VYTAUTAS MAGNUS UNIVERSITY AGRICULTURE ACADEMY

# Opportunities for Ecosystem Services in the Protected Areas in the Coastal – Rural Area of the Nemunas Delta and the Curonian Lagoon

**Lina Marcinkevičiūtė, Rasa Pranskūnienė**
Vytautas Magnus University, Lithuania
***Contact e-mail:*** *rasa.pranskuniene@vdu.lt*

UNECC University Network of the European Capitals of Culture

## Introduction

Ecosystems can provide a wide range of services that are critical to human well-being, health, subsistence, and survival. Examining the coherence between humans and ecosystems, ensuring the social and economic well-being of present and future generations in the context of ecosystem services (ES), this article seeks to present empirical research carried out on the possibilities of adapting human activities to ecosystem services in a specific area; namely, a coastal – rural area in the Lithuanian coastal zone, Nemunas Delta and Curonian Lagoon in Lithuania, seeking to offer opportunities with the rapidly declining population to operate services of ecosystems. Thus, 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 centres and elderships with four group respondents (tourists, farmers, entrepreneurs, eldership employees). The research revealed that development of nature tourism could provide a lot of benefits for the region; after discovering the links between farming and nature tourism, possibilities would emerge to promote local farmers' production by selling, not the raw materials, but already processed production, which has greater added value. The aforementioned tourist development ideas, especially in the ecologically vulnerable region, would enable the protected areas' employees, local farmers, businesspeople, and municipal employees to seek new methods to adapt ecologically vulnerable areas for tourist needs without damaging the eco-systems.

## Methodology

The elderships chosen for the research are the ones that are located in the zone within about 10 km of the coast in the Nemunas Delta and the Curonian Lagoon and that are within or bordering with the area of the Nemunas Delta Regional Park. Most of the territories of Šilutė District are in the lowlands of the Lithuanian seaside. The lowest location is Rusnė island (which is, in places, even below the sea level). Every spring and often in autumn, Nemunas floods large areas of Šilutė District (about 400 km²), cutting off transportation (Figure 1).

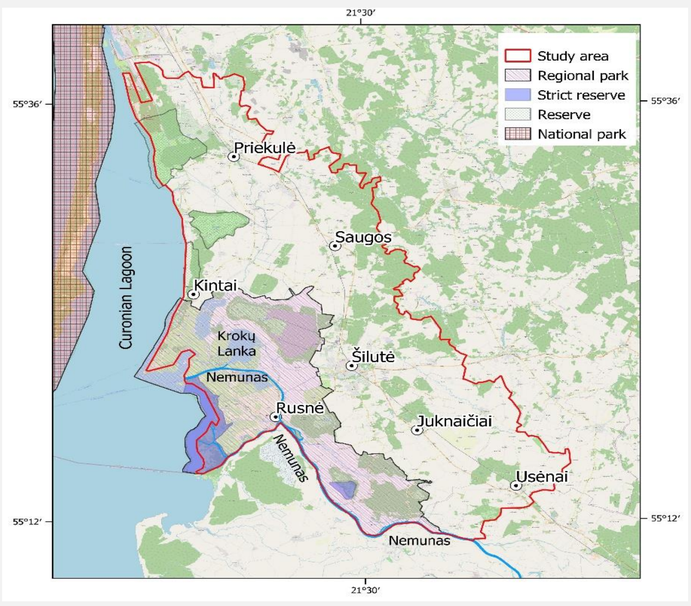


***Figure 1****. Study area and its location on the map of Lithuania, 2021 (distribution map made by D. Gozdowski).*

In order to solve the existing problems of the protection and services of ecosystems, 4 versions of questionnaires have been prepared (for farmers, entrepreneurs, eldership employees (in Lithuanian) and tourists (in Lithuanian, Russian and English). Not all potential respondents agreed to participate in the survey, therefore the target general populations were: 180 farmers, 20 entrepreneurs, 15 employees of the eldership. Sample size finite population Cochran's assumption were: 47 farmers, 10 entrepreneurs, 8 employees of the eldership, and real sample sizes were: 64 farmers, 15 entrepreneurs, 11 employees of the eldership and 89 tourists. Thus, a total of 64 farmers, 15 businesspeople, 11 eldership employees and 89 tourists were questioned. Respondents were targeted to reflect the entire existing totality of the existing area. The survey was conducted in June–August 2019.

