can provide further information about the data needed by the researcher. Meanwhile, the main informants have specific knowledge compared to other communities. Base informants are people who have knowledge about various sectors in society and have the ability to instruct researchers to other informants who are experts on cultural elements that they want to know, they are called key informants.

The analysis was conducted by first describing the secondary data while the primary data was classified, verified, interpreted, and analyzed to obtain conclusions. The data classification process was carried out in stages based on the answers received from the base and critical informants, followed by a qualitative data interpretation. The discussion was carried out using the comparative method,

by comparing the results of the in-depth interview and field observations using a questionnaire and then made a percentage graph.

The strategy for developing the tourist area of the North Rupat District was analyzed using a SWOT analysis (strengths, weaknesses, opportunities, and threats) that illustrates the strengths, weaknesses, opportunities, and threats as well as the obstacles in a planning process. The results of the SWOT analysis provide conclusions that can reduce emerging weaknesses, increase owned strengths, reduce challenges faced, and enlarge the opportunities that exist to facilitate maximum planning (Vladi, 2014; Sammut-Bonnici and Galea, 2015)

The multiplier effect analysis is used to analyze the economic impact of tourism activities that occur in tourist areas in relation to elements such as income, sales, and labor (Rusu, 2011; Mathouraparsad and Maurin, 2017). The multiplier effect analysis is of two types: 1) Keynesian Local Income Multiplier, which is a value that shows how much tourist spending has an impact on increasing the income of the local community; 2) Ratio Income Multiplier, which is a value that shows how much direct impact tourist spending has. They are formulated as follows:

Keynesian Local Income Multiplier = (D + N + U) / E
Ratio Income Multiplier, Type I = (D + N) / D
Ratio Income Multiplier, Type II = (D + N + U) / D

Where:

E = total tourist expenses (Rupiah)
D = local income is obtained directly from E (Rupiah)
N = local income that is obtained indirectly from E (Rupiah)
U = local income obtained is induced from E (Rupiah)

RESULTS AND DISCUSSION

Tourism potential

The North Rupat District has a strategic position as it is bordered by the Malacca Strait in the west, north, and east, and Rupat District in the south. As most of the North Rupat subdistrict is bordered by the sea, marine tourism shows great potential. Currently, there are three tourist beaches in the North Rupat district: Tanjung Lapin Beach, Pesona Beach, and Aceh Beting Island Beach. In addition, several tours from other sectors, such as cultural, historical, and culinary, which can be developed to add value to the economy and increase the surrounding communities' income are also in place. The potential for tourism development in the North Rupat district, Bengkalis Regency (Table 1) is as follows.

Table 1 Tourism development potential in Rupat Island, North Rupat District, Bengkalis Regency

Tourism potential tourism	Objects
Development of potential nature tourism	Tanjung Lapin Beach, Pesona Beach, and Aceh Beting Island Beach
Development potential of culture tourism	Pesta beach, Ritual Bath Safar, and Rituals of indigenous tribes such as Akit Hatas
Potential development history	Putri Sembilan Tomb Complex
Potential development culinary	Gonggong, Paya acid, and Abuk-Abuk

Beaches are part of coastal areas where coastal areas are transitional areas between terrestrial ecosystems and marine ecosystems that are affected by changes on land and at sea. Development in coastal areas leads to commercial, cultural and entertainment functions, coastal, marine, and small island resources have an important role in development (Darwanto and Stepantoro, 2000).

The beach panorama itself is the natural potential of the beach in the form of scenery. Beach tourism development factors are things that influence the development of coastal tourism where there are potential things that become drivers in the development of coastal tourism. The factor of tourism development is also a complete component of coastal tourism, where the more complete components in tourism affect tourists to return to visit (Oktaviani and Suryana, 2019).

The opportunity to increase tourist visits to Bengkalis Regency in the coming years will be possible because; (1) Bengkalis is located close to the tourism market in the Asia Pacific region; (2) Bengkalis is located close to Singapore as a gateway and a very busy international transportation network; (3) Bengkalis has many visa-free gateways (Hang Nadim Airport, Sikupang Port, Dumai and Pekanbaru); (4) the willingness and determination of the Bengkalis Regency Government to support and develop the tourism sector; (5) advances in information and transportation technology that can be used to support tourism development; and (6) increasing the prosperity of Asia-Pacific countries and Southeast Asia in particular to become a potential market share in providing potential tourists.

