

Article

# The Cultural Ecosystem Services as an Element Supporting Manor Landscape Protection

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**Abstract:** Nowadays, agricultural landscapes of suburban zones may undergo rapid urbanization that destroys their identity. This phenomenon is particularly problematic for areas connected compositionally with historical residences. The aim of the research is to determine a framework for urban policies appropriate for cultural landscapes of agricultural origin associated with significant historic palace-garden complexes. As an example of such a landscape, the area around the historic Wilanów residence was chosen for study. The research focused on the degree of preservation of the agricultural surroundings of this historic site, the directions of contemporary urban policies towards it, and its potential to provide cultural ecosystem services to local residents and tourists. The research showed that the character of the landscape under study is changing—apart from cultivated fields, wastelands have appeared, indicating a gradual abandonment of agricultural use. The analysis of local spatial development plans confirmed that many fragments of the landscape are not sufficiently protected, which causes their degradation. The study of the potential of this area to provide cultural ecosystem services using statistical methods proved its many values: aesthetic, cultural, educational, spiritual, recreational, and touristic which predestine it to perform Urban Green Spaces and Informal Green Spaces functions. The research was compared to the findings of other authors, studying analogous landscapes. Based on our results, general guidelines were developed for further protection and maintaining function of cultural landscapes of agricultural origin associated with significant historic palace-garden complexes in similar situations to that of Wilanów.

**Keywords:** cultural landscape; wastelands; Wilanów; cultural ecosystem services; informal urban green spaces



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## 1. Introduction

Among the key Sustainable Development Goals, formulated in the document titled 2030 Agenda for Sustainable Development, there was indicated the need of strengthening efforts to protect and safeguard the world's cultural and natural heritage, and providing universal access to safe, inclusive, and accessible, green and public spaces. The same document also stressed that today the world is becoming increasingly urbanized. Since 2007, more than half the world's population has been living in cities, and that share is projected to rise to 60 per cent by 2030 [1], which makes green areas located in cities particularly important.

As highlighted by many researchers, the presence of Urban Green Spaces (UGS) has a direct impact on the health and well-being of city dwellers [2]. Unfortunately, in many cities there is a deficiency of publicly accessible green space [2–5]. In this situation, the importance of Informal Green Spaces (IGS) is increased. The IGS are defined as unmanaged areas, such as vacant lots, wastelands, brownfields, 'leftover areas', and urban derelict places, not formally included in a cities' spatial planning documents as Urban Green Spaces that could level social injustice in UGS provision in cities [2]. Informal Green Spaces in equal measure or area with formally designed UGSs can improve urban residents'

access to many ecosystem services, such as air purification, noise reduction, lowering extreme temperatures [6–8], possibilities for recreation and physical activity [9–11] and opportunities to spend time in contact with nature [12].

Informal Green Spaces are increasingly gaining the attention of city managers seeking solutions to how to expand their cities' green infrastructure to provide residents with equitable access to green spaces [2,13,14]. The IGS researchers point out that although city dwellers still believe that primarily formal green spaces (like parks, squares, urban forests, cemeteries, allotment gardens) can provide a full range of ecosystem services yet, there is an increasing demand for areas less-ordered and more natural [15]. The limited maintenance requirements of the IGS reduce their maintenance costs and favours the enhancement of biodiversity [16–18].

In defining IGS, researchers include agricultural and post-agricultural land, among many other area categories. The types of areas that are recognised as agricultural land in Poland are defined by the Act of 3 February 1995 on the protection of agricultural and forestry land (art. 2). These include areas of agricultural land (e.g., arable land, orchards, meadows and pastures, vegetable gardens), areas of mid-field trees and bushes, family allotments, peat bogs and ponds, and access roads to agricultural land.

Whereas post-agricultural land is land where agricultural use has ceased for various reasons, e.g., unprofitable agricultural production, high level of fragmentation, unfavourable natural or transport conditions, erosion or pollution, administrative decisions changing land use [19] and which, in the lack of new functions, has undergone plant succession [2,10]. Agricultural and post agricultural land is most often found in the suburbs of towns and cities, which absorb suburban land as they sprawl [10]. They are examples of valuable cultural landscapes, the result of centuries of interaction between man and the natural environment. Like other cultural landscapes, they are characterised by several values, both relating to their material and immaterial dimensions [20,21]. Suburban landscapes, subject to rapid urbanisation, are particularly vulnerable to change. Their transformation may be gradual or abrupt [22,23]. They may continue the local tradition, ignore or even destroy it [24,25]. Ignoring local traditions leads to the destruction of distinctive features of the local landscape and to its globalisation [26]. These transformations may reduce their potential to provide certain ecosystem services. As noted by many researchers, degradation of a cultural landscape of an agricultural character because of intensive urbanisation of suburban areas is a problem on a European scale [27–29].