## Main conclusions

Development of nature tourism could provide a lot of benefits for the region. It could potentially encourage preservation, further maintenance, and support of valua-ble natural ecosystems, as well as promotion of farmers and their local production. Af-ter discovering the links between farming and nature tourism, possibilities would emerge to promote local farmers' production by selling not the raw materials, but al-ready processed production, which has greater added value. The uniqueness of the services could help support the rural areas' vitality while providing the farm owners with the possibilities to manage changes in the villages. The supply of additional ser-vices would extend the tourism season and reduce seasonality, as the principal tourist flows are observed only from May until the end of September. The study area is distinguished by the wonderful nature, unique landscape, cul-tural heritage objects, interesting people who have something authentic to share. Tired of the constant rush, longing for slow life, slow rest, slow food, 50–60-year-old educat-ed tourists are looking for uniqueness and authenticity.

## Results

During the research, the evaluation of the priorities of the aforemen-tioned ecosystem service groups conducted and the significance of specific ecosystem service types was determined (insights of all three respondent groups) for the future in 2020–2030. After structuring research data, three examples were chosen from each type of ecosystem services that were most frequently chosen and given the highest scores by all three groups (farmers, entrepreneurs, and eldership employees). In the category of provision services, the following were selected: food of plant origin (1.7); food of animal origin (2.1); game (2.3). In the category of regulatory and support ser-vices, the following were selected: containment, utilisation and detoxication of waste and wastewater (1.3); regulation of water quality cycle (1.5); and air quality regulation (2.5). In the category of cultural services, the following were selected: provision of recreation and rest in nature (1.4); the aim to preserve the existing natural values (1.6); and cultural heritage (1.8) (Figure 2).

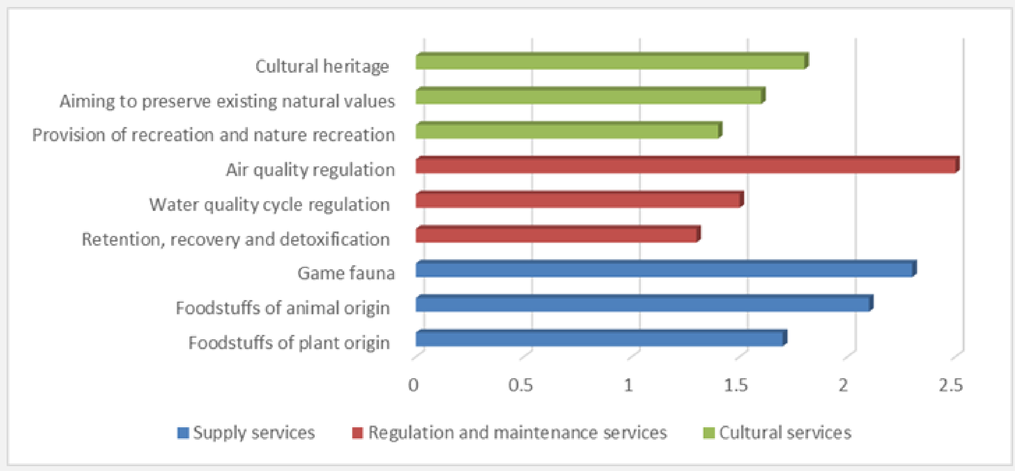


***Figure 2.*** *The respondents' opinions on prioritizing ecosystem services (score of 1 was given the strongest significance, while 3 was assigned low significance).*

When analysing the prioritised provision services selected by the respondents (products of plant and animal origin), it must be emphasised that Lithuania is most well-stocked with cereals and cereal products (401 percent), beef and veal (295 per-cent), and dairy products (145 percent). It is the least well-stocked with fruit and berries (25 percent) and vegetables (62 percent).

In the opinion of the respondents, traditional agricultural activities (producing cereals and rearing cattle) are, to date, the principal economic activities of rural areas. Small farms are managed and maintained by older people; therefore, it has been difficult for innovations to make their way in the sector, as they have experienced pushback. It is more difficult for smaller farms to attract investments in advanced technologies that are required for sustainable activities. Consolidation of Lithuania's agriculture should take place in the near future.

Understanding the impact of farming activities on ecosystems is beneficial for farmers themselves. By balancing the use of ecosystem services, there would be practically no waste left in the agro-ecosystem, and this would bring economic benefits. The activities of the aforementioned farms would influence the residents' employment, landscape, environment, biological diversity, and preservation of traditions and heritage, while ensuring quality of food products and creating services in the village that would become attractive to residents of different countries. The uniqueness of the ser-vices could help support the rural areas' vitality while providing the farm owners with the possibilities to manage changes in the villages. During the COVID-19 crisis, resilience to future pandemics and threats, such as climate change impacts, food shortages and disease outbreaks, would be strengthened through agricultural practices and wild-life protection.

While developing nature tourism, a demand would emerge of new service provision, which would make it possible to create new jobs in the area. Nature tourists ap-preciate the quality of services more, they also leave more money than usual tourists, establishing a target tourist market. Successful development of nature tourism would allow the region to set a priority direction of tourism and focus on it.