GeoJournal of Tourism and Geosites
ISSN 2065-1198, E-ISSN 2065-0817

Year XV, vol. 41, no. 2, 2022, p.354-361
DOI 10.30892/gtg.41203-837

INVESTIGATION OF ENVIRONMENTAL DETERMINANTS FOR AGRITOURISM DEVELOPMENT IN ALMATY REGION OF KAZAKHSTAN

Roman PLOKHIKH
Al-Farabi Kazakh National University, Faculty of Geography and Environmental Sciences,
Department of Recreational Geography and Tourism, Almaty, Kazakhstan, e-mail: rplokhikh@gmail.com

Gyula FODOR
Ferenc Rakoczi II Transcarpathian Hungarian College of Higher Education,
Department of Earth Sciences and Tourism, Berehove, Ukraine, e-mail: fodor.gyula@kmf.org.ua

Aiman SHAKEN
Al-Farabi Kazakh National University, Faculty of Geography and Environmental Sciences,
Department of Recreational Geography and Tourism, Almaty, Kazakhstan, e-mail: shaken_a@mail.ru

Sándor BERGHAUER
Ferenc Rakoczi II Transcarpathian Hungarian College of Higher Education,
Department of Earth Sciences and Tourism, Berehove, Ukraine, e-mail: berghauer.sandor@kmf.org.ua

Aliya AKTYMBAYEVA
Al-Farabi Kazakh National University, Faculty of Geography and Environmental Sciences,
Department of Recreational Geography and Tourism, Almaty, Kazakhstan, e-mail: aliyaaktymbayeva@gmail.com

Attila TÓTH
Ferenc Rakoczi II Transcarpathian Hungarian College of Higher Education,
Department of Earth Sciences and Tourism, Berehove, Ukraine, e-mail: toth.attila@kmf.org.ua

Miroslaw MIKA
Jagiellonian University, Institute of Geography and Spatial Management
Department of Tourism and Health Resort Management, Cracow, Poland, e-mail: miroslaw.mika@uj.edu.pl

Lóránt Dénes DÁVID*
Hungarian University of Agriculture and Life Sciences, Institute of Rural Development and Sustainable Economy,
Department of Sustainable Tourism, Gödöllő, Hungary, e-mail: david.lorant.denes@uni-mate.hu

Citation: Plokhikh, R., Fodor, G., Shaken, A., Berghauer, S., Aktymbayeva, A., Tóth, A., Mika, M., & Dávid, L.D. (2022). INVESTIGATION OF ENVIRONMENTAL DETERMINANTS FOR AGRITOURISM DEVELOPMENT IN ALMATY REGION OF KAZAKHSTAN. *GeoJournal of Tourism and Geosites*, 41(2), 354–361. https://doi.org/10.30892/gtg.41203-837

Abstract: This study aims to comprehend relations between environmental determinants and agritourism by example of the Almaty region of Kazakhstan. As a basis for the research of this specific content the representation about agrarian recreational-tourist complexes (ARTCs) was developed and applied (ARTCs are special territorial and intersectoral integrities which largely depend on environmental determinants). Agritourism development is presented as the most important prerequisite for different successful tourism activities in Kazakhstan. With use of the developed instruments, information of different types and cartographical data 15 ARTCs were identified within the Almaty region as well as the influence of the environmental determinants for agritourism was studied. In bare outlines, the methods of functional agritourism and ecological agritourism analysis of the ARTCs' territory based on analysis of the environmental determinants are described. The results of the research can be used for the establishment of prospects for agritourism development within the ARTCs as well as for the development of address recommendation system.

Key words: agritourism, environmental determinants, complex, assessment, Kazakhstan

* * * * * *

INTRODUCTION

The concept "agritourism sector of the economy" is gradually becoming more and more blurred. In a market economy it is possible to observe the development not of individual agritourist enterprises, but that of the special intersectoral agrarian recreational-tourist complexes (ARTC), which are formed on the basis of a business partnership. This is due to the fact that the agritourism sector of the economy produces consumer goods (for example, food, souvenirs, special catalogues, maps etc.) and services (for example, accommodation in a guest house, transfers, excursions, entertainment etc.) (Sznajder et al., 2009). One of the main prerequisites for sustainable development of the ARTCs (agritourism at the regional level) is a system of concrete

* Corresponding author

environmental determinants. The concept "environmental determinants" can be attributed to both theoretically and practically quite poorly studied agritourism, because there is no generally accepted definition and there is no consensus about its composition. The researchers provide recommendations for assessing individual environmental determinants but the examples of assessment technologies are generally lacking (Sharpley and Sharpley, 1997; Okumus et al., 2018). An important role in spatial research of environmental determinants is played by geographical, geoecological and cartographic approaches, which are especially useful for the analysis of heterogeneous and multifunctional ARTCs. Conducting special studies on environment and the environmental determinants for territories of agritourism at regional level allows optimizing the common use of natural resources in agritourism and other economic activities, as well as equipping the stakeholders with accurate information about environmental threats of natural and anthropogenic nature for agritourism. The study of environmental determinants is equally necessary for planning and generating alternative options for agritourism development, for formation of plans with required optimization measures, for monitoring the negative impacts, environmental conditions and for efficient managing the use of the spatial resources. Agritourism is defined as one of the high-priority types of recreation (short-term rest) and tourism (specialized long-term rest) in the Almaty region of Kazakhstan at the state level. However, modern environmental management in the region does not take into account its stringent requirements for the quality of the environment and local foodstuffs. The interests of agritourism are considered by most nature users as secondary, therefore agritourist nature management is superimposed on the existing form / forms of nature management with insufficient consideration of environmental sustainability and development of nature management conflicts. In conditions of not using the achievements of environmental audit and environmental impact assessment, it is possible to destroy positive determinants, valuable resources and qualities of agritourism territories. Assessment and mapping of the environment and its components can help in solving the problem of sustainable development of agritourism.