Local community response analysis

It is necessary to think of the local communities in the district of North Rupat when considering economic improvement. From the response of the local community (Fig. 1), it is known that there is a need for the development of marine tourism in the area. This is because the North Rupat district is bordered by the sea. A small part of the community has started planting sea corals for nature conservation. The

existence of tourist objects there also needs to be preserved, in addition to preserving the history and tourist objects, it can also improve the people's economy. The next community involvement in increasing tourism potential in North Rupat is existing homestays. There are about nine homestays and one hotel. The daily, social, and economic conditions of these settlements are greatly influenced by tourism. The tourism sector may become one of the cornerstones of the long-term development strategy of the region, with used potential and tourism resources (Bujdoso et al, 2019).

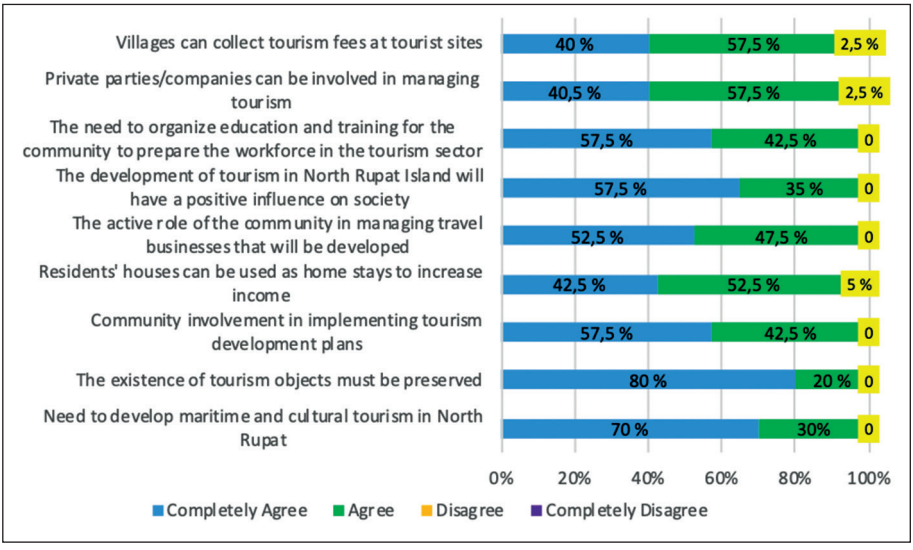


Figure 1
Response of local communities in Rupat island, North Rupat District, Bengkalan Regency

In the tourism development plan, it is necessary to involve the local communities, government, and the private sector. In order to ensure the comfort of the tourists who visit, it is necessary to provide the local community with guidance or training in tourism. Conversely, coaching, or training can change the mindset of people who tend to be wary of tourists. It is expected that tourism development in the North Rupat district can improve the people's economy through industries such as handicrafts, souvenirs, restaurant development, and traditional food development in the future.

Local community empowerment through tourism means the process of building and restoring self-confidence based on environmental conservation so that they are able to build their natural and cultural potential in order to fulfill their needs and continue to sustainable development. Community empowerment is

carried out through community capacity building such as human resource development by providing various forms of education and intensive training, such as accommodation for local transportation management, restaurant management, tour guides, interpretation, foreign language training, building local organizations, waste management, and cleaning, educating the community to understand the conservation of nature and socio-cultural values, education about marketing and promotion. All of these activities become social capital to build community potential which aims to increase the welfare of local communities through tourism management (O'Donnell, 2001).

An example of a case is in Kuta Village, Pujut Subdistrict, Central Lombok Regency, Nusa Tenggara Barat. Kuta Village has potential objects including A'an Beach, Gerupuk Beach, Seger Beach, Batu Payung Beach, Tunak Beach, Are Guling Beach, and Awang Beach. Local community empowerment is carried out in the management of this tourism. This form of empowerment is through the formation of tour guides, training on how to interact with tourists, training in hospitality management, socializing on branding, and arranging tour packages which will then be promoted on social media. The empowerment process directly collaborates with Village-Owned Enterprises, the Tourism Awareness Group (Amir et al, 2020).