A special and extremely valuable type of cultural landscape with agricultural origins, which has great potential for the realisation of cultural ecosystem services, is the manor landscape. It is a landscape shaped historically in a close relationship with the landowners' residences, distinguished by the diversity of culturally and historically significant elements, including agricultural lands, designed gardens, and historical built environments with residential and farm buildings [21] (Figure 1).

The presence of manor landscapes results from historical conditions. For many hundreds of years, the economy in Poland was based almost exclusively on agricultural production. More than two thirds of all agricultural land, including villages and the population living there, belonged to the nobility and aristocracy [30]. For example, in 1859 there were about seven thousand noble estates in the territory of the Kingdom of Poland, and the area of some of them exceeded ten thousand hectares [30]. The situation was somewhat changed by the enfranchisement of the peasants in the second half of the 19th century, when they took over part of the manor lands and were freed from the obligation of free labour for the nobility.

Private ownership of land and access to cheap labour gave historic landowners the opportunity to aestheticize space on a large scale. In the Baroque era, this manifested itself in the creation of large-scale landscape compositions with a centrally located dominant feature—the owner's residence, surrounded by a garden. The landscape of those times often included such elements as vast avenue systems running among fields with multi-mile compositional axes.

URBAN GREEN SPACES			ARCHITECTURAL ELEMENTS AND ROAD INFRASTRUCTURE ELEMENTS TYPICAL FOR MANOR LANDSCAPE
Formal	Managed Informal	Unmanaged Informal	
	<b>Multifamily housing</b> neighbourhood green space, tenant gardens; common area, residential		<b>MANOR LANDSCAPE</b>
	<b>Social services areas</b> botanical garden, zoological garden, institutional green space; subsidiary green spaces, schoolyards, churchyards		
<b>Parks and squares</b>	<b>Grassland and agriculture</b> arable land, grassland, meadow, orchard, horticulture	<b>Protected areas</b> protected green areas	
<b>Cemeteries</b>	<b>Watersides</b> Lake, wetland, bog, fen, marsh, pond, river, stream, canal, waterside, water reservoir edges	<b>Non-forested vacant lots</b> abandoned, ruderal and derelict area, vacant lots, abandoned lots	
<b>Urban forests</b> Forest, remnant woodland, managed forest, mixed forms	<b>Road and railway greenspace</b> road and railway verges, tree alley and street tree, green buffer	<b>Forested vacant lots</b>	
	<b>Single family housing</b> House gardens		
<b>Allotment gardens</b>	<b>Services</b> commercial green spaces	<b>Industrial and post-industrial areas</b> Brownfields, subsidiary green	
	<b>Airports</b> subsidiary green spaces		

**Figure 1.** Manor landscape in the context of the Urban Green Spaces classification developed for Warsaw according to Daria Sikorska, et al. [2].

Since the end of the 18th century, manor house landscaping has been mainly based on implementation of English ideas of space shaping, which included creation of ornamental farms—“ferme ornée”, shaping picturesque views towards architectural dominants and distinctive elements of natural landscape (e.g., rivers, hills), and the compositional linking of parks and gardens with the surrounding agricultural landscape.

Landscapes of this type often occurred on the borders of towns and suburban estates [21,31–33]. Manorial culture has strongly influenced the landscape of Central Europe, where agriculture, based on archaic manor system, was the main source of income for the population until the Second World War [31].

The contemporary approach in Poland to landscape protection and management, including cultural landscapes, is largely defined by two international documents: the European Landscape Convention [34] and the UNESCO ‘Convention concerning the protection of World Cultural and Natural Heritage’ [35], which is a development of the World Heritage Convention [36]. The message of the UNESCO Convention is regularly updated in the ‘Operational Guidelines for the Implementation of the World Heritage Convention’ [37].