THEORETICAL BACKGROUND

When providing a theoretical basis for the research, the main attention was paid to: (a) images and typologies of agritourism which are promoted by various organizations and farmers and are interesting for tourists; (b) presentations about the ARTCs, which are extremely poorly identified in modern scientific literature; (c) environmental determinants of agritourism development, which are the most important conditions for successful agritourism activities, but are very ambiguously perceived in the sphere of scientific support development for agritourism and practical work.

1. Typologies of agritourism

Practitioners and researchers apply the term "agritourism" to different activities (Brandth and Haugen, 2011; Potočnik et al., 2013). There is no common understanding of the "agritourism" concept in the scientific community, which proves the use of a large number of terms: "agritourism", "agrotourism", "farm tourism" etc. This causes difficulties from the view of improving the knowledge basis of this activity and the identification of the environmental determinants for its successful development. From theoretical point of view, agritourism can be a sustainable form of tourism, often integrated into regional development, main purpose of which must be to promote rural capital and stimulate the local economy (Phelan and Sharpley, 2012; Flanigan et al., 2014; Streifeneder, 2016). An interesting interpretation of the "agritourism" concept was proposed by R. Sharpley and J. Sharpley: "tourist products that are directly related to the agrarian environment, agrarian products or agrarian stay" (Sharpley and Sharpley, 1997). Some definitions of the "agritourism" term emphasize the different natural-geographical resources (Roberts and Hall, 2001; Sznajder et al., 2009; Phillip et al., 2010; LaPan and Barbieri, 2014; Kline et al., 2015), sociocultural (Roberts and Hall, 2001; Phillip et al., 2010; LaPan and Barbieri, 2014), political and economic aspects (Frater, 1983; Roberts and Hall, 2001; Tew and Barbieri, 2012; Dubois et al., 2017). Agritourism is based on the environmental determinants of the rural area, features of local agriculture offer many options for recreation programs. Among them: resting in a "green" or natural environment (Gao et al., 2014), rural gastronomy (Kline et al., 2015), rural lifestyle (Disez, 1999; Garrod et al., 2006; Tew and Barbieri, 2012), getting familiar with the local material and non-material cultural heritage (Domenico and Miller, 2012; Choo and Petrick, 2014). Rich variety of interpretations confirm the need to develop a typology of agritourism, causing difficulties in identifying the environmental determinants of its development.

Creating a typology of agritourism is not an easy task and is largely related to the properties of the rural environment, which determines the development of specific types of agritourism in a certain area. The typology developed by Phillip et al., 2010 and its modified version (Flanigan et al., 2014) represent a serious attempt to classify agritourism on the basis of a systematic set of criteria. In particular, Flanigan et al. (2014; 2015) revealed the common features and differences in definition of the term "agritourism" among its providers and the tourists. In general, they found out that a working agritourism enterprise, which provides interaction with agriculture, corresponds to the ideas of both groups in the best way. Gil Arroyo et al. (Arroyo et al., 2013) applied Phillip et al. (2010) original model in the study on agritourism among farmers, residents and agents for dissemination of the knowledge on the example of Missouri in North Carolina in the United States of America. Its outcomes confirm the results of Flanigan et al. (2014; 2015). Lane (2009) came to a conclusion that agritourism is "a series of product types, but not one homogeneous whole". And the production of each product depends on a specific set of environmental and other determinants.

The authors' concept of agritourism typology is based on the hypothesis that the influence of a certain range of environmental determinants initiates the development of specific agritourist products and services and can be made up of specific indicators for each ARTC. In assessing the complexes of one region, it is important to create a system of environmental determinants, which, to the greatest extent, reflects the natural factors, conditions and processes that influence the development of different types of agritourism. Figure 1 shows the proposed organizational graph of

agritourism typology for conditions of the Almaty region of Kazakhstan. It can be displayed with the mapping of links between the environmental determinants and tourism types and can be adapted rather quickly taking into account the characteristics of another region. Detailing the most important environmental determinants has little effect on increasing the accuracy and reliability of the research and leads to an increase in the number of indicators, therefore, to an increase in practical difficulties (in the volume of work on searching and processing the representative data).

2. Presentation about ARTCs

The concept of agrarian recreational-tourist complex (ARTC) as a producer of an agritourism product is largely based on the cluster concept and the theory of networks. There are many definitions of the term "cluster" in the works of various scientists (Novelli et al., 2006; Lane, 2009; Arroyo et al., 2013; Simonyan and Turitsyn, 2014; Flanigan et al., 2015; Karmanova et al., 2015). Cluster approach is broader and deeper than it is considered in most of the sources, because its goal is not only to explain the links between the individual components of the production system, but also the use of innovative technologies and alternative methodologies to achieve sustainable development. From this point of view, the cluster approach is appropriate in any multicomponent system as a tool to achieve maximum competitive advantages (Darbellay and Stock, 2012). Theory of networks forms an explanatory structure of interrelations, how separate rural areas within the ARTC as a tourist destination can interact, develop and be connected (Becheru et al., 2015).