DISCUSSION

In the following section, the analysis of the tourism conditions in the North Meeting sub-district will be described, which includes an analysis of internal and external conditions.

Internal conditions analysis

Strengths: 1) A variety of attractions that have great potential and diversity; 2) The amount of community interest in the development of tourist areas to improve the community's economy; 3) The existence of facilities and infrastructure as a basis for tourism; 4) Traditional cultural development in the form of customs, crafts, and food, especially seafood; 5) Hospitality service providers and tourism operators.
Weaknesses: 1) A lack of tourist information centers; 2) Inadequate facilities and infrastructure (gas stations, roads, restaurants, lodging, and network connection); 3) The minimal ability of local communities in the management of travellers (the tour guides are quite expensive); 4) Awareness the community will still low.

External conditions analysis

Opportunities: 1) Potential and high enough tourist interest; 2) There is attention from the provincial government; 3) Rapid development of technology and information; 4) The potential for the development of cooperation with other parties.

Threats: 1) Tourists continue to feel less comfortable; 2) Increased visits of tourists will cause changes in people's lifestyles if not appropriately addressed; 3) An increase in the amount of waste is in line with the increasing number of tourists.

After analyzing the internal and external conditions, the weighting of internal and external factors is calculated to determine the location of the strategic quadrant of development, which is considered urgent. The calculation of factor weights is done by tabulating the internal strategic factor analysis summary (IFAS) score – external strategic factor analysis summary (EFAS). The results of the calculation of factor weights (Tables 2 and Table 3).

Table 2 Internal factor analysis summary

No	Strategic factors	Weight	Rating	Scoring
	Strengths			
1	Having a variety of attractions that also have a diverse potential	0.25	4	1
2	The amount of community interest in the development of tourist areas in order to improve the community's economy	0.15	2	0.3
3	Availability of facilities and infrastructure as a basis for tourism development	0.2	4	0.8
4	Development of traditional culture both in the form of customs, crafts, and food, especially seafood, which can still be done	0.2	4	0.8
5	Hospitality service providers and tour managers	0.2	3	0.6
	Total	**1**		**3.5**
	Weakness			
1	There are no tourist information centers	0.3	4	1.2
2	Inadequate facilities and infrastructure (gas stations, roads, restaurants, lodging, communication lines)	0.3	4	1.2
3	The ability of local communities in handling tourists is still minimal (tour guides are quite expensive)	0.2	4	0.8
4	Community awareness of the environment is still low	0.2	3	0.6
	Total	**1**		**3.8**
	Strength-weakness value -> IFAS: 3.5-3.8 = - 0.3			

Table 3 External factor analysis summary

No	Strategic factors	Weight	Rating	Scoring
	Opportunities			
1	The potential and interest of tourists is quite high	0.3	4	1.2
2	There is attention from the provincial government	0.2	3	0.6
3	The development of technology and information is quite rapid	0.2	2	0.4
4	There is the development of cooperation with other parties	0.3	3	0.9
	Total	**1**		**3.1**
	Threats			
1	Tourists continue to feel uncomfortable	0.4	4	1.6
2	An increase in tourist visits will cause people's lifestyles to change if not addressed properly.	0.3	4	1.2
3	The increase in the amount of waste is directly proportional to the increase in the number of tourists	0.3	4	1.2
	Total	**1**		**4**

The X and Y-axis coordinate system is used to determine the location of a strategy that is considered to have a high priority and needs to urgently be implemented; the axis X is EFAS (Opportunity – Threat) and the Y-axis is IFAS (Strength – Weakness) whose values are stated based on the results of the scoring; the calculation results can be seen in Fig. 2.

Based on the above results, an important strategy to be implemented in the framework of the development of the tourism area in North Rupat subdistrict is located in quadrant III or between the weaknesses and threats, i.e., the Origin of tourist areas, assets (tourist objects and attractions, supporting infrastructure and facilities), revenue (entrance fees and amounts spent).