The European Landscape Convention defines landscape as ‘an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors’. This convention applies to all types of landscape, regardless of their state of conservation: ‘outstanding as well as everyday, or degraded, landscapes’. It stresses the need for bottom-up identification of ‘landscape quality objectives’, highlights the changing nature of the landscape over time and defines its conservation as: ‘actions to conserve and maintain the significant or characteristic features of a landscape, justified by its heritage value derived from its natural configuration and/or from human activity’.

The UNESCO ‘Convention concerning the protection of World Cultural and Natural Heritage’ refers explicitly to the cultural landscape, defining it as ‘cultural properties representing the combined works of nature and man’. According to the convention, cultural landscapes are ‘illustrative of the evolution of human society and settlement over time, under the influence of physical constraints and/or opportunities presented by their natural environment and of successive social, economic and cultural forces, both external and internal’. This convention is primarily focused on those landscapes which, due to their ‘Outstanding Universal Value’, can be included on the World Heritage List. The procedures related to their delimitation, valorisation, protection, and maintenance, among others based on management plans, can be considered as a kind of ‘good practice’ that can be implemented also in areas not aspiring to the World Heritage List. The UNESCO Convention points out that the protection of the cultural landscape promotes sustainable land use and can enhance biodiversity. Although the document primarily highlights an expert approach to landscape, it also recommends that proposals for protection in the form of inclusion on the World Heritage List should be prepared in collaboration with and the full approval of local communities.

As remarked on by the researchers, when comparing the documents discussed above, the European Landscape Convention has a more universal scope, takes a regional approach to cultural heritage, and suggests the holistic and social landscape into consideration, while the approach of UNESCO is less regional and less place-specific in its focus [38]. The two documents discussed above can provide a basis for developing a strategy for the protection and management of the cultural landscape under study.

Since the mid-20th century, an increasing number of researchers have begun to treat landscape as a spatial system of interrelated ecosystems [39]. Numerous studies have documented the positive contribution of ecosystems to both material and nonmaterial aspects of well-being [40–42]. Their scope is defined by Millennium Ecosystem Assessment [40] and the Common International Classification of Ecosystem Services (CICES) [41,42].

In Europe, many agricultural landscapes are hot spots of ecosystem service delivery [43]. One of the types of agricultural landscapes particularly significant in terms of the provision of cultural ecosystem services is manor landscape distinguished by the following values:

- distinctive aesthetic and artistic values (relics of composed spatial arrangements, connected with historical architectural dominants),
- historic values (historical connections with important events and figures),
- educational values (source of formal and informal knowledge about the area),
- recreational values (place of recreation and rest),
- social values (place of interaction of residents and tourists),
- spiritual values, including religious (place of religious and spiritual experiences—partly because of the strong links between traditional manor culture and the spiritual aspects of life what was manifested in the landscape).

Many values of agricultural landscapes (including manor landscapes) are synergistically related. For example, researchers of vineyard cultural landscapes in northern Italy have noted that managing the agricultural landscape to maintain aesthetic and heritage values, which primarily means conserving and enhancing its key “traditional” traits, would favour biodiversity [44]. Aesthetic and environmental qualities provided by a cultural landscape correlate with recreational/tourism potential [44].

Researchers indicate that human perception and valuation of urban IGS, such as wastelands and agricultural landscape, are influenced by many factors. One of them is vegetation structure. For example, highly appreciated are intermediate meadows and grassland-like wastelands [45], whereas dense, extensive forest complexes are not preferred by users [43]. People also find attractive grasslands with plant diversity [44,46]. Regarding aesthetic quality of agricultural landscape elements of ecological compensation areas with a vertical structure, i.e., trees and bushes, and species-rich elements were most preferred. Moreover, perceived diversity and naturalness of an element had a strong positive effect

on its rating [47]. Researchers indicate that vertical elements such as (spaced) trees and hedgerows might improve the aesthetic quality of agricultural landscapes by adding character and variety to otherwise often rather homogeneous sceneries [48,49]. This correlation is also confirmed by Italian researchers [44]: ‘Landscapes extensively managed, species-rich grasslands, isolated trees, hedges were appreciated for their scenic beauty’. Historic buildings and tree lines are also rated high and are often recognized as distinctive for the region. Visitors also appreciate natural features such as brooks, rivers, lakes, or patches of forests [43].