ARTC is a set of determinants and stakeholders that ensure the production of agritourism products and interconnected links of different types (Klochkova, 2007). System-forming elements for ARTC include:

(a) recreation and tourist resources of rural areas as a factor in the formation and satisfaction of the demand for agrarian leisure and tourism;

(b) business entities as suppliers of agrarian goods and services;

(c) tourists as consumers of the final agritourism products. In the functional-territorial aspect, ARTC is a spatial network of recreational-tourist enterprises of different levels and the producers of goods, services and works. The level of ARTC development is characterized by:

(a) saturation of the rural territory with enterprises and producers (for example, number of agritourism farms, variety of produced agritourism goods, services and works etc.);

(b) volume of the costs (for example, cost of accommodation and meals for guests, payment for employees etc.);

(c) achieved level of infrastructure development (for example, capacity of accommodation sites, landscaping of agritourism territories etc.)

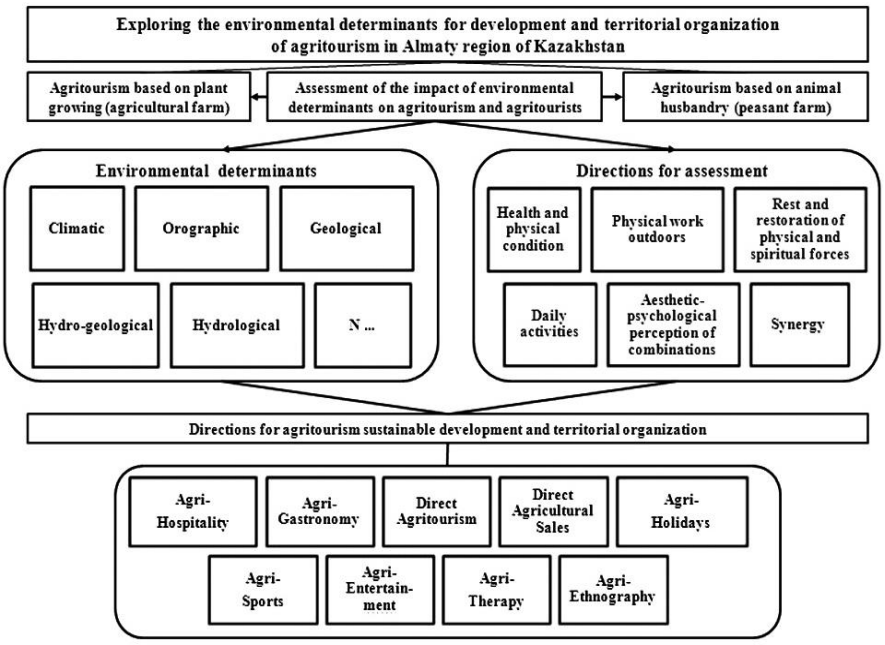

Fig. 1. Organizational graph of agritourism typology for the conditions of Almaty region of Kazakhstan [compiled by the authors]

The existence of a large number of unique natural and historical-cultural sites as well as comfortable environmental conditions increase the attendance of an ARTC. The main principle of the allocation and mapping of an ARTC is the identification of holistic territorial entities by nature of the favorable conditions of different determinants for agritourism development. When such territories are close to each other, the possibility for development of different ties (production and economic, transport and communication, information and others) between them is higher.

3. Environmental determinants of the development of agritourism

Environmental determinism, also known as geographical determinism, is the determination of the influence of the physical environment and its components on occurrence of certain development ways (Rozman et al., 2009; Keighren, 2015). Scientists have noted for long the impact of the geographic environment on humans and their entire livelihood. Jared Diamond (Diamond, 1999), Jan Morris (Phillips, 2001), Jeffrey Herbst (Herbst, 2014) and other scientists explain the advantages of different civilizations by the available geographical factors that allow them to develop faster and more efficiently. The philosophical school "Neoecological determinism" is focused on the study of geographic and ecological forces that predetermine the state-building, economic development and other aspects of human society's activity. On one hand, empirical evidences show that economic development accelerates environmental degradation (Sörlin, 2013; Araújo Rios et al, 2015; Omri et al., 2019; Wang and Yotsumoto, 2019). On the other hand, environmental determinants have a strong influence on all types of economic activity and can accelerate or slow down their development (Hung et al., 2016; Sellers-Rubio and Casado-Díaz, 2018). The presence of adverse environmental determinants reduces the agritourism capacity and attractiveness of a territory, but the presence of favorable ones, on the contrary, increases these features. Diversity of environmental determinants

in large areas, uneven allocation and use of resources, ecological and socio-economic characteristics of the territory determine the formation of ARTCs with different combinations of agritourism specialization: plant growing, animal husbandry, vine-growing, apiary, gastronomy, entertainment and others. Studying the advantages of two types of agricultural areas producing agritourism products on the example of farms and cultivated forests showed the similarity of the services provided in general. But the respondents' assessment of the lifestyle resulting from the exposure to various environmental determinants and attractive elements of the agritourism environment differed quite remarkably (Barbieri et al., 2019). The study also demonstrated the hidden impact of environmental determinants on agritourism, which is expressed not only through the direct impact on agritourism products, goods and services, but also on the lifestyle of the owners as an additional attractive factor. Besides the environmental determinants, the development of agritourism is strongly affected by the size of its enterprises, quantity and quality of human resources as well as the business model of agritourism itself (Stange et al., 2010; Cucari et al., 2019).