The strategies taken to survive, or quadrant III, are: a) Building a tourist information center to equip tourists with information about tourism on the island of North Rupat; b) Improving infrastructure and other tourist facilities to support tourism activities; c) Improving community resources through education and training, particularly on tourism; d) Improving community awareness of the importance of environmental and sustainable tourism; e) The synergy between the central government and local government; f) Creating a Tourism Awareness Working Group (Pokjadarwis) that does not exist at this time. The SWOT analysis in Table 4 shows strategies that interact with the internal and external strategic factors for the development of tourist areas in the North Rupat district.

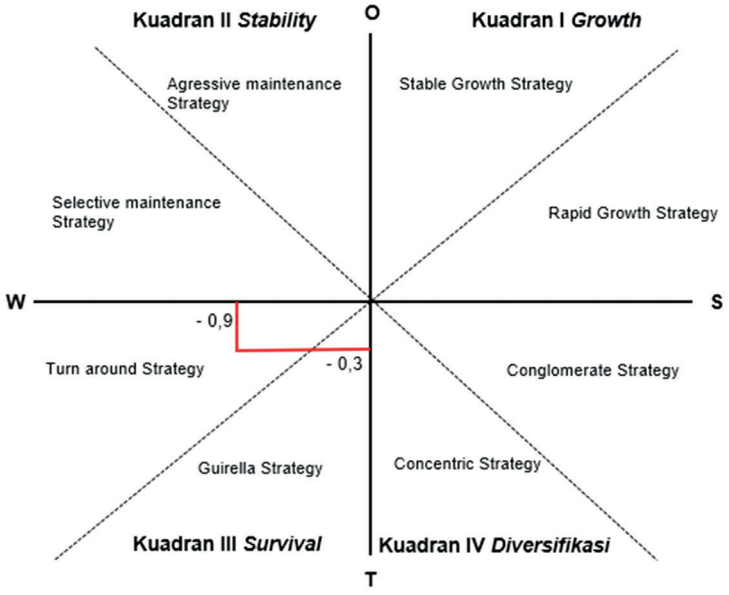


Figure 2
Analysis of the SWOT quadrant

Table 4 *SWOT analysis*

Evaluation external / Evaluation of internal	Strength	Weaknesses
	a) Having a variety of attractions and sights that have the potential to be different b) Total public interest in tourism development to improve the local economy c) The existence of infrastructure as the basis of tourism development d) Development of traditional culture in the form of customs, crafts, and food, especially(*seafood*), which can still be done. e) Friendliness of tourism service providers and managers.	a) There is no tourism information center yet. b) Facilities and infrastructure are inadequate (gas stations, roads, restaurants, lodging, communication lines) c) The ability of local people to handle tourists is still minimal (tour guides are quite expensive) d) Community awareness of the environment is still low

Opportunities	Strategy (S - O)	Strategy (W - O)
a) The potential and interest of tourists is high enough b) Attention from the Provincial government c) Rapid information and technology developments d) The existence of alliances with other parties	a) Develop special interest to travel tourism development such as snorkeling and banana boat. b) Building a network with other objects in the Riau Province in general and Bengkalis Regency and other regencies. c) Collaboration with travel agents both in the province and at the national level d) Increase cooperation between the central and regional governments e) Create a special website for Pulau North Rupat	a) Build a tourist information center to help tourists find information about tourism on the island of North Rupat b) Improve tourism infrastructure and facilities more to support tourism activities c) Increase public resources through education and training, particularly on tourism
Threats	**Strategy (S-T)**	**Strategy (W-T)**
a) There are still travelers who feel uncomfortable b) Increased tourist arrivals will lead to a pattern of community life that can change if not addressed properly. c) The increase in the amount of waste is in line with the increasing number of tourists.	a) Increase and maintain a diversity of contractions b) Maintain the strength of cultural values that still exist c) Increase community understanding of the benefits of social and cultural resilience	a) Increase public awareness of the importance of the environment and sustainable tourism b) The synergy between the central government and regional governments c) Creating a Tourist Awareness Working Group (Pokjadarwis) that does not exist in the current scenario

CONCLUSIONS

After arriving at the results from all respondents (tourists, business units, and the community), information about tourist expenditure and the flow of money was obtained; a number of these funds provide direct benefits, indirect benefits, and continued benefits (induced effect) to the local economy. This economic impact can be measured using a multiplier effect, consist of two types of tests are Keynesian Local Income Multiplier and Ratio Income Multiplier. The following are the results of the calculation of the multiplier effect on tourism in the North Rupat District (Table 5).

