

## Article

# Cultural Ecosystem Services: The Case of Coastal-Rural Area (Nemunas Delta and Curonian Lagoon, Lithuania)

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**Abstract:** The benefits or harms of external and internal consequences for the viability of ecosystems are revealed through the impact on the quality of human life. The issues of assessing these benefits or harms are significant for the whole society and are therefore analyzed from both theoretical and practical perspectives. The article seeks to theoretically examine the coherence between humans and ecosystems, ensuring the social and economic well-being of present and future generations in the context of cultural ecosystem services (CES). As well, the article seeks to present the empirical research, carried out on the possibilities of adapting human activities to CES in the specific area, i.e., coastal-rural area, evaluating the past, present and future CES potential in the Lithuanian coastal zone, Nemunas Delta and Curonian Lagoon in Lithuania. Elderships located near the Curonian Lagoon or within the protected area of the Nemunas Delta Regional Park were selected for the study. For this purpose, the empirical study involved representatives of different (public and private) sectors and stakeholders. The research was carried out in local tourism cultural centers and elderships with four group respondents (tourists, farmers, entrepreneurs, eldership employees). The research revealed the past and the current situation of CES potential and showed the possible CES potential future development directions. The article described the opportunities for the rural population (a potential supply of cultural ecosystems) to achieve diversification of economic activities and the needs of tourists (a potential demand for cultural ecosystems) to achieve service differentiation. Therefore, the recommendations have been formulated on how to exploit future CES of a specific territory by “employing” available natural resources, i.e., the ecosystems.

**Keywords:** cultural ecosystem services; ecosystem; Nemunas Delta; Curonian Lagoon



**Citation:** Marcinkevičiūtė, L.; Pranskūnienė, R. Cultural Ecosystem Services: The Case of Coastal-Rural Area (Nemunas Delta and Curonian Lagoon, Lithuania). *Sustainability* **2021**, *13*, 123. <https://dx.doi.org/10.3390/su13010123>

Received: 15 November 2020

Accepted: 22 December 2020

Published: 24 December 2020

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## 1. Introduction

The main challenge of the 21st century is to create economic, social, and environmental management mechanisms that would ensure current and future human well-being. Today, all sectors mainly focus on the following aspects: raising awareness of the interdependence of ecosystems and human well-being; science, which includes basic interdisciplinary knowledge of ecosystems and the implementation of this science in decision-making to restore ecosystem services and their sustainable use in the future. However, the successful implementation of economic, social, and environmental management mechanisms is still in the initial stage. Therefore, strategic decisions by the leaders of the government, business, and civil society are necessary for the establishment of theoretical and practical measures to increase the functionality of services provided by ecosystems.

For millennia, ecosystems have been useful for human well-being not only because of their tangible but also because of their intangible assets known as cultural ecosystem services (hereinafter—CES). According to Mowat and Rhodes [1], cultural ecosystem services make an important and valuable contribution to human well-being. Spanou et al. [2] note, that CES are increasingly central in understanding individual and community connections to ecosystems. Today, CES are identified as intangible ecosystem services

that meet the diverse cultural, social, and emotional needs of humans and refer to the nonmaterial benefits people obtain from ecosystems [3–9]. CES is a growing field of research characterized by a growing number of different academic disciplines: ecology, economics, and the social sciences [10,11]. Relevant research topics for the above services are related to the development and research of CES assessment methods [12], etc. According to scientific analysis, CES are suitable as a means of bridging the gap between different academic disciplines and scientific communities. Taking advantage of the social importance of CES, real problems could be solved by promoting new conceptual connections between alternative logic related to various social, cultural, and ecological (environmental) problems. CES are more comprehensible and meaningful to people than many other services.

Despite recent research, the assessment of CES still remains very individual and largely limited to the most in-demand tourism services. The article seeks to theoretically examine the coherence between humans and ecosystems, ensuring the social and economic well-being of present and future generations in the context of cultural ecosystem services (CES). As well, the article seeks to present the empirical research, carried out on the possibilities of adapting human activities to CES in the specific area, i.e., coastal-rural area, evaluating the past, present, and future CES potential in the Lithuanian coastal zone, Nemunas Delta and Curonian Lagoon in Lithuania.

The work of this article is organized as follows: in further sections, the literature review, divided into two subsections; the research setting, materials and methods, divided into two subsections. Additionally, results; discussion and recommendations; conclusions sections are presented.

## 2. Literature Review

### 2.1. Theoretical CES Insights

Lithuania has one important tourism resource—nature, also ecosystems created by it, where tourism infrastructure is formed, rural communities live, people of the city and foreign tourists looking for a quiet rest come, etc. Therefore, the services provided by local ecosystems should be treated as opportunities for the development of activities in suburban, remote, and protected areas, etc. It has been noticed that the importance of agriculture as the main economic activity of the rural population is changing in Lithuania as well as in other European countries. The rural population is forced to look for additional activities to replenish financial resources. Place-based communities are struggling to maintain their connections to land and water, including the social and cultural practices that are rooted in a particular landscape [13]. The prevailing opinion is that the need for diversification of economic activities in the 21st century is determined by such factors as social (emigration of young people, aging farmers, rising unemployment, quality of life gap between urban and rural areas), economic (declining farm profitability, insufficient development of rural economic activities), political (financial mechanisms to promote farm diversification in rural areas), geographical (landscape, land-use productivity, infrastructure), etc.

According to research data [14–19], more and more rural residents would like to diversify their economic activities by creating additional sources of income in addition to agricultural activities, gradually abandoning them altogether. These statements are confirmed by the EU's goal to increase the income of the rural population from non-traditional agriculture or alternative activities to agriculture. The implementation requires not only financial support but also the motivation of the rural population itself; therefore, gradual abandonment of intensive farming raises the following question: what alternative activities can be chosen with available resources? Rural tourism is recommended as one of the forms of activity, promoting tourism business, increasing the variety of services, for a citizen or foreign guest vacationing in the countryside. It should be emphasized that tourism services should help to address social, economic, and environmental problems by providing an alternative source of livelihood for the rural population and helping to preserve the natural values associated with the preservation of ecosystems.

Based on the Convention for the Protection of the World Cultural and Natural Heritage in the United Nations Agenda 2030 for Sustainable Development, the Recommendations On The Historic Urban Landscape, Comprehensive Plan of the Territory of the Republic of Lithuania—Vision for 2050 [20–22], assessing cultural heritage through the historical landscape (including associative natural) and socio-cultural dimensions, CES were chosen as the research object, updating nature, heritage and traditions, looking for opportunities to increase accessibility and attractiveness of cultural heritage objects, preserving and meaningful cultural heritage sites in a specific area.

The solution to this problem requires the help of certain specialists and strategists (tourism business, marketing, nature protection, etc.), identifying disturbances in the development of a particular area and providing recommendations on the most efficient methods of joint efforts to develop services in the rural areas. A lack of cooperation between institutions and businesses is one of the main problems. Although the owner of a rural tourism homestead is likely to list valuable natural objects nearby, he or she can rarely offer a wide range of entertainment for a tourist for a long weekend or the whole week. Similarly, nature conservationists often shrug their shoulders when asked why so little information about their cognitive, cultural tourism and other events and activities is available to tourists. They often reply that they are not responsible for marketing.