RESEARCH FRAMEWORKS

1. Research background and design

This study was conducted in 2017-2018 as a component of a doctoral dissertation, but it is rooted in four more large research projects. Among them are the following ones: "Geographical basis for ensuring the safety of nature management of mountain and lowland territories of the Republic of Kazakhstan" and "Geographical support of accelerated tourism development in Kazakhstan" (conducted by the Institute of Geography by order of the Ministry of Education and Sciences of the Republic of Kazakhstan, 2012-2014); "Sustainable livelihood initiative in Russia and Kazakhstan" (conducted by a working group under the supervision of R. Plokhikh within the framework of the World Wildlife Fund (WWF) grant number WWF419/RU007422/GLO, 2014); "Conceptual model for activation of rural territories of the Republic of Kazakhstan through agritourism development" (conducted by the Research Institute of Ecology Problems at the Al-Farabi Kazakh National University by order of the Ministry of Education and Science of the Republic of Kazakhstan, 2015-2017). These projects, to a small extent, have dealt with the problems of environmental determinants of agritourism and sustainable development of the ARTCs. At the same time, at working meetings of the Tourism Department of the Almaty region and the Department of Tourism and External Relations of the city of Almaty, emphasizing the importance of solving the tasks of developing the regional economy the agritourism sector was noted repeatedly. The study, described in this article was implemented on the basis of a logical scheme that included 13 areas of work combined in four stages. The preparatory stage included the definition of the object, subject and objectives of the study. As part of the methodological stage, a research plan was drawn up, work with various sources of published and stock information was carried out, methods were defined and research conditions were organized. The implementation stage included works on data collection and its processing. The main type of work at the final stage was the formulation of conclusions and their discussion with stakeholders.

2. Location

The study was conducted in the Almaty region, which is located in South-East Kazakhstan. It was established in 1932, has an area of 223.6 thousand km^2 (8.2 % of the country's area) and includes 20 administrative-territorial units: 16 rural areas, 3 territories subordinated to the administrations of Taldykorgan, Kapshagay and Tekel towns and the Almaty agglomeration which is the largest in the country. As of January 1, 2019 the total number of rural districts equaled to 246. The administrative center is located in the Taldykorgan town, which is near the Karatal river. The topography of the territory is very complicated. The northern part of the region is bounded by the southern coast of the large, intra-continental Balkash Lake (area 16.9 thousand km^2). This area is represented by the slightly inclined aeolian plain of Zhetysu with elevations of 300–500 m. The southern and eastern parts of the region are represented by the foothill and mountain landscapes of Ile Alatau (Talgar peak, 4973 m), Zhetysu Alatau (Besbakan mountain, 4622 m), Ketmen or Uzynkara (Nebesnaya mountain, 3653 m). From the southeast to the northwest the territory is crossed by the valley of the river Ile, in the central part of which one of the largest reservoirs in Kazakhstan, the Kapshagay was built (water-surface area – 1,874 km^2, length – 80 km, width – 40 km) (Regions of Kazakhstan in 2017: statistical compilation, 2018). The foothills are the most comfortable in their natural characteristics, therefore this is a highly urbanized area. As of January 1, 2019 he total population of the region reached as high as 3,893.9 thousand or 21.2 % of Kazakhstan's total population. The rural population was 1,552,800 people or 39.9 % of the total population of the Almaty region (About changes in population of the Republic of Kazakhstan: statistical publication, 2019). Development of all possible types of tourism in the region is defined as one of the main long-term priorities. The urgency of solving this task is reinforced by the development of tourist infrastructure near "Western Europe – Western China" international transport corridor, which runs through the Almaty region.

3. Communities and participants

Within the framework of the methodological stage the research conditions were organized. An agreement about the assistance in the works of the "Atameken" National Chamber of Entrepreneurs of Kazakhstan was obtained. In course of the research 45 agritourism enterprises located in 15 ARTCs were studied. They represent the following directions for sustainable development of agritourism: a – agri-hospitality; b – agri-gastronomy; c – direct agritourism; d – direct agricultural sales; e – agri-holidays; f – agri-sports; g – agri-entertainment; h – agri-therapy; i – agri-ethnography (Table 1). The largest amount of examined agritourism enterprises is located in the Kapshagay and Ile-Alatau ARTCs. This is explained by their proximity to the Almaty agglomeration, which is the main consumer of the agritourism products in the Almaty region.

4. Materials and methods

As a source of initial information statistic, analytical and cartographic materials were used. Primarily, data of the

Department of Statistics of the Almaty Region and of the Committee on Statistics of the Ministry of National Economy of Kazakhstan as well as the official information of public and private institutions for 1991–2018 years were studied. Additional qualitative and quantitative data were collected in 2017–2018.

Table 1. Territorial distribution of the examined agritourism enterprises

ARTCs	Amount of agritourism enterprises	Directions of the sustainable development of agritourism
Ile-Alatau	10	a+e; a+c; a+b; a+e; a+b+d+i; g+b; a+i+h; a+b; a+b; a+i+b+g
Chimbulak-Tabagan-Akbulak	3	a+e+f; a+f+g+i; a+i
Kapshagay	11	a+h+b+d; a+b+c+g; a+e; a+h+b+d; a+i+b; a+i; a+e; a+h+d+b; a+h; a+b+f+i; a+c+e+g
Kolsay-Kegen	2	a+i; a+e+b
Zharkent	1	a+e
Taldykorgan-Zhetysu-Alatau	2	a+c+d+g; a+e
Alakol-Sasykkol	1	a+f+i
Sarkand-Zhetysu-Alatau	1	a+d+f
Koyandytau-Toksanbay	5	a+d; a+d+h+i; a+d; a+c+d; a+d+h
Shonzhy-Naryn	2	a+g+c; a+g+c+i
Uzynkara	1	a+b+g+i
Ile-Balkash	2	a+c+e; a+e+d+i
Lepsy-Aksu	2	a+f; a+f
Arganaty-Zhekeshagyl	1	a+e
Aralkum	1	a+e