Table 5 Travelers' total expenditures in Rupiah

Remarks	D	N	U	E
Total	1.285 million	1.78 million	1,640,000 million	5.145 million

The value of D was obtained from direct use in tourist areas, including lodging, food, and others used in the tourist area. The value of N is obtained from the results of stalls or restaurants as well as purchases of souvenirs managed by other people in the tourist area or near the hotel. U is obtained from the value of crossing using the Roro ship and eating, drinking, or approaching the tourism area. The value of E is obtained from the sum of all expenses incurred by tourists, including the cost of commuting from the tourist area.

Based on the results of Table 6, the value of 0.91 on the Keynesian local income multiplier shows that an increase in 1 unit of business unit income from tourist expenditure will result in an increase in revenue of 0.91 to the total income of local people from tourists. The value of ratio multiplier income type I is 2.39, which indicates that an increase of 1 rupiah in business unit income from the tourist expenditure will result in an increase of 2.39 in the total community income, which includes direct and indirect impacts. Additionally, the value of the ratio multiplier income type II 3.66 shows that an increase of 1 rupiah in business unit income from tourist expenditure will result in an increase of 3.66 in the total community income generated between local totals of tourists, taxes, and expenses induced later (continued), which is then divided by the income of the local business from tourist expenses.

Table 6 Analysis of tourism multiplier effect

Remarks	Number of the multiplier effect
Keynesian Local Income	0.91
Ratio Income Multiplier Type I	2.39
Ratio Income Multiplier Type II	3.66

The development of tourism areas needs to be considered several factors as follows: 1) financial feasibility in developing tourism areas, not only the large-scale business sector but the small and medium business sector, in order to increase tourism; 2) socio-economic feasibility is seen from how much this tourism has an impact on the economy, therefore it is necessary to design a development strategy to increase people's income; 3) technical feasibility needs to be improved because it affects the interest of tourists to access and enjoy services and tourist objects in the tourism area.

The results of the multiplier effect analysis can be concluded that tourists visiting North Rupat contribute to local community income. The existence of North Rupat tourism development indirectly impacts more than 150% of tourism revenue. Strategy after strategy needs to be carried out for sustainable tourism development, especially by: 1) increasing the reach of information on tourism in North Rupat by branding tourism appropriately; 2) increasing the quality of tourism services through improving infrastructure, main facilities, and supporting facilities, and increasing human resources for sustainable tourism management; 3) maintain and manage services to tourists

Considering that the studied area is a structural part, an important subsystem of the natural environment with a major role in the preservation and protection of biodiversity, the problem of promoting and capitalizing it through tourism arises which is in complete accordance with the principle of development (Dehoorne et al, 2019).

A brand is one of the most strategic assets which plays a very important role in the market competition (Matlovic et al, 2012). The territory brand building and the attempts to influence its brand are a common part of the local government activities practically all around the world. Their work is supported by the number of expert studies that examine the process of the territory image creation and their brands in the target one of the population is a tourist (Matlovic and Matlovicova, 2012). On the basis of the numerous studies devoting to the research of the impact of the declared place of the product origin on the customers, it is accepted currently that the brands of the country of the origin are affecting the image of the product (Matlovicova et al, 2016). Moreover, language is the most important point of the signs using which the city communicates with its real, and potential users are deciphered differently (Matlovicova et al, 2019; 2020). Tourism branding can be done by improving the quality of human resources that needs to be carried out by holding outreach on tourism development. Likewise, training to form a creative mindset in local communities and produce creative products, both goods, and services that can produce added value. All forms of training and workshops must include aspects of increasing awareness, understanding, skills, and professionalism (Kolas, 2008)

From the results of the study, it can be concluded that marine tourism in the North Rupat District has a potential for development because it is an archipelago that has a beach with clean sand and many coastal areas. An important strategy that must be carried out for the development of tourism in the District of North Rupat is the development of plans that can increase tourist arrivals, increase supporting facilities and infrastructure, and increase income. From the multiplier effect analysis, it was concluded that tourists visiting the North Rupat District contribute to the income of the local community, so that can be improved through sustaina-

ble tourism development in North Rupat, branding tourism appropriately, improve infrastructure, maintain services, and improve the quality of human resources.