The ecosystem is the complex and dynamic combination of plants, animals, microorganisms, and the natural environment that coexist as a whole and depend on each other. Ecosystem functions “become” services when a socio-economic interest arises, i.e., when a function is identified as having “benefits” (human mental and physical health, social life, the satisfaction of general needs, etc.) and “value” (economic, social, health, etc.). Human activities (or drivers of change) can have direct (e.g., climate change) and indirect (e.g., demographic change) impacts for human well-being on both ecosystems and human well-being. Human wellbeing can also influence indirect drivers of change, e.g., demographic situation, technological progress, social change, etc. According to De Bello et al. [23], the benefits of ecosystems can be perceived and incomprehensible. Perceptions of the value of an ecosystem are experienced (felt) and the benefits of the ecosystem to people in the local context are recognized. For example, microclimate regulation services provided by a city park is clearly felt by a person in that place.

Ecosystem services can also be understood as an interface between people and nature, which is illustrated by the so-called cascade model [6,24–26]. This model describes the causal interrelationships between ecosystems on one side and human well-being on the other. In this model, ecosystems are described through their biophysical structures and processes. Biophysical structures can more easily be called habitat types (e.g., forests, wetlands, meadows, etc.) and processes are the dynamics and relationships that form the ecosystem (e.g., primary production). Ecosystem functions in the context of a cascade model can be understood as features or behavior of ecosystems that support their capacity to provide ecosystem services (i.e., the ability of forests or grasslands to generate permanent biomass stocks). These elements and features required for the capacity of ecosystems to provide services are sometimes referred to as “supportive” or “intermediate” services, and “final” ecosystem services are what we can harvest as “harvested” (e.g., hay, timber, etc.) or benefits of ecosystems (e.g., flood protection, beautiful landscape, etc.). End-to-end services directly contribute to people’s well-being through benefits (e.g., health and safety). People are accustomed to attributing some value to such benefits for the benefits they receive. As a result, benefits are often referred to as goods or products, and value can be expressed in monetary terms, but also in moral, aesthetic, or other qualitative criteria.

Several different typologies and approaches have been developed to categorize ecosystem services, using different criteria such as spatial characteristics and scale, service flows, service recipients (private or public), type of benefit received (used or not used), and whether the service is used. As well according to whether the services are used for one person or group affects the ability of others to use them (competitive and non-competitive). One way to classify ecosystem services is to raise public awareness of the benefits of

ecosystems to humans. This approach was also the basis of the Millennium Ecosystem Assessment [16] classification system. This method of classifying ecosystem services consists of four main categories of ecosystem services: supply services—food, materials, and energy, i.e., things that people can use directly, supporting services—the ecosystem processes and functions on which the types of services are based, regulatory services—services by which ecosystems regulate the environment and its processes, cultural services—services that are related to the cultural or spiritual needs of people.

CES are most often associated with tangible and intangible ecosystem services, meeting the diverse cultural, social, and emotional needs of people. Recreation, inspiration found in nature, aesthetic, spiritual satisfaction, traditions, connection with place—these are the most important and the easily understandable values provided by nature.

Scientists argue that CES arise only from the perception of people, and cultural services would not exist without human perception of one or another benefit. They are intangible, so they are influenced by people's understanding and activity priorities. In principle, as Fish et al. [11] notice, CES provide a way in which the cultural dimension of ecosystem contributions to human well-being can be utilized in decision making through standardized comparison with all other ecosystem services. As well, the highly interdisciplinary and socially constructed nature of the ES framework invites a series of ontological and epistemological challenges [27]. According to Hirons et al. [28], the intersections between nature, culture, value, and politics are extremely complex. Despite being intangible, subjective, and difficult to measure, as Tandarić et al. [29] notice. Thus, the CES field provides a methodological framework for identifying the “non-material” services that ecosystems can offer to people, such as aesthetic values, educational values, or tourism and recreation possibilities [30].

It's important to notice, that some practical site-specific CES assessment studies choose to examine those ecosystem services that are most characteristic for the study area, without seeking to account for absolutely all aspects of ecosystem services [31–37].

Researchers [8,30,38] note that the intangible benefits that ecosystems provide to humans are mostly studied in the field of CES. Human perception and valuation change for many reasons and in a variety of ways. There is a growing concern that the ecosystem services approach emphasizes the optimization of a small number of services, which may endanger environmental sustainability. It can be observed that the range, intensity, and selection priorities of CES used are among the most important parameters of the use of services. The above-mentioned parameters demonstrate the territorial distribution of services, supply (potential), current volume, quality, and possible threats to the quality of services and the possibilities of providing services in the future [24,26]. According to Wang et al. [39], recreation is found to be both a way of experiencing CESs and a component of CESs. Therefore, recreation, inspiration found in nature, aesthetic, spiritual satisfaction, traditions, connection with place—for many people these are the most important and easily understandable values provided by nature and considered as CES. Analyzing the function of CES, such as aesthetic evaluation and cultural inspiration, it should be emphasized that the changing motives of people to travel may influence the increased interest in folk and inherited archaic culture and traditions (old houses, their decoration, ornamentation, interior, etc.). Therefore, efforts are necessary to involve travelers in the process of cognition of the country's culture, highlighting agritourism and the importance of visiting ecological homesteads.

It seems important to mention, that Lithuania-neighboring countries also carry out research in CES. Beichler [40] discusses the case study on CES in an urban region on the Baltic Sea coast; Veidemane et al. [41] examine marine ES approach; Giedych and Maksymiuk [42] analyze the specific features of parks and their impact on regulation and CES Provision in Warsaw, Poland; Müller et al. [43] discuss their importance of CES and biodiversity for landscape visitors in the Biosphere Reserve Swabian Alb (Germany), etc. The ability of ecosystems to adapt to the changing conditions may reduce potential damage; some benefits may even be gained from new possibilities provided by the climate. Still,

when planning the methods of adaptation, one must not forget that there are no universal adaptation measures that would be suitable for the entire territory of the European Union (hereinafter—the EU) because different measures are used under varying local conditions. For this reason, in order to determine effective impact measures for the preservation of ecosystems and the services they provide, research must be conducted on the adaptation of human activities to the ecosystem services in a specific location.

## 2.2. CES Challenges and the Case of Lithuania

Due to the natural diversity, landscape, and clean and safe environment, Lithuania has a favorable potential for the development of nature tourism. With increasing unemployment in rural areas, it is suggested to link the development of rural areas (settlements) with the identification, strengthening, and development of their internal functional connections (strong communities, internal services) and external connections (services for urban centers, for ecologically important areas). Strong communities in many cases would be a key condition for the viability of rural areas, creating opportunities for activities that would be an alternative to the declining number of workers in the agricultural sector. It can be emphasized that the immovable cultural heritage and related infrastructure in agricultural areas should be developed by overcoming it, applying the principle of “storage through use” [44].