The existent informative systems and additional refreshed and filled-up information sources also were used: Kazakhstan National Electronic Library (http://www.kazneb.kz); "Әділет" Database of Regulatory-Legal Acts of Kazakhstan (http://adilet.minjust.kz); official portal "Electronic Government of the Republic of Kazakhstan" (http://www.e.gov.kz), official sites of the Ministry of Education and Sciences of the Republic of Kazakhstan (http://www.edu.gov.kz), the Ministry of Healthcare and Social Development of the Republic of Kazakhstan (http://www.mzsr.gov.kz), the Ministry of Culture and Sport of the Republic of Kazakhstan (http://mk.gov.kz), the Akimat (government representative) of Almaty region (http://zhetysu-gov.kz), the Akimat of Almaty city (http://almaty.gov.kz), the Program of Monitoring of the Government Social Order Execution (http://monitoring.academy.kz), "All Kazakhstan" Reference Portal (http://www.kps.kz) and the Portal About Real Estates (http://www.kn.kz). For making the information database more complete, the annual reports and statements of the Almaty Akim, heads of agencies and organizations of Almaty region, the archive of the JST "National Center of Scientific and Technical Information" of Kazakhstan, scientific articles, scientific conferences' proceedings and publications in mass media were also used. Besides that, an integrated approach of studying the environmental determinants of agritourism development in Almaty region of Kazakhstan was applied in the research.

It relied on a combination of the following methods and techniques: web-analysis for identification of useful information resources; content analysis of the documents, archive data, scientific literature and other text materials; applying classification and categorization methods for logical structuring and generalization of the information; statistical analysis for establishing development patterns for natural phenomena and processes as well as for determining the possibility of their repetition; expert assessment for obtaining the assessment in conditions of information lack for analysis; method of aggregated indicators, in particular the calculation of the degree index for environmental sustainability threats on territories of agritourism and its gradation in the form of an assessment scale; extrapolation of regularities for whole territory of the ARTCs, identified on model sites of agritourism enterprises; visualization in form of graphical schemes based on CorelDraw Graphics Suite X7; analysis of maps based on ArcGIS 10 of the ESRI company. The technique of functional agritourism analysis was based on the cumulative assessment of the environmental determinants and the existing and potential services of agritourism in the ARTCs. The threshold (maximum) values of the functional diversity coefficient for services and products of agritourism by the specially developed equation are calculated as follows (Sznajder et al. 2009):

$$E = \frac{Ms_{1...5}}{Ms_{max}} * 100\%$$

where: T – threshold (maximum) value of the functional diversity coefficient for agritourism; $Ms_{1...5}$ – diversity assessment of the existing and possible agritourism services on a five-point scale; Ms_{max} – the maximum value of existing and possible agritourism services in the region (equals to 25).

Index of degree of threats for environmental sustainability on agritourism territories is also calculated by using a specially developed equation (Okumus et al. 2018):

$$\overline{TD} = \frac{\sum_{i=1}^{n} A_i SA_i}{\sum_{i=1}^{n} SA_i} = \frac{A_1SA_1 + A_2SA_2 + A_3SA_3 + A_4SA_4 + A_5SA_5}{SA_1 + SA_2 + SA_3 + SA_4 + SA_5}$$

where: $\overline{TD}$ – degree of threats; A_1, A_2, A_3, A_4, A_5 – expert assessments of phenomena / processes on the territory of each ARTC in 1 point, 2 points, 3 points, 4 points and 5 points; SA_1, SA_2, SA_3, SA_4, SA_5 – sum of assessed phenomena / processes on the territory of each ARTC with expert rating in 1 point, 2 points, 3 points, 4 points and 5 points.

RESULTS AND DISCUSSION

Within the Almaty region 15 agrarian recreational-tourist complexes (ARTCs) were identified by using cartographical data. They are under the influence of certain combinations of environmental determinants and business partnerships which were formed in the sphere of agritourism. Table 2 shows their main properties: significance; seasonality; natural conditions; area in km^2 and the proportion from total area of the region in %. These data demonstrate that the importance of ARTCs does not depend on their areal characteristics and predominant seasonality, but it is closely related to natural conditions. The spatial dispersion of population and economy, which are identified of

the environmental determinants of the mountainous and lowland areas results in a generalized assessment ineffective for all Almaty region. Since the space is very diverse concerning the environmental determinants, this predetermines the specificity of each ARTC in terms of the agritourism development possibilities.

Table 2. Main properties of agrarian recreation-tourist complexes in Almaty region

ARTCs	Significance	Predominant seasonality	Natural conditions	Area in Almaty region	
				km^2	%
Ile-Alatau	National	Year-round	Extremely comfortable	14287	6.4
Chimbulak-Tabagan-Akbulak	National	Winter	Extremely comfortable	1675	0.7
Kapshagay	National	Summer	Extremely comfortable	12629	5.6
Kolsay-Kegen	National	Summer	Extremely comfortable	6916	3.1
Zharkent	National	Year-round	Extremely comfortable	5541	2.5
Taldykorgan-Zhetysu-Alatau	National	Year-round	Extremely comfortable	14319	6.4
Alakol-Sasykkol	Regional	Summer	Comfortable	5888	2.6
Sarkand-Zhetysu-Alatau	Regional	Year-round	Comfortable	13647	6.1
Koyandytau-Toksanbay	Regional	Summer	Comfortable	6409	2.9
Shonzhy-Naryn	Regional	Year-round	Comfortable	8043	3.6
Uzynkara	Local	Summer	Complicated	2482	1.1
Ile-Balkash	Regional	Year-round	Comfortable	3913	1.7
Lepsy-Aksu	Regional	Summer	Comfortable	22631	10.1
Arganaty-Zhekeshagyl	Local	Summer	Complicated	5533	2.5
Aralkum	Local	Summer	Complicated	5879	2.6