Attractiveness of ecosystems and landscapes is also influenced by their educational values and services. According to the study of Mocior and Kruse [50], the most relevant criteria for the evaluation of the educational value were: ‘spatial heterogeneity/diversity, visibility of interesting (educative) features, typicality (representativeness for a process/phenomenon), number of environmental issues you can exemplify, land use type, rarity of the features or ecosystems (on a global or regional scale), easiness to recognise, preservation level (absence of damage/change due to anthropogenic or natural processes), spectacular/outstanding/impressive features, beauty, naturalness, additional cultural values, geological age, conservation status, accessibility and size of a feature.

Researchers of Urban Green Spaces and Informal Green Spaces point out that many other characteristics also influence green spaces attractiveness to users. Urban residents, if given a choice of recreation places, prefer areas located close to their places of residence, with a rural rather than urban character and with a large surface. This regularity applies to both active leisure and passive enjoyment of green landscapes [51]. Areas distinguished by the diversity of forms of use are also preferred [51].

### *Research Focus*

The study seeks to address some gaps in global knowledge. There are currently few studies on the condition and possibilities for the further preservation and contemporary use of rural landscapes associated with historical residences—manor landscapes.

We believe that manor landscapes, historically combining an agricultural function with the need to aestheticize an area, are a valuable element of cultural heritage—at a local and supra-local level. Due to their values, they can provide residents and tourists with access to cultural ecosystem services. Nowadays, they are under threat of transformation, especially if they are located near the borders of large cities. Lack of effective protection and inappropriate use of such areas leads to their disappearance.

In view of the above, the aim of this research is to determine the framework for preservation and urban policies appropriate for maintaining manor landscapes.

The research questions asked in relation to the research aim were:

- How was agricultural land linked to historic residences located on the suburbs of a big city created and transformed?
- What are the contemporary directions of urban spatial policy towards manor landscape located in the vicinity of a big city—on the example of Warsaw?
- What is the potential for manor landscapes to perform UGS and IGS functions, providing residents and tourists with access to cultural ecosystem services?
- What measures should be taken to protect the value of agricultural landscapes associated with historic residences and their ability to provide ecosystem services?

A representative example of a manor landscape, which allows recognition of the phenomena discussed in the article, is the Wilanów cultural landscape—historically used mainly for agricultural purposes, located on the suburbs of the city, in the surroundings of a historic residence, currently under strong urbanization pressure, yet having great potential as a significant element of Warsaw’s urban green space.

## **2. Materials and Methods**

The research included a literature review and data collection by means of an on-site inventory and observations. The borders of the studied area were established based on the

existing ownership borders of the registered plots. The research covered only those areas that were historically linked to the Wilanów residence in terms of economy and location, and which have retained their agricultural or post-agricultural character until the present day. Their surface was determined by measuring them with tools made available by the web services Geoportal.gov.pl [52] and geoportal360.pl [53]. The research methodology was adapted to the research questions addressed.

### 2.1. Study Area

The study area is located within the city of Warsaw, which is the capital and the largest city of Poland [54] (Figure 2a). It covers an area of 299.6 ha of historical agricultural land, located in the vicinity of the historic palace-garden complex in the Wilanów district. The areas included in the research were in the past compositionally connected with the Wilanów palace-garden complex, established in the 17th century as a suburban royal residence. Nowadays, this complex is considered to be one of the most valuable Polish monuments and one of the key Polish tourist attractions. The palace and the gardens are entered in the register of historical monuments.



**Figure 2.** (a) Location of the study area in Warsaw, (b) Boundaries of the study area and general spatial disposition.

The surveyed area was divided for this research into four parts. This division resulted from historical conditions that influenced the current form of development of these areas and their relationship with the Wilanów residence and its gardens. The division of the surveyed areas and their location are presented in the Figure 2b.