It can be noticed that there are a number of cultural heritage objects in Lithuania, but when assessing the country’s tourist areas, the emphasis should be placed on those objects that would be interesting for both local tourists and guests from abroad, representing the country’s culture, history, biological and landscape diversity. For example, in rural areas, a large part of the list of attractions includes churches, crosses; at the local level, these are significant historical religious, memorial objects, valuable from the point of view of the region, cognition of the place, historical memory. However, from the point of view of tourist attractiveness, these objects are seldom visited because information about them is either not available or the information is presented in a sufficiently primitive way and is of no interest to visitors.

As experts [45–48] note, tourist brochures or guides suggest tourists (especially in the regions) visit churches, but village and town churches are usually only open during the services (early morning and evening) and are therefore not open to visitors at any time. Some of them are architecturally interesting, but most of them have no greater cognitive value. In some churches, movable cultural heritage values (paintings, tombstones, sculptures, altars, church utensils, etc.) have survived but they are not exhibited. If they are to be exhibited, the protection of values should be ensured, which is difficult to do in rural churches.

It has been established that the websites of municipal administrations, elderships, tourist information centers, national and regional parks often offer dilapidated manor houses or homestead parks as places of interest. However, no one is waiting for a tourist in the former manor houses or parks, there are neither information nor tourism services. Therefore, very often manor homesteads in rural areas should be treated only as potential objects of tourism services to be developed, but today they do not provide any financial or cultural benefit.

The prevailing opinion is that most cultural and natural heritage sites are interesting from a scientific and cognitive perspective but are unattractive from the tourism organization’s point of view. For example, a list of cultural heritage monuments is dominated by mounds, burial mounds, and cemeteries, ancient villages. Once all the Lithuanian mounds have been arranged, they would become a unique part of the landscape. However, today a traveling tourist could see only a few of them in detail, and the preparation of cultural heritage monuments for a visit is very different. Most of them do not provide any services (catering, excursions, souvenirs, information).

It has been noticed that many natural monuments are inaccessible, i.e., they are far from roads (in the middle of forests) or accessible only by water (hydrographic), or



difficult to prepare for visits (exposures). For example, 30% of the proposed geological, hydrogeological, geomorphological, hydrographic, and botanical objects have a status of natural monuments but only 18% are ready for visiting.

Protected cultural heritage objects with the status of a monument, dissemination of national and regional parks, and protected landscape objects with the status of a natural monument were also analyzed. In certain areas, it is possible to notice their compaction, to distinguish the chains of objects, etc. Where the chains of monuments are visible, there are no roads. Where there is a higher density of monuments, the road network is sparser. This is due to the fact that a large part of cultural heritage objects with the status of a monument are archaeological objects (mounds, alcoves, ancient villages, burial mounds). Their spread is related to ancient land and waterways. It seems important to mention the study of Lithuanian tourism potential assessment determining the largest tourist attraction areas and priorities for their use [49], where the prevailing opinion is that the Lithuanian landscape and biological diversity are best represented by national and regional parks. National and regional parks are the places of interest that protect the Lithuanian landscapes and have many individual objects of interest. In order to overcome the above-mentioned areas, the employees of protected areas were encouraged to look for ways and means, to adapt ecologically fragile areas to the needs of tourists. On the other hand, they are natural complexes, the life, and activities of which should not be disturbed by a large flow of tourists, especially those traveling by car. When activating the possibilities of nature tourism activities, it should be borne in mind that sustainable tourism should be carried out in the developing area, taking into account how tourism affects local nature and local communities. However, it is unfortunate that the concept of sustainable tourism in Lithuania is still little known, there are attempts to develop the tourism business in a sustainable direction, but this is rather an individual initiative than a trend [50–52].

According to forecasts, with the total annual flow of tourists growing by about 5.5%, the demand for nature tourism will grow six times faster. This will be determined by the improving living standards of the population of many countries, increasing life expectancy, interest in a healthy lifestyle as well as the growing urban population, concerns about the human impact on the environment, and other reasons. Popular nature tourism is very important and useful for Lithuania, which is famous for NATURA 2000 territories, unique landscapes, rare plants, bird watching, and other activities in nature [51]. It can be observed that the popularity of nature tourism requires more attention to the development of tourism infrastructure, improving the quality of products and services offered. In Lithuania, little attention is paid to the development of more diverse nature tourism services (focused on active and cognitive leisure). In naming the attractiveness of nature tourism services, it is necessary to emphasize the environment, as there is an opportunity to be surrounded by nature and stay away from the noise of the city and people. Cognitive opportunities must also be kept in mind as vacationing in the countryside provides perfect opportunities to get to know the local community, the culture, and the area.

The impact of CES is usually intangible, difficult to measure and quantify. As a result, CES is also treated differently by different people or by different organizations representing different sectors of activity, the so-called stakeholders, both natural and legal persons. As different typologies and methods have been developed for the categorization of CES, which use different criteria, the selection of CES for the survey was based on the classification (the Common International Classification of Ecosystem Services—CICES 5.1 [53], Table 1) and existing and potential resources in the study area.

**Table 1.** Chosen cultural ecosystem services (CES) from classification by CICES (Common International Classification of Ecosystem Services, version 5.1).

Division	Group	Examples of Services
Direct, in-situ, and outdoor interactions with living systems that depend on presence in the environmental settings.	Physical and experiential interactions with wildlife.	Ecological forest features, making them attractive for hikers; diving, swimming opportunities; birds, animals, that nature lovers can enjoy watching, etc.
	Intellectual and representative interaction with wildlife.	Protected areas, areas where volunteering can be done, scenic routes; areas of exceptional natural beauty, objects in nature that allow people to identify with the history or culture of their place of origin, etc.
Indirect, remote, often indoor interactions with living systems that do not require presence in the environmental settings.	Spiritual, symbolic, and other interactions with natural environment.	Oak, Stork (e.g., Serpent), etc., as worshiped animal and plant species in traditional Lithuanian culture.
	Other biotic characteristics that have a non-use value.	Protected wildlife areas, endangered species or habitats, etc.

Due to the large number of CES services, only eight concrete services were selected for the study, such as: provision of recreation and recreation in nature, cultural heritage, aesthetic significance, religious significance, striving to preserve existing natural values, nature and ecological tourism, sightseeing tours, nature observation, cognition service, providing recreational fishing opportunities, providing material for research and cognition. These services were selected on the basis of the existing and potential natural, traditional, and heritage resources of the area, seeking to preserve and enhance them, making them accessible and attractive for visitors.