Table 3. The functional-agritourism analysis

ARTCs	Agritourism's natural potential	Coefficient of functional diversity for agritourism services and products (%)	Existing and possible agri-tourism services (units)
Ile-Alatau	very high	80–100	21–25
Chimbulak-Tabagan-hAkbulak	low	0–20	1–5
Kapshagay	high	60–80	16–20
Kolsay-Kegen	middle	40–60	11–15
Zharkent	middle	40–60	11–15
Taldykorgan-Zhetysu-Alatau	very high	80–100	21–25
Alakol-Sasykkol	high	60–80	16–20
Sarkand-Zhetysu-Alatau	high	60–80	16–20
Koyandytau-Toksanbay	middle	20–40	6–10
Shonzhy-Naryn	low	0–20	1–5
Uzynkara	low	0–20	1–5
Ile-Balkash	high	80–100	16–20
Lepsy-Aksu	middle	0–20	1–5
Arganaty-Zhekeshagyl	very low	0–20	1–5
Aralkum	very low	0–20	1–5

Table 4. The ecological-agritourism analysis

ARTCs	Index of environmental sustainability degree threats for agritourism territories			
	natural		anthropogenic	
	value	degree threats	value	degree threats
Ile-Alatau	more than 4.2	very high	more than 4.2	very high
Chimbulak-Tabagan-Akbulak	1.8–2.5	moderate	less than 1.7	low
Kapshagay	2.6–3.3	increased	3.4–4.1	high
Kolsay-Kegen	2.6–3.3	increased	less than 1.7	low
Zharkent	3.4–4.1	high	2.6–3.3	increased
Taldykorgan-Zhetysu-Alatau	more than 4.2	very high	more than 4.2	very high
Alakol-Sasykkol	2.6–3.3	increased	1.8–2.5	moderate
Sarkand-Zhetysu-Alatau	3.4–4.1	high	3.4–4.1	high
Koyandytau-Toksanbay	more than 4.2	very high	1.8–2.5	moderate
Shonzhy-Naryn	2.6–3.3	increased	less than 1.7	low
Uzynkara	3.4–4.1	high	1.8–2.5	moderate
Ile-Balkash	3.4–4.1	high	2.6–3.3	increased
Lepsy-Aksu	less than 1.7	low	1.8–2.5	moderate
Arganaty-Zhekeshagyl	3.4–4.1	high	less than 1.7	low
Aralkum	1.8–2.5	moderate	less than 1.7	low

The study of environmental determinants implied an assessment of their features, needs and opportunities for use. Positive environmental determinants are understood as the presence in the territory of certain unique or interesting features of natural properties which are valuable not only for the local residents. For balanced development of such territories intended for agritourism, environmental determinants must represent an integral self-organizing system and can appear in unequal structural and dynamic states. Natural potential of the territory is variable. According to its characteristics, it is not heterogeneous, because some of the objects have a hard-to-estimate character of attraction. Among environmental

determinants the following were considered: orographic, climatic, hydrological, floristic, faunistic, balneological (of different genesis). The assessment of the functional diversity of agritourism in each ARTC was carried out with the help of the amount of existing and possible types of services. The attractions for agritourists are the ARTC sites with the most extensive opportunities for agritourism services development, which create the choice of the recreation and tourism type for the consumers. The agritourism value of the territory decreases with the diminishing of the positive environmental determinants and has the smallest importance with monotonous relief and uncomfortable climate, water deficiency, poorly represented flora and fauna which limit the staying in open space. It was established that the total coefficient of functional diversity for agritourism services and products in % varies at five ranges: low (0–20 %), moderate (20–40 %), elevated (40–60 %), high (60-80 %) and very high (80–100 %), which corresponds to the following options: (1) natural potential – very low, low, middle, high, very high; (2) the number of existing and possible agritourism services – 1–5, 6–10, 11–15, 16–20, 21–25 (Table 3). The analysis of environmental determinants of ecological agritourism in the territory of the Almaty region was carried out based on study of limitations for agritourism development within each of 15 ARTCs, caused by: (a) natural environmental threats; (b) anthropogenic environmental threats. Then, index of environmental sustainability degree threats for agritourism territories was calculated (Table 4). The sum of phenomena / processes estimated on a five-point scale was the following: 76 – for natural character threats; 37 – for anthropogenic character threats.

CONCLUSIONS AND RECOMMENDATIONS

Completed researches of environmental determinants of agritourism development in the Almaty region gave the following results:

(a) we generalized agritourism images and proposed agritourism typology, which can be represented differentially by mapping of relations between environmental determinants and types of agritourism as well as can be quickly adapted for characteristics of another region;

(b) we could fill with specific content presentations about the ARTC as agritourism product producer, which largely depends on environmental determinants;

(c) we presented authors' interpretation of environmental determinants for agritourism development as the most important conditions for successful agritourism activities, though this concept is perceived very ambiguously in the sphere of developing scientific support for agritourism and practical work;

(d) 15 ARTCs within the Almaty region were identified as well as we studied the influence of certain combinations of environmental determinants on agritourism;

(e) methods of functional-agritourism and ecological-agritourism analysis of the ARTC territory based on environmental determinants were developed and tested;

(f) functional-agritourism analysis allowed to evaluate the following characteristics for each ARTC: agritourism natural potential; functional diversity coefficient for agritourism services and products; existing and possible services of agritourism;

(g) ecological-agritourism analysis allowed to evaluate for each ARTC the indexes of degree for environmental sustainability; natural and anthropogenic threats on agritourism territories.