- ‘Sielanka Lake surrounding’—an area of historical meadows, belonging since the 19th century to the inhabitants of Wilanów village (formerly manorial), serving not only agricultural functions, but also as a place for local village festivals. Lake Sielanka was in the past connected with the water system of the palace and garden complex in Wilanów.
- ‘The area north of the Wilanów garden and Morysin Park’—an area of fields and historic manorial meadows, closely linked to the Wilanów Gardens and Morysin Park. The Wilanówka River is located here with two other attractive water features—the John III Sobieski Canal and the Zawadowski Pond. The area is bounded on the south by the vast Wilanowskie Lake.
- ‘Morysin Fields’—a fragment of the historical landscape composition of Morysin, containing architectural elements, park greenery, spacious landscape interiors filled with agricultural fields, and an orchard. The area is bordered on the east by the Wilanówka river. Its central part is crossed by an avenue—the Royal Axis—which opens onto the Wilanów palace.
- ‘Areas surrounding Powsinkowskie Lake’—areas of wetland manorial meadows, historically used by the inhabitants of the neighbouring villages of Powsinek and Zawady (a village partly inhabited by the Dutch settlers). The Wilanówka river flows through the area. It is bounded on the south side by the Warsaw Southern Ring Road and on the northside by Zygmunt Vogel Street—which has the character of a dyke (road situated on an embankment due to flood hazard).

The study area is distinguished by an attractive and diverse vegetation cover. In the areas located in the vicinity of water reservoirs and watercourses, the tree layer is dominated by *Salix alba*, *Populus alba*, *Populus tremula* and *Alnus glutinosa*. In drier areas, occur mainly *Tilia cordata*, *Acer platanoides*, *Prunus padus*, *Prunus cerasifera* and *Malus silvestris*. Areas of grassland-like wastelands are overgrown in some places with *Populus alba* and *Betula pendula*. The shrub layer is also rich and includes: *Crataegus monogyna*, *Cornus alba*, *Sambucus nigra*, *Viburnum opulus* and *Lonicera tatarica*. Among the herbaceous plants, there are many attractive flowering plants (Figure 3): *Iris sibirica*, *Nymphaea alba* (protected species), *Hottonia palustris*, *Agrostemma githago*, *Aquilegia vulgaris*, *Dianthus superbus* (protected species) and species from the Orchideaceae family: *Platanthera bifolia* (protected species), *Dactylorhiza majalis* (protected species) and *Dactylorhiza incarnata* (protected species) [55]. There are also many species of wild animals. The birds most often spotted during walks are the mallard duck (*Anas platyrhynchos*), pheasant (*Phasianus colchicus*), white stork (*Ciconia ciconia*), and mute swan (*Cygnus olor*) (Figure 4).

The studied area is partly under legal protection. Its northern part and the Morysin Fields are located within the buffer zone of the ‘Morysin’ nature reserve. The area around Sielanka Lake is located within the buffer zone of the nature reserve ‘Czerniakowskie Lake’. The area surrounding Powsinkowskie Lake is protected only as part of the Warsaw Protected Landscape Area (a form of protection resulting from the provisions of the act on nature conservation of 16 April 2004, aimed at landscape values). Almost the entire analysed area (excluding the surroundings of Sielanka Lake) is located within the boundaries of the Wilanów Cultural Park, which is one of the forms of cultural landscape protection in Poland, based on the provisions of the Act of 23 July 2003 on the protection of historic monuments.



**Figure 3.** Examples of elements increasing the visual attractiveness of the area (a) vertical vegetation forms, distinguishing themselves from arable fields, (b,c) attractive natural flowering plants: *Iris pseudoacorus* and *Aquilegia vulgaris*.



**Figure 4.** Examples of phenomena intensifying the perception of ‘naturalness’: (a) Wilanówka river overgrown with reeds, (b) stumps of withered trees in Wilanowskie Lake, (c) tree trunks leaning over paths. Wild birds observed in the study area: (d) wild duck (*Anas platyrhynchos*), (e) common pheasant (*Phasianus colchicus*), (f) white stork (*Ciconia ciconia*), (g) mute swan (*Cygnus olor*).

There is a lack of coherent urban policy concerning agricultural and former agricultural areas within the boundaries of Warsaw, including the Wilanów district, which is the reason for a high degree of freedom in their management. In general, spatial policy in Warsaw is coordinated by the Office of Architecture and Spatial Planning, among others based on local spatial development plans. In areas where there are no plans (such as part of the area surrounding the palace and garden complex in Wilanów), individual decisions are taken by the city authorities. Both the local spatial development plans and the planned investments are subject to several agreements—among others by the Voivodship Conservator of Monuments (historic areas) and by the Regional Directorate of Environmental Protection (valuable nature areas). Areas not yet covered by any form of protection are under threat of transformation, including build up.