### 3. Research Setting, Materials, and Methods

#### 3.1. Research Setting

During the research, the potential of CES in the Nemunas Delta and the Curonian Lagoon and in the ~10 km zone from the shore in the rural areas were assessed. The Nemunas Delta begins 48 km from the mouth (below Tilžė), where the Nemunas branch into Rusnė and Gilija branches. Rusnė begins 13 km from the mouth (at Rusnė Island) branches into Atmata and Skirvytė. The plain of the Nemunas Delta is still being changed by the branches of the Nemunas and the delta of the Minija, Šyša, Tenenis, Leitė, and other rivers that have joined the Nemunas Delta. As sediments continue to form at the mouth of the Nemunas, the Nemunas Delta is gradually increasing and moving towards the Curonian Lagoon [54]. The Nemunas Delta is well known for its great biodiversity and in 1992 the Nemunas Delta Regional Park was established in order to preserve its original landscape, and natural and cultural heritage [55]. The Nemunas Delta is one of the few places in Lithuania and Europe where large floodplains of swampy deciduous forests—habitats of European importance—can still be seen. Many rare bird species protected in Lithuania and the European Union breed in the forest and wetland complexes (black stork, eagle roost, winch, great crested grebe, etc.). The area of the flooded area is about 400 km<sup>2</sup>. The coast is characterized by spring and autumn—winter floods. Floods usually occur in the spring, when the Nemunas flows out of the banks. The spring floods in the lower reaches of the Nemunas begin at the end of March and reach their maximum level 6–8 days after the river flows out of the riverbed. Spilled water and ice destroy embankments,

floods settlements, destroys roads, quays, and brings fertile land to sediment. Floods cause a lot of damage every year. During the major floods, more than 1500 people are flooded, and the flood is approaching the entrances to the city of Šilutė [54]. The Nemunas Delta is very important due to its natural landscape, ecosystem values, and economic value [55]. According to Atkocevičienė et al. [56], Nemunas Delta Regional Park and its surroundings is the land of the heritage of Lithuania Minor with its special history, unique scenery, original ethnocultural, and valuable cultural heritage: Villages and homesteads of Lithuania Minor were of greater variety than in Lithuania Propria as there were no forced rural restructuring which had a great impact on the establishment and development of villages, thus ancient villages had been preserved in Nemunas Delta Regional Park until the post-war period. These villages may be grouped not only by location, and names, but also by lifestyle peculiarities of villagers [56].

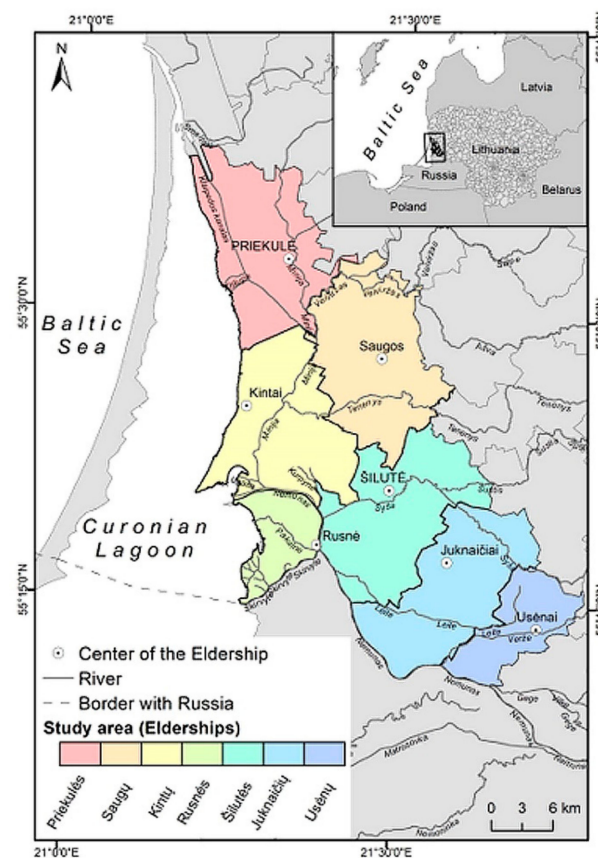
The Curonian Lagoon is the largest coastal lagoon in Europe with high nutrient loadings from the surrounding rivers [57], the large body of coastal water in the south-eastern is part of the Baltic Sea [58], and the 1584 km<sup>2</sup> coastal water body connected to the south-eastern Baltic Sea by a narrow (0.4–1.1 km.) strait, Klaipėda port area [59]. According to Jakimavičius and Kovalenkoviėnė [45], the Curonian Lagoon is the only and largest freshwater basin in Lithuania, a part of it belongs to Russia (1171 km<sup>2</sup>), whereas 413 km<sup>2</sup> is in the territory of Lithuania. The Curonian Lagoon is distinguished by its unique area, landscape, and fauna. During the development of Klaipėda State Seaport, the northern part of the Curonian Lagoon, connecting the lagoon with the Baltic Sea through a strait, was deepened; in addition, the quays have been reconstructed and newly built [60]. The authors [60] notice, that currently there are many discussions, debating the limits on the impact of natural processes and the anthropogenic impact. Therefore, there is a need to renew the water balance quotas of the Curonian Lagoon and global climate change, rising water levels may affect aquatic ecosystems [59].

Eldershops located near the Curonian Lagoon or within the protected area of the Nemunas Delta Regional Park were selected for the study. The following seven elder-shops were distinguished: Priekulė, Saugai, Kintai, Rusnė, Šilutė, Juknaičiai, and Usėnai (Figure 1).

For this purpose, the empirical study involved representatives of different (public and private) sectors and stakeholders. The main research was carried out in Kintai, Rusnė, Šilutė, and Dreverna tourism cultural centers (the main objectives of the tourism cultural centers are: to accumulate, preserve and popularize the spiritual and material values of ethnic culture and to adapt them to the needs of modern society; cultural tourism activities; to take care of the dissemination and popularization of ethnic culture; to educate, form the general culture of the society, to develop educational, non-formal education of children and adults, entertainment activities, to take care of the dissemination of professional art; to organize cultural activities in elder-shops [36]). Additionally, the research was carried out in Priekulė, Saugai, Kintai, Rusnė, Šilutė, Juknaičiai, and Usėnai elder-shops, with local elders and elder-shop employees, with farmers and with entrepreneurs.

The empirical study was carried out on the possibilities of adapting human activities to CES in the specific area, i.e., coastal-rural area, evaluating the past, present, and future CES potential in the Lithuanian coastal zone, Nemunas Delta and Curonian Lagoon in Lithuania.





**Figure 1.** Distribution of cultural ecosystem services (CES) potential in the study area according to the generalized Common International Classification of Ecosystem Services (CICES) classification (distribution map made by J. Mezine).

### 3.2. Materials and Methods

The following data collection and analysis methods were used in the research: document analysis, questionnaire, and comparative analysis.

**Document analysis.** Having considered the object of the research (ecosystem services) as well as the goals and tasks of the research, this method is considered to be the most important method of data collection (method used to obtain data). Data sources: national, EU and international legislation, scientific books, and journals, press publications; official statistics (information provided by the Department of Statistics, municipalities, elderships, departments of protected areas); official government publications; documents of private, state, professional and other non-governmental organizations.

**Questionnaire.** In order to evaluate the existing problems of ecosystem protection and their services, a survey of respondents (tourists, farmers, entrepreneurs, eldership employees) was conducted and their opinions on ecosystem conservation and possible related problem areas were investigated, and the peculiarities of CES regulation and implementation were revealed. The questionnaire examined the advantages and disadvantages of socio-economic conditions (related to current or potential CES). Based on the survey, the following insights into the management of CES were provided: Contingent valuation method and Consumer choice experiments. The contingent valuation method was based on a survey of the users of CES in regard to their priorities for ecosystem services. A hypothetical market for potential CES has been created. Consumers (tourists) were asked about specific actions of their own (the ones that can be done by them) and were also asked questions about actions taken to maintain or improve the status of ecosystems. During consumer choice experiments, consumers of CES (tourists) had to choose potential (in their opinion) operation alternatives related to CES by 2030.

Comparative analysis. The comparative analysis has allowed the researchers to reveal the differences and similarities not only in the practice of the phenomena (e.g., ecosystem (biodiversity) conservation) in Lithuania, but also in the examples of “good practice” in various countries. It was necessary to take a close look at/to empathize with another cultural perspective, learn to understand the thinking processes of another culture and see it from the inside rather than from the outside (through the insider’s eyes), as well as evaluate the research phenomena in the country through the eyes of the impartial observer.

Research participants. In order to evaluate the existing problems of ecosystem protection and their services, a survey with four group respondents (tourists, farmers, entrepreneurs, eldership employees) was conducted. Tourists were the ones who visited the mentioned centers (85 respondents), aiming to evaluate the past, present, and future CES potential. The distribution of respondents (tourists) by countries was as follows: 56% were tourists from Lithuania, 31%—tourists from the EU countries, 5% each, from the UK, Norway, Russia, and Ukraine, and 3% from the USA. Analyzing the assigning of tourists into certain classified tourist groups, it was found that the largest share (49%) was made up of holidaymakers, 21%—active recreation lovers, 8%—entertainers and adventure seekers. Furthermore, the research was carried out in Priekulė, Saugai, Kintai, Rusnė, Šilutė, Juknaičiai, and Usėnai elderships, with local elders and eldership employees (11 respondents), with farmers (64 respondents) and with entrepreneurs (15 respondents). All respondents had to assess the potential of CES. A score scale from 1 to 5 was chosen for the evaluation (1—the most significant, 5—low significance). CES samples were selected based on literature analysis and expert opinion, according to the types of ecosystems in the study area. In this way, eight examples of services of CES were selected (Table 1) according to the CICES 5.1. classification.

#### 4. Results

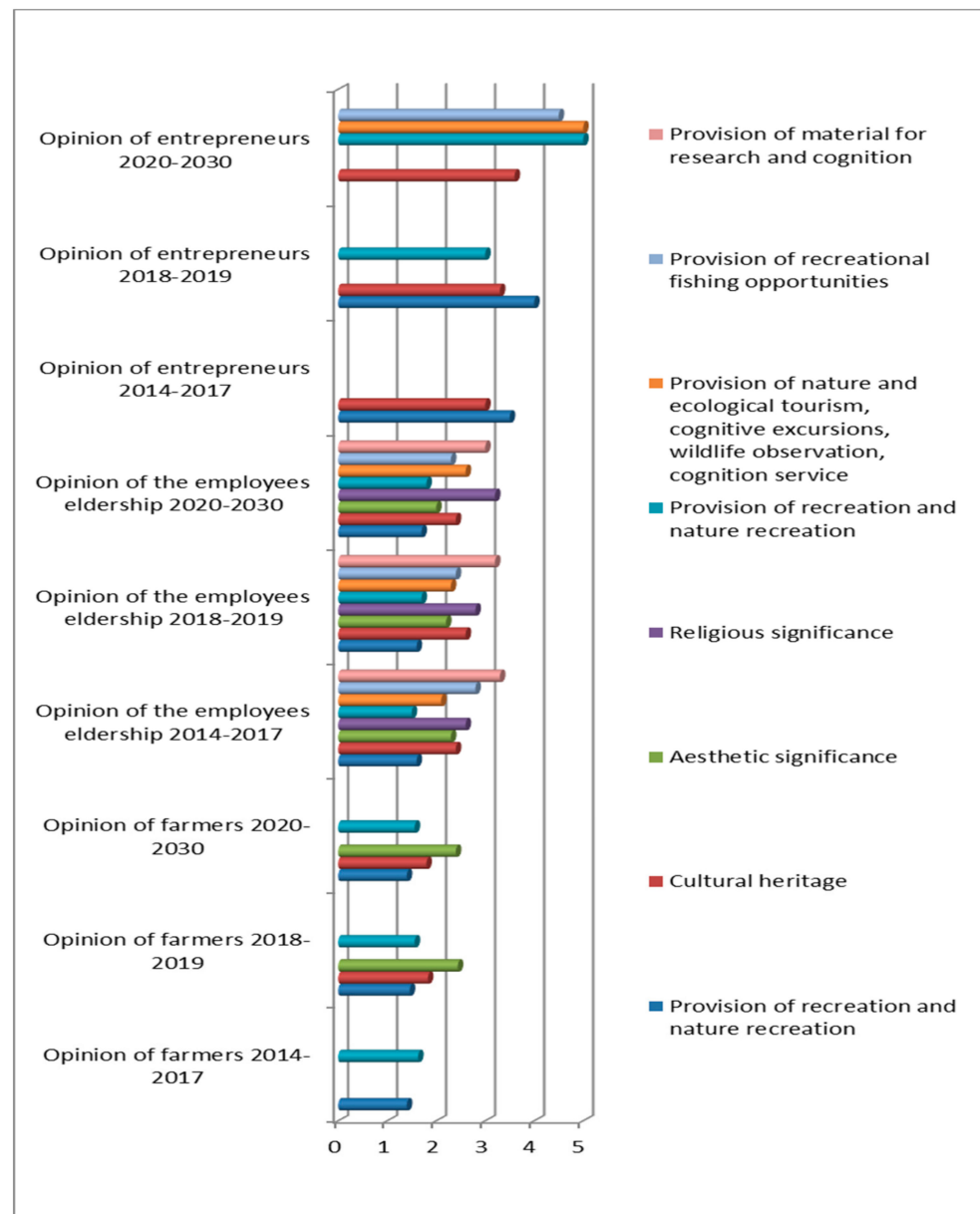
According to research data, there is almost no service infrastructure necessary for traveling tourists in Juknaičiai, Saugai, Usėnai, regardless of the category of tourists (natural, recreational, etc.) they belong to. Unfortunately, in the studied areas (except for Rusnė, Dreverna, and Kintai), rural tourism is sluggish, there is a lack of beaches, an underdeveloped network of respite, rest areas and campsites, and poorly equipped and marked cycling routes.

Assessment of the CES potential in the past, present, future. During the research (Figure 2), the respondents had to assess the potential of CES of the past (2014–2017), of the present day (2018–2019, because the research was conducted during this period), and of the future (2020–2030). When assessing the potential of CES respondents had the possibility to choose the priority services, as seen in Figure 2.