Based on the results of the functional-agritourism and ecological-agritourism analysis, it is possible to establish the prospects for agritourism development within each ARTC and develop a system of actions for its support as important tourism type for the region from the strategic point of view.

Acknowledgments

Researches were developed within the framework of the contract No. 375 dated 12.24.2018: "Clause 18) include the following proposals on packages (labels) of the final product obtained as part of the project: "Product of Kazakhstan's Science" and "Financed by JSC "Science Fund"; project "Modernization of digital tourism content: mobile applications, panoramic 3D tours, interactive maps and QR codes".

REFERENCES

Araújo Rios, R., Parrott, L., Lange, H., & Fernandes de Mello, R. (2015). Estimating determinism rates to detect patterns in geospatial datasets. *Remote Sensing of Environment, 156*, 11-20. https://doi.org/10.1016/j.rse.2014.09.019

Arroyo, C.G., Barbieri, C., & Rozier Rich, S. (2013). Defining agritourism: A comparative study of stakeholders' perceptions in Missouri and North Carolina. *Tourism Management, 37*, 39-47. https://doi.org/10.1016/j.tourman.2012.12.007

Barbieri, C., Sotomayor, B.C., & Aguilar, S.F.X. (2019). Perceived Benefits of Agricultural Lands Offering Agritourism. *Tourism Planning and Development, 16 (1)*, 43-60. https://doi.org/10.1080/21568316.2017.1398780

Becheru, A., Buşe, F., Colhon, M., & Bădică C. (2015). Tourist review analytics using complex networks. *Proceedings of the "7th Balkan Conference on Informatics" Conference*. ACM. https://doi.org/10.1145/2801081.2801088

Brandth, B., & Haugen, M.S. (2011). Farm diversification into tourism – Implications for social identity? *Journal of Rural Studies, 27 (1)*, 35-44. https://doi.org/10.1016/j.jrurstud.2010.09.002

Choo, H., & Petrick, J.F. (2014). Social interactions and intentions to revisit for agritourism service encounters. *Tourism Management, 40*, 372-381. https://doi.org/10.1016/j.tourman.2013.07.011

Cucari, N., Wankowicz, E., & De Falco, S.E. (2019). Rural tourism and Albergo Diffuso: A case study for sustainable land-use planning. *Land Use Policy, 82*, 105-119. https://doi.org/10.1016/j.landusepol.2018.11.050

Darbellay, F., & Stock, M. (2012). Tourism as complex interdisciplinary research object. *Annals of Tourism Research, 39 (1)*, 441-458. https://doi.org/10.1016/j.annals.2011.07.002

Diamond, J.M. (1999). *Guns, germs, and steel: The Fates of Human Societies*. An Unabridged Audiobook. Random House Audio. https://doi.org/10.1080/05775132.1998.11472027

Disez, N. (1999). Agritourisme. Logiques d'acteurs ou logiques de territoires? *Économie Rurale, 250 (1)*, 40-46. https://doi.org/10.3406/ecoru.1999.5074

Domenico, M.L., & Miller, G. (2012). Farming and tourism enterprise: Experiential authenticity in the diversification of inde-pendent small-scale family farming. *Tourism Management, 33 (2),* 285-294. https://doi.org/10.1016/j.tourman.2011.03.007

Dubois, C., Cawley, M., & Schmitz, S. (2017). The tourist on the farm: A "muddled" image. *Tourism Management, 59*, 298-311. https://doi.org/10.1016/j.tourman.2016.08.016

Flanigan, S., Blackstock, K., & Hunter, C. (2014). Agritourism from the perspective of providers and visitors: A typology-based study. *Tourism Management, 40*, 394-405. https://doi.org/10.1016/j.tourman.2013.07.004

Flanigan, S., Blackstock, K., & Hunter, C. (2015). Generating public and private benefits through understanding what drives different types of agritourism. *Journal of Rural Studies, 41*, 129-141. https://doi.org/10.1016/j.jrurstud.2015.08.002

Frater, J.M. (1983). Farm tourism in England – planning, funding, promotion and some lessons from Europe. *Tourism Management, 4 (3)*, 167-179. https://doi.org/10.1016/0261-5177(83)90061-4

Gao, J., Barbieri, C., & Valdivia, C. (2014). Agricultural landscape preferences: Implications for agritourism development. *Journal of Travel Research, 53 (3)*, 366-379.

Garrod, B., Wornell, R., & Youell, R. (2006). Re-conceptualising rural resources as countryside capital: The case of rural tourism. *Journal of Rural Studies, 22 (1)*, 117-128. https://doi.org/10.1016/j.jrurstud.2005.08.001

Herbst, J. (2014). *States and power in Africa: Comparative lessons in authority and control: Vol. 149*. Princeton University Press. https://doi.org/10.1515/9781400852321

Hung, W.T., Ding, H.Y., & Lin, S.T. (2016). Determinants of performance for agritourism farms: an alternative approach. *Current Issues in Tourism, 19 (13)*, 1281-1287. https://doi.org/10.1080/13683500.2015.1037254

Karmanova, T.E., Podsevalova, E.N., Zikirova, S.S., Silaeva, A.A., & Leonova, V.P. (2015). Cluster model of regional tourist business in Russia. *Asian Social Science, 11(6)*, 279. https://doi.org/10.5539/ass.v11n6p279

Keighren, I.M. (2015). *Environmental Determinism. International Encyclopedia of the Social & Behavioral Sciences (2nd Edition)*. Oxford: Elsevier Science & Technology, 720-725. https://doi.org/10.1016/B978-0-08-097086-8.72016-2

Kline, C., Barbieri, C., & LaPan, C. (2015). The influence of agritourism on niche meats loyalty and purchasing. *Journal of Travel Research, 55 (5)*, 643-658. https://doi.org/10.1177/0047287514563336

Klochkova, T.V. (2007). *Development of management mechanism for recreational and tourist complex: by example of the Republic of Adygea* (Клочкова Т.В. *Развитие механизма управления рекреационно-туристским комплексом: на примере Республики Адыгея*). CSc-dissertation. Moscow, All-Russian Correspondence Financial and Economic Institute.