Acknowledgement

We thank the University of Riau Research and Community Service Institute for giving us the opportunity to research the University's Flagship Research scheme in 2017. Contract number: 892 / UN.19.5.1.3 / PL / 2017

REFERENCES

AMIR, A., TAUFAN, D.S, FAUZI, R. (2020). Identifying Potential and Development Status of Tourism Village Development in Central Lombok Regency, West Nusa Tenggara. *Journal of Regional and Rural Development Planning*. 42,8, 84-98

BUJDOSO, Z., GYURKO, A., BENKO, B. (2019). Tourism Development in Hungary on the Example of the Northern Hungary Region. *Folia Geographica,* 61, 2, 86-103.

CHOIRIYAH, I. (2017). Dampak sosial-ekonomi wisata terhadap masyarakat lokal (Studi pada wisata pemancingan Delta Fishing Sidoarjo). In *Prosiding Seminar dan Call For Paper*, 21.

CONNELLY, A., SAM, S. (2018). How can policy assist the development of community-based tourism in Guyana by 2025 and beyond?. *Worldwide Hospitality and Tourism Themes*.

DANGI, T., JAMAL, T. (2016). An integrated approach to "sustainable community-based tourism". *Sustainability*, 8, 5, 475.

DARWANTO, H., STEPANTORO, D. (2000). Penataan Ruang Kawasan Pesisir, Laut, dan Pulau-Pulau Kecil, serta Hubungan dengan Penataan Ruang Wilayah. *Perencanaan Pembangunan*, 21, 20–27.

DEHOORNE, O., MIHAELA, O.V., TUDOR, C. (2019). Tourist Resources assessment in Pandorea Craiului Mountains. Folia Geographica, 61,2,163-171.

ESTOL, J., CAMILLERI, M, FONT, X. (2018). European Union tourism policy: an institutional theory critical discourse analysis. *Tourism Review*.

KOLAS, A. (2008). *Tourism and Tibetan Culture in Transition*. Routledge. New York.

GARZA-RODRIGUEZ, J. (2019). Tourism and poverty reduction in Mexico: An ARDL cointegration approach. *Sustainability*, 11, 3, 845.

LIN, L., MAO, C. (2015). Food for memories and culture–A content analysis study of food specialties and souvenirs. *Journal of Hospitality and Tourism Management*, 22, 19–29.

MATHOURAPARSAD, S., MAURIN, A. (2017). Measuring the multiplier effects of tourism industry to the economy. *Advances in Management and Applied Economics*, 72, 123.

MATLOVIC, R., MATLOVICOVA, K. (2012). The Social Relevance and Branding of Geography. *Geografie*, 117, 1, 33-51

MATLOVIC, R., MATLOVICOVA, K. (2020). First and Second Order Discontinuities in World Geographical Thought and their Primary Reception in Slovak Geography. *Folia Geographica*, 62, 1, 52-76

MATLOVICOVA, K., KOLESAROVA, J., MATLOVIC, R. (2016). Selected Theoretical Aspects of the Destination Marketing Based on Participation of Marginalized Communities. Conference:8th International Annual Scientific, Czech Republic. Date :OCT 19, 2016, pp. 128-143.

MATLOVICOVA, K., TIRPAKOVA, E., MOCAK, P. (2019). City Brand Image: Semiotic Perspective a Case Study of Prague. *Folia Geographica*, 61, 1, 120-142.

O'DONNELL, M. (2001). MESCOT-Model of Ecological Sustainable Community Tourism Development. in. ESCAP/WTO/IOTO National Seminar on Sustainable Tourism Development and Coastal Tourism Management in Indonesia, Jakarta, Indonesia.

ØIAN, H., FREDMAN, P., SANDELL, K., SÆÞÓRSDÓTTIR, A.D., TYRVÄINEN, L., JENSEN, F.S. (2018) *Tourism, nature and sustainability: A review of policy instruments in the Nordic countries*. Nordic Council of Ministers.

OKTAVIANI, R., Suryana, R. (2019). Analisis kepuasan pengunjung dan pengembangan fasilitas wisata agro (Studi kasus di Kebun Wisata Pasirmukti, Bogor). *Jurnal Agro Ekonomi*, 24, 1, 41-58.

PAPPAS, N. (2014). Hosting mega events: Londoners' support of the 2012 Olympics. *Journal of Hospitality and Tourism Management*, 21, 10–17.

PLANNING AND INFORMATION BUREAU. (2017). *Pembangunan marina kembangkan pariwisata bahari pulau rupat*. Retrieved from https://maritim.go.id/pembangunan-marina-kembangkan-pariwisata-bahari-pulau-rupat/. Accessed on 18 September 2018.

RUSU, S. (2011). Tourism multiplier effect. *Journal of Economics and Business Research*, 17, 1, 70–76.

SAMIMI, J., SADEGHI, S. (2011). Tourism and economic growth in developing countries: P-VAR approach. *Middle-East Journal of Scientific Research*, 10, 1, 28–32.

SAMMUT-BONNICI, T., GALEA, D. (2015). SWOT analysis. *Wiley Encyclopedia of Management*, 1–8.

SHAHZALAL, M. (2016). Positive and Negative Impacts of Tourism on Culture: A Critical Review of Examples from Contemporary Literatur. *Journal of Tourism, Hospitality and Sports*, 20, 30–35.

TARMIZI, T. (2016). *Riau berkomitmen jadi pusat kebudayaan Melayu di Asia Tenggara*. Retrieved from: https://www.antaranews.com/berita/565276/riau-berkomitmen-jadi-pusat-kebudayaan-melayu-di-asia-tenggara#mobile-nav. Accessed on 18 September 2018.

VLADI, E. (2014). Tourism Development Strategies, SWOT analysis and improvement of Albania's image. *European Journal of Sustainable Development*, 3, 1,167.

WORLD TRAVEL AND TOURISM COUNCIL. (2018). Travel & tourism: Global economic impact & issues 2018. London, UK: World Travel and Tourism Council. Retrieved from: https://dossierturismo.files.wordpress.com/2018/03/wttc-global-economic-impact-and-issues-2018-eng.pdf. Accessed on 18 September 2018.

FOLIA GEOGRAPHICA

An international scientific journal for theory, research and practice of geography and related disciplines.

The journal has been published since 1959, under the current title since 1998. It is published by University of Prešov. The editorial policy of journal is not under influence of sponsors. Folia Geographica publishes original research papers and review articles, all of which are refereed by at least two anonymous reviewers. To be accepted, a paper must adhere a high standard of scholarship and make a significant theoretical, conceptual, methodological or empirical contribution to geographic knowledge. It should be grounded in the relevant literature. Moreover, the contents of journal may include book reviews, invited essays and memorials.

ISSN 1336-6157 (hard copy)
ISSN 2454-1001 (online)
EV 4949/14

Editor-in Chief: prof. RNDr. René Matlovič, PhD.

Executive editor: doc. RNDr. Kvetoslava Matlovičová, PhD.

DTP: Ing. Stanislav Kurimai

Publisher: University of Prešov,
Ul. 17. novembra 15, 080 01 Prešov, Slovakia, IČO 17 070 775

Official e-mail: foliageographica@unipo.sk

Periodicity: Twice a year in June and December

This journal is available online:
www.foliageographica.sk/unipo/home

Instructions for authors can be found online at:
www.foliageographica.sk/unipo/instructions

Indexing: Clarivate Analytics Emerging Sources Citation Index (ESCI), SCOPUS, ERIH PLUS, ICI Journals Master List, Directory of Open Access Journals (DOAJ), Current Geographical Publications (CGP), Electronic Journals Library (EZB), ResearchBib, Google Scholar, ROAD directory, DRJI - Directory of Research Journals Indexing , Norwegian Register for Scientific Journals, Series and Publishers

DEPARTMENT OF GEOGRAPHY & APPLIED GEOINFORMATICS

PREŠOV, SLOVAKIA

FOLIA GEOGRAPHICA

Volume 62, 2020, No. 1

ISSN 1336-6157 (hard copy)
ISSN 2454-1001 (online)

EV 4949/14

VYDAVATEĽSTVO PREŠOVSKEJ UNIVERZITY

FOLIA GEOGRAPHICA