Analyzing the opinions of farmers, it was found that in all the studied periods the provision of CES recreation and recreation in nature dominated—change from 1.42 (2014–2017) to 1.4 points (2020–2030). Eldership employees (2014–2017) singled out the desire to preserve existing natural values (1.5 points), and in 2018–2019 and 2020–2030—the provision of recreation and recreation in nature, 1.6 and 1.7 points, respectively. Entrepreneurs named the cultural heritage of CES change from 3 to 3.6 points in all study periods.

The survey also analyzed the opinions of respondents (both farmers and entrepreneurs) about the measures of public authorities that can help to preserve the provided CES, such as educational activities on natural topics (1.33 points), maintenance, preservation of cultural heritage, etc. (1.5 points), installation of information stands (1.66 points), stocking of water bodies (3 points).

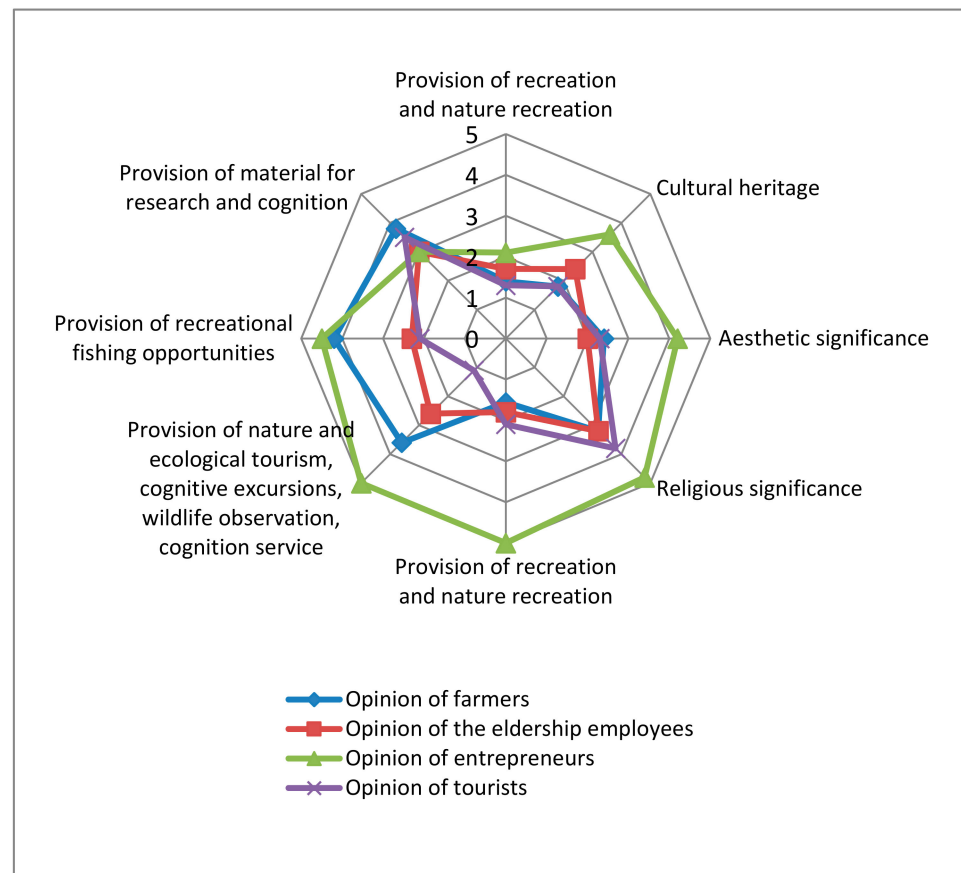
Views on the future potential of supply CES. Analyzing the potential of CES (2020–2030) (Figure 3), in the opinion of farmers, the most significant services are as follows: provision of recreation and relaxation in nature (1.4 points), cultural heritage (1.8 points), aesthetic significance (2.4 points) and the desire to preserve the existing natural values (1.56 points).



**Figure 2.** Respondents' assessment of the potential of CES of the past (2014–2017), of the present day (2018–2019), and of the future (2020–2030).

According to business representatives, the priorities are as follows: cultural heritage (3.6 points), provision of recreational fishing opportunities (4.5 points), preservation of the existing natural values and natural and ecological tourism, cognitive excursions, observation of wildlife, and provision of cognitive services (each 5 points).

According to the employees of the eldership, the main attention should be paid to the provision of recreation and relaxation in nature (1.7 points), the desire to preserve the existing natural values (1.8 points), and the services of aesthetic significance (2 points). Meanwhile, tourists gave priority to nature and ecological tourism, cognitive excursions, nature observation, cognitive services (1.1 points), recreation and relaxation in nature (1.3 points), cultural heritage (1.8 points), and the desire to preserve the existing natural values (2.1 points).



**Figure 3.** Respondents' views on the future (2020–2030) potential of supply CES, in score averages.

It was found that 52% of tourists visited protected areas (national and regional parks) for cognitive purposes. These data show a strong interest of tourists in learning about wildlife, biodiversity, natural landscapes and at the same time demonstrate good potential for more intensive use of these CES in the future, especially if (thanks to the study) the infrastructure of the study area for sustainable nature and ecological tourism, excursions and wildlife observation is improved. For example, wetlands were mentioned by as many as one-fifth of respondents (27%) as the most frequently visited habitats for nature cognition purposes. Undoubted results were obtained during the study due to the importance of the infrastructure adapted for visiting nature—75% of tourists said it is important for the infrastructure to be adapted to the visited areas (educational trails, towers, stands, etc.).

Summarising the data of the study, it can be observed that the provision of outdoor recreation services in the analyzed area could have a high potential for use if the use was stimulated by infrastructural means and combined with other CES. A quarter of tourists (25%) would and would like to go on recreational hikes in the natural environment, 45% would prefer to just relax, i.e., take a picnic or walk in the natural environment.

Potential CES future directions. The study found that entertainment and catering services are so far concentrated only in Rusnė, Dreverna, and Kintai, near the roads that can reach tourist areas, etc. In the areas, such as Saugai, Usėnai, and Juknaičiai, there are practically no centers of attraction, although the population is quite big and the unemployment rates (11.5%) are clearly higher than in the whole country. Locals prefer unemployment benefits instead. According to the representatives of business and elderships, the flows of tourists for the development of catering and accommodation services are too small and only seasonal; therefore, a variety of accommodation and catering services in the mentioned areas is small, whereas specialized services (by type of tourism) are minimal.

It can be noticed that agriculture in Lithuania has always been and will be the main economic activity of rural areas. People engaged in agriculture not only make a profit but also develop multifunctional agriculture, whose activities are not only focused on the production of raw food materials and fiber but may also have an impact on the employment, the landscape, the environment, biodiversity, and the preservation of traditions and heritage, ensuring the quality of food products, creating such services in the countryside that would become an attractive part of recreation for the residents of Lithuania and foreign visitors. These activities can support the vitality of rural areas by enabling farm owners to manage changes in the countryside. The research has revealed that rural tourism is not developed in Saugai, Usėnai, and Juknaičiai, and farming is prioritized in these areas. Therefore, it was asked whether tourists would agree to live on a farmer's farm, not as in a rural tourism homestead. Twenty percent would like to live as observers (observing what farm work and how the farmer is doing), and 41% would like to test their skills in temporary farming. In conclusion, 61% of respondents would like to try the service; however, such a service is not currently provided. It can be observed that farmers' farms could provide specialized services by offering agritourism products such as cow milking, berry picking, weeding, and other rural works. Therefore, for farmers living in researched areas, it is worth considering that they could have financial income from both the farm and natural resources (milk, butter, cheese, mushrooms, berries, fish sales, and outdoor entertainment, etc.). It should be noted that the provision of CES (such as nature and ecological tourism, nature observation, etc.) could contribute to the improvement of the socio-economic climate in the region. Tourist packages could also be identified as rural development opportunities, by cooperating with the services of individual adjacent homesteads or other objects/entities, for example, one homestead provides accommodation services, another—catering, the third would be responsible for the leisure time of the tourist on vacation, etc. Unfortunately, tourist packages are not composed in the study area to increase the number of visitors.

After evaluating empirical research (questionnaire) results, Table 2 describes the predicted vectors for the use of selected potential CES and possible change.

**Table 2.** Forecasted vectors of the use of selected potential CES and of possible change.

Examples of Types of Supply Services	Vector of the Change in the Intensity of Use (2020–2030) <sup>1</sup>			
	Opinion of Farmers	Opinion of Entrepreneurs	Opinion of the Eldership Employees	Opinion of Tourist
Cultural heritage	↑	↑	↑↑	↑↑
Aesthetic significance	↑	↑	↑↑	↑↑
Provision of material for research and cognition	↑	↑	↑↑	↑
Aspiration to preserve existing natural values	↑	↑	↑↑	↑↑
Provision of nature and ecological tourism, cognitive excursions, wildlife, observation, cognition service	↑↑	↑↑	↑↑	↑↑
Provision of recreation and nature recreation	↑↑	↑↑	↑↑	↑↑
Provision of recreational fishing opportunities	↑	↑	↑	↑
Religious significance	↔	↑	↑	↑

<sup>1</sup> ↑↑—significant increase in the use of CES; ↑—increase in the use of CES; ↔—changes in the intensity of use of CES without a clear trend.



It should be pointed out, discussing the forecasted vectors, based on opinions of the eldership employees, the strongest future intensity is seen almost on all suggested types of supply services (except only the provision of recreational fishing opportunities and religious significance). Based on opinions of tourists, the strongest future intensity is found on five suggested types of supply services (except the provision of recreational fishing opportunities and religious significance, provision of material for research and cognition, and religious significance). Based on opinions of farmers and entrepreneurs, the strongest future intensity is seen only in two suggested types of supply services (provision of nature and ecological tourism, cognitive excursions, wildlife, observation, cognition service, and provision of recreation and nature recreation).

The studied forecasting of the Lithuanian CES began only a few years ago. So far, it is of a general overview in nature, extrapolating to the general trends taking place in the European Union. There is little systematic data at a national level, so this study would contribute to better decision-making in identifying which CES are missing and which CES provision is deteriorating. Improving the provision of these services would allow Lithuania to avoid economic losses in the future by planning various sustainable activities and seeking nature preservation. Furthermore, this research results in insights that would contribute to future CES development.

## 5. Discussion and Recommendations

It should be emphasized that the development of rural areas in different areas, due to different ecosystem structures, is often unequal. Differences are formed due to different natural and cultural resources, different infrastructural provision and services, different development of local socio-economic infrastructure. Therefore, in order to increase the tourist attraction, it is important to develop specific products by exploiting the advantages provided by local cultural resources, local socio-economic infrastructure, tourism infrastructure provision, and service development. These factors determine the need for new tourist products (creation of individual routes, trips to hard-to-reach regions, extreme trips) and the emergence of products (demand for culinary, historical, folklore, literary, etc. routes). New tourist routes should emphasize their authenticity and educational aspect, look for unused spaces for tourism, attracting local craftsmen, farmers and entrepreneurs, offering original products and services in line with local traditions [61,62]. The tourist of the 21st century is characterized by greater individualism, a desire to spend his or her free time in a different way, and to discover the pleasures provided by an authentic environment. It is noticeable that the “three S” (sun, sand, sea) alone is not enough for a modern tourist, he or she is looking for new challenges and new regions. This is called the search for the “three Es” (entertainment, excitement, education) [38]. It can be observed that, unlike other ecosystem functions such as regulation or supply, the impact of CES is usually intangible, difficult to measure, and quantify. As a result, CES is also treated differently by different people or by different organizations representing different sectors of activity, the so-called stakeholders, both natural and legal persons. For example, an environmentalist knows that it is important to preserve ecosystems, while the average person wants to make the most of the good that ecosystems provide. Therefore, the mass involvement of stakeholders, their participation, and the representation of different perspectives are very important in the process of assessing and preserving the potential of CES.

In different areas, the development of rural areas due to different ecosystem structures usually takes place differently. Differences are formed due to different natural and cultural resources, different infrastructural provision and services, different development of local socio-economic infrastructure. Therefore, in order to increase the tourist attraction, it is important to develop specific products using the advantages provided by local cultural resources, local socio-economic infrastructure, tourism infrastructure provision, and service development. The provision of CES (such as nature and eco-tourism, nature observation, etc.) could contribute to improving the socio-economic climate in the region. Tourist packages could also be identified as rural development opportunities, by cooperating

with the services of individual adjacent homesteads or other objects/entities, for example, one homestead provides accommodation services, another—catering, the third would be responsible for the leisure time of the tourist on vacation, etc. Unfortunately, tourist packages are not composed in the study area to increase the number of visitors.

It should be noted that not all people who leave the agricultural activity will set up rural tourism homesteads, so there is a need for certain action programs that would bring additional income to the population in a particular area, combining the existing infrastructure, cultural heritage, experience, history, etc. As one of the alternatives, it would be possible to recommend a cultural and cognitive path enabling and empowering local cooperation. A cultural path could connect these areas with a specific theme, which means that a story on the chosen theme could be told throughout the journey. The theme should be selected and developed by multi-sectoral expert groups from different localities, revealing the area's history and heritage in the field of cultural tourism and sustainable cultural development. Its specificity would be determined by the geographical, cultural, historical and natural environment features of the areas, the interrelated elements of tangible and intangible heritage. This should use the information on the living environment, interest groups, local resources, and key characters in the area. The cultural and cognitive route would include not only visits to famous places (of participating elderships) but also cultural services provided by forest, meadows, and river ecosystems (e.g., recreation, knowledge of nature, active or passive sports, observation of plants, birds and animals in their natural environment, admiration of natural beauty, sensory-cognitive education, etc.).

Combining or classifying all the above activities according to the age groups, physical fitness, or preferences of the visitors. The following key activities are recommended:

Active recreation in nature (including cycling in the warm season—cycling paths; water sports—kayaking, canoeing; extreme sports (such as hot air ballooning), horseback riding and hiking (active cognitive hiking, including visiting various cognitive sites, health trails), in winter—active skiing or sledding; organization of orienteering competitions).

Passive recreation in nature—cognitive recreation in nature (including recreation in rural tourism homesteads; visiting various nature objects; amateur fishing; observation of plants, birds, and animals—their calculation, description, identification; landscape observation; nature walks and enjoying spiritual experiences; berry picking, mushroom picking as well as various meditation and educational programs such as sound education—to single out, count the sounds heard in nature and to recognize and describe them; smell and color education—to collect a bouquet of forest or meadow plants and describe the colors and smells; forest tree therapy—choose a forest tree and create your own story about that tree; tasting and educational programs of the traditional culinary heritage of those areas, various nature camps, artists' residences, etc.).

Taking into account that one-day recreational cognitive tours are the most popular in Lithuania, it is proposed to combine these activities, i.e., to combine active recreation in nature with passive recreation in order to obtain the greatest possible physical satisfaction in regaining spiritual balance.

It should be emphasized that the organization of activities should include eldership communities and villagers. It is recommended to use certain incentives (depending on the funding requirements and funding period) for the implementation of these activities, such as support for rural development (support for economic start-ups in the rural areas, agri-environment and climate, organic farming), support for local projects, support for beekeeping, direct payments, projects funded by the Culture Support Fund (such as ethnic culture and cultural heritage, artists' residences, cultural education, balanced cultural development, etc.) and to use the aid in order to activate local tourism.

In order to promote the viability of the activities of elderships, it is necessary to keep in mind the more diverse ways of presenting the information. Information should be disseminated through tourism information centers, in cooperation with tourism information centers in the country and in other foreign countries, tour operators, and other entities. The following digital marketing for information dissemination should be used: Internet,

social networks, digital advertising, and mobile apps. It is necessary to create visually appealing websites with information about the services provided (a detailed description, photos, reviews), prices, maps, and links on how to get there and how to contact the service providers. Information should be provided not only in Lithuanian but also in foreign languages, such as English, German, French, Russian, Polish, etc. The information should be made publicly available to as wide a circle of individuals and organizations as possible. This requires the use of social networks such as F, videos on the Y channel. These social networks would provide direct access to consumers. As positive feedback on the services received and the sensations experienced has a very significant impact on attracting visitors, it is appropriate to broadcast these reviews using social media as widely as possible.

In summary, it should be noted that the potential of CES depends and will depend on different ecosystems and their condition. It is clear that the deterioration or even disappearance of those ecosystems will reduce their ability to provide these services. Even when it seems that something is gained with environmental degradation, it is important to keep in mind that even more will be lost. According to Chan et al. [63], the collective effort would help scholars and decision-makers incorporate relational values in their work and better understand how we can collectively and individually move towards more just and sustainable relationships involving nature. Only by understanding and assessing the real potential of the services provided by ecosystems will it be possible to make appropriate, environmentally friendly decisions.

## 6. Conclusions

The range, intensity, and selection priorities of CES used are among the most important parameters for the use of services. The mentioned parameters demonstrate the territorial distribution of services, supply (potential), current volume, quality, and possible threats to the quality of services and the possibilities of providing services in the future.

Thus, seeking to understand the coherence between human and ecosystems, ensuring the social and economic well-being of present and future generations in the context of CES, the research was carried out on the possibilities of adapting human activities to CES in the specific area, in the coastal-rural area, Nemunas Delta and Curonian Lagoon, Lithuania. The research revealed the past and the current situation of CES potential and showed the possible CES potential future development directions.

For this purpose, the empirical study involved representatives of different (public and private) sectors and stakeholders. In order to evaluate the existing problems and future potential of CES, the research was carried out in local tourism cultural centers and elderships with four group respondents: tourists, farmers, entrepreneurs, eldership employees. Due to the large number of CES services, only eight concrete services were selected for the study, such as: provision of recreation and recreation in nature, cultural heritage, aesthetic significance, religious significance, striving to preserve existing natural values, nature and ecological tourism, sightseeing tours, nature observation, cognition service, providing recreational fishing opportunities, providing material for research and cognition. These services were selected on the basis of the existing and potential natural, traditional, and heritage resources of the area, seeking to preserve and enhance them, making them accessible and attractive for visitors.

The research showed that, based on the opinion of the eldership employees, the strongest future intensity is seen almost on all suggested types of supply services (except the provision of recreational fishing opportunities and religious significance). The organization of activities could include eldership communities and villagers who provide a range of services (e.g., stories about the village, its history, objects visited or observed (e.g., baker, beekeeper, a naturalist with his or her activities or monitored activities), folklore ensemble with the customs of that region; accompanying visitors or hikers to their chosen object). It is recommended to use certain incentives (depending on the funding requirements and funding period). Creation of a cultural and cognitive path (so far not at the international but at the local level), enabling and empowering (Rusnė, Dreverna

Kintai, Saugai, Usėnai, Juknaičiai elderships) cultural, educational, heritage and tourism cooperation is recommended as one of the program proposals.

Based on the opinion of tourists, the strongest future intensity was found on five suggested types of supply services (except the provision of recreational fishing opportunities, provision of material for research and cognition, and religious significance). The provision of outdoor recreation services in the analyzed area could have a high potential for use if the use was stimulated by infrastructural means, combined with other CES, although today too little attention is paid to the development of nature tourism services (focused on active and cognitive spending). The high interest of tourists learning about wildlife, biodiversity, and natural landscapes demonstrates good potential for more intensive use of these CES in the future, especially if (thanks to the study) the infrastructure of the study area for sustainable nature and eco-tourism, excursions, and wildlife observation is improved.

Based on the opinion of farmers and entrepreneurs, the strongest future intensity is seen only in two suggested types of supply services (provision of nature and ecological tourism, cognitive excursions, wildlife, observation, cognition service, and provision of recreation and nature recreation). Thus, farmers could provide specialized services in their farms by offering agritourism products such as cow milking, berry picking, weeding, and other rural works. Therefore, for farmers living in the researched areas, it is worth considering that they could have financial income from both the farm and natural resources (milk, butter, cheese, mushrooms, berries, fish sales, and outdoor entertainment, etc.). Residents who have retired from intensive agricultural production activities need certain action programs that would bring additional income by combining the existing infrastructure, cultural heritage, experiences, history, etc.

Hence, to conclude this article, Kieslich and Salles [64]'s ideas come in useful: according to them, further research is expected to contribute to the identification of opportunities to enhance dialogue and collaboration among scientists, decision-makers, and practitioners, notably through science-policy interfaces.

**Author Contributions:** Conceptualization, L.M. and R.P.; methodology, L.M. and R.P.; data curation, L.M. and R.P.; writing—original draft preparation, L.M. and R.P.; writing—review and editing, L.M. and R.P. All authors have read and agreed to the published version of the manuscript.

**Funding:** This research received no external funding.

**Institutional Review Board Statement:** Not applicable.

**Informed Consent Statement:** Not applicable.

**Data Availability Statement:** MDPI Research Data Policies.

**Conflicts of Interest:** The authors declare no conflict of interest the results.

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