Lane, B. (2009). *Rural tourism: An overview*. In Jamal, T., Robinson, M. (Eds.), The Sage handbook of tourist studies. London, Sage, 354-370. https://dx.doi.org/10.4135/9780857021076.n20

LaPan, C., & Barbieri, C. (2014). The role of agritourism in heritage preservation. *Current Issues in Tourism, 17 (8)*, 666-673. https://doi.org/10.1080/13683500.2013.849667

Novelli, M., Schmitz, B., & Spencer, T. (2006). Networks, Clusters and Innovation in Tourism: the UK Experience. *Tourism Management, 27*, 1141-1152. https://doi.org/10.1016/j.tourman.2005.11.011

Okumus, F., Van Niekerk, M., Köseoglu, M.A., & Bilgihan, A. (2018). Interdisciplinary research in tourism. *Tourism Management; 69*, 540-549. https://doi.org/10.1016/j.tourman.2018.05.016

Omri, A., Euchi, J., Hasaballah, A.H., Al-Tit, Ah. (2019). Determinants of environmental sustainability: Evidence from Saudi Arabia. *Science of the Total Environment, 657*, 1592-1601. https://doi.org/10.1016/j.scitotenv.2018.12.111

Phelan, C., & Sharpley, R. (2012). Exploring entrepreneurial skills and competencies in farm tourism. *Local Economy, 27 (2)*, 103-118. https://doi.org/10.1177/0269094211429654

Phillips, R. (2001). Decolonizing geographies of travel: reading James/Jan Morris. *Social & Cultural Geography, 2 (1)*, 5-24. https://doi.org/10.1080/14649360020028249

Phillip, S., Hunter, C., & Blackstock, K. (2010). A typology for defining agritourism. *Tourism Management, 31 (6)*, 754-758. https://doi.org/10.1016/j.tourman.2009.08.001

Potočnik Slavič, I., & Schmitz, S. (2013). Farm tourism across Europe. *European Countryside, 5(4)*, 265-274. https://doi.org/ 10.2478/euco-2013-0017

Roberts, L., & Hall, D. (2001). *Rural tourism and recreation: principles to practice*. Wallingford, CAB International Publishing, Oxon and New York. ISBN: 0-85199-540-3. https://doi.org/10.1093/erae/30.2.273

Rozman, Č., Buşe, F., Colhon, M., & Bădică, C. (2009). A multi-criteria assessment of tourist farm service quality. *Tourism Management, 30 (5)*, 629-637. https://doi.org/10.1016/j.tourman.2008.11.008

Sellers-Rubio, R., & Casado-Díaz, A.B. (2018). Analyzing hotel efficiency from a regional perspective: The role of environmental determinants. *International Journal of Hospitality Management, 75*, 75-85. https://doi.org/10.1016/j.ijhm.2018.03.015

Sharpley, R., & Sharpley, J. (1997). *Rural tourism: an introduction*. International Thomson Business Press, London. https://doi.org/10.1002/(SICI)1522-1970(200003/04)2:2<148::AID-JTR210>3.0.CO;2-U

Simonyan, G.A., & Turitsyn, I.V. (2014). Issues of development of tourist-recreation complex of Crimea in market conditions. *European Journal of Economic Studies, 2*, 107-112. https://doi.org/10.13187/issn.2304-9669

Sörlin, S. (2013). Reconfiguring environmental expertise. *Environmental Science & Policy, 28*, 14-24. https://doi.org/10.1016/j.envsci.2012.11.006

Stange, J., Brown, D., Hilbruner, R., & Hawkins, D.E. (2010). *Tourism destination management achieving sustainable and competitive results*. Washington: US Agency for International Development.

Streifeneder, T. (2016). Agriculture first: Assessing European policies and scientific typologies to define authentic agritourism and differentiate it from countryside tourism. *Tourism Management Perspectives, 20*, 251-264. https://doi.org/10.1016/j.tmp.2016.10.003

Sznajder, M., Przezbórska-Skobiej, L., & Scrimgeour, F. (2009). *Agritourism.* CAB International, Oxford, UK. https://doi.org/10.1079/9781845934828.0000

Tew, C., & Barbieri, C. (2012). The perceived benefits of agritourism: The provider's perspective. *Tourism Management, 33 (1)*, 215-224. https://doi.org/10.1016/j.tourman.2011.02.005

Wang, L., & Yotsumoto, Y. (2019). Conflict in tourism development in rural China. *Tourism Management, 70*, 188-200. https://doi.org/10.1016/j.tourman.2018.08.012

*** About changes in population of the Republic of Kazakhstan: statistical publication (2019). Astana: Committee on Statistics of the Ministry of National Economy of the Republic of Kazakhstan.

*** Regions of Kazakhstan in 2017: statistical compilation (2018). Astana: Committee on Statistics of the Ministry of National Economy of the Republic of Kazakhstan.

Article history: Received: 27.12.2021 Revised: 14.02.2022 Accepted: 14.03.2022 Available online: 04.04.2022