The Wilanów district, within which the examined area is located, has been developing very dynamically in recent years. Urbanization pressure in this area intensified after 2002, when to the east of the palace gardens, in place of former fields and meadows, a large housing estate called Miasteczko Wilanów started to emerge (Figure 5). The construction of Miasteczko Wilanów resulted in a significant increase in the number of inhabitants in the entire Wilanów district—from 14.8 thousand in 2005 to over 36.7 thousand in 2019 [54,56].





**Figure 5.** (a) Bernardo Bellotto Canaletto, view of the Wilanów Meadows, fragment, 1775, source of illustration: Royal Castle in Warsaw, public domain. In the background the Wilanów palace surrounded by agricultural lands situated in the Vistula valley. (b) The present state of the surroundings of the landscape palace-garden complex in Wilanów with the location of the palace symbolically marked, source of illustration: Googlemaps.

As shown in a study by Rędzińska and Szulczewska [26], the inhabitants of the district indicate many negative phenomena, present especially within the boundaries of the newest and currently largest part of Wilanów—the ‘Miasteczko Wilanów’ estate. Some of the most significant difficulties here include: a lack of public playgrounds and other public green areas and generally insufficient vegetation [26].

In view of the district’s growing population, the lack of sufficient green space is a particularly negative phenomenon, limiting access to many ecosystem services, including cultural ones. In this situation, residents seek recreational places on existing agricultural and former agricultural areas in the neighbourhood [26]. These areas are located at a relatively short distance—approx. 1.5 km from the central point of the newest and most densely populated part of the district—‘Miasteczko Wilanów’, however for many people living in the outskirts of the district, this distance is much shorter. Agricultural and former agricultural areas are well connected with the rest of the district by a network of estate roads and partially by a cycle path. They are also on the route of bicycle trips popular among Warsaw inhabitants, the aim of which is to visit the beaches by the Vistula River.

As the researchers note, a characteristic of many Wilanów residents is a very low level of awareness of the cultural values of the area they live in. For example, only 9% of residents of the ‘Miasteczko Wilanów’ housing estate pointed to the Palace and Park Complex as a cultural element that distinguishes this district from others [26]. This phenomenon is a manifestation of the identity crisis of this neighbourhood, which results in greater social consent to the degradation of the values of the local landscape and the intensification of its urbanisation.

## 2.2. State of Preservation of the Historical Surroundings of the Wilanów Residence in the Form of Agricultural Land

The state of preservation of the historical surroundings of the Wilanów residence in the form of agricultural land was assessed by comparing their present state with the states in the 1930s and 1940s. The latter was the last years of Wilanów’s functioning as a private estate when the palace-garden complex was almost entirely surrounded by agricultural land (with the exception of a narrow strip of historic Wilanów village). The states from the 1930s and 1940s were established on the basis of the archival map of Warsaw from 1931 (from the collection of the National Library in Warsaw), aerial photographs of the areas bordering the palace-garden complex in Wilanów (from the collection of the National Library in Warsaw) and archival photographs showing the relationship between

the Wilanów Garden and the surrounding agricultural landscape (from the collection of the Institute of Art of the Polish Academy of Sciences).

The existing condition of agricultural and former agricultural areas in the vicinity of the Wilanów residence was identified on the basis of an orthophotomap of Warsaw from 2020, obtained from the website of the Warsaw Municipal Office [57], on which their location was determined and their area was measured, with a distinction made between areas diversified in terms of land cover: agricultural fields, meadows, orchards, watercourses and water reservoirs, wastelands and other (areas divided into building plots, designed green spaces, golf course). Information on land cover forms was verified during on-site visits. Next, the percentage share of individual land cover forms in the total surface of the studied area was determined.

### *2.3. Contemporary Directions of Spatial Policy for the Analysed Area*

The contemporary directions of spatial policy for the area under study were established based on an analysis of Warsaw's planning documents, which define the current and future forms of development of the area under study. The areas for which local spatial development plans currently exist were identified, those for which such plans are under preparation, and those for which they are lacking, making it difficult to pursue a coherent spatial policy.

Recognising that the form of ownership has an impact on the possibility of public recreational use of an area, the types of land ownership occurring in the analysed area were categorised, based on data obtained from the website of the City of Warsaw: [58].

### *2.4. Determination of the Potential of Historic Agricultural Areas Located in the Vicinity of the Wilanów Residence to Provide Residents and Tourists with Access to Cultural Ecosystem Services*

In order to determine the potential of the historic agricultural areas located in the vicinity of the Wilanów residence to fulfil UGS and IGS functions, such as providing residents and tourists with access to cultural ecosystem services, it was assessed whether and to what extent the examined areas provide benefits related to recreation, aesthetic enjoyment, and spiritual fulfilment.

Based on benefits related to cultural ecosystem services indicated in Millennium Ecosystem Assessment [40], in Plieninger et al.'s research [59] and CICES [41,42], the list of potential benefits provided by the Wilanów manorial landscape was established. The list covers: aesthetic values, spiritual and religious values, cultural heritage values, recreation and ecotourism, knowledge systems and educational values, sense of place, inspiration for art and social relations. The list of potential benefits was adjusted to be more relevant to the specifics of the study area. Some benefits or characteristics of the environmental setting, mentioned in the publications, were not taken into consideration as non-applicable for the Wilanów manorial landscape.

According to researchers [59,60], benefits linked to the cultural functioning of the landscape that people may receive from ecosystems may concern diverse issues; examples are presented in Table 1.

For each benefit, criteria of valuation were proposed. All selected criteria were justified based on literature review concerning each type of values.

For aesthetic values, the following criteria were chosen: naturalness, plant diversity, meadows and grassland-like wastelands, vertical structure of vegetation, presence and size of spectacular features. Those features were reported by researchers as improving aesthetic quality of agricultural landscape and highly appreciated by people [45–49].

For spiritual and religious values, the following criteria were chosen: presence of a shrine or cross and the presence of a vista on a religious architecture, as researchers have pointed out that small sacred Christian architecture has a significant importance in cultural landscapes in Europe [62,63].

**Table 1.** Examples of landscapes providing benefits linked to the cultural functioning of the landscape that people may receive from ecosystems.

Benefits Linked to the Cultural Functioning of the Landscape That People May Receive from Ecosystems	Example of the Landscape	Reference
• aesthetic (ecosystem as a source of beauty and aesthetic value)	Wörlitz landscape Aranjuez landscape	[32,33]
• artistic (ecosystems as a source of inspiration for artwork)	Wilanów landscape painted by B. B. Canaletto	[61]
• bequest (satisfaction from preserving a natural environment for future generations)	Landscape of Warsaw nature reserves for example Morysin nature reserve or Ursynów nature reserve	[61]
• cultural heritage (contribution to diversity of cultures and cultural heritage)	Wörlitz landscape Aranjuez landscape—World Heritage Sites	[32,33]
• education (role of ecosystems in providing formal and informal education)	New York community gardens landscape where parents taught their kids about where food came from while farming together	[47]
• existence (satisfaction from knowing that a site is preserved in a proper condition)	Wörlitz landscape and Aranjuez landscape—World Heritage Sites	[32,33]
• identity (the role of nature in creating sense and identity)	Wilanów landscape	[26]
• ingenuity (aid in developing innovative ideas, approaches, or practices)	Warsaw informal green spaces	[54]
• knowledge systems (the influence of ecosystems in the types of knowledge systems developed by different cultures)	New York community gardens landscape where refugees from different parts of the world could learn new techniques of food production	[60]
• life teaching (opportunities for learning life lessons)	New York community gardens landscape where parents taught their kids about where food came from while farming together	[60]
• mental health (contributions of ecosystems to mental health)	“Green is good—it made me happy” according to the statement of Somalian refugee working in New York community gardens	[60]
• perspective (helping people to gain perspective on their place in the world, to see where they fit, or to put things back in perspective)	Any cultural landscape: “With the different seasons, we can see that everything has its place. There is a time to do something in life, there is a time to rest.”—remark of a refugee experiencing four seasons in cultural landscape	[60]
• recreation (leisure and recreation activities provided by ecosystems)	Wilanów landscape	[61]
• ecotourism (nature-oriented tourism)	The landscape of vineyards in Northern Italy	[48]

Table 1. Cont.

Benefits Linked to the Cultural Functioning of the Landscape That People May Receive from Ecosystems	Example of the Landscape	Reference
<ul style="list-style-type: none"> <li>sense of place (developing meanings and attachment to a setting held by an individual or group)</li> </ul>	Wilanów landscape as a factor of building sense of place for citizens of Miasteczko Wilanów	[26]
<ul style="list-style-type: none"> <li>social relations (contributions to establishment of social relationships)</li> </ul>	In a study of Tibetan refugees resettled in Toronto, a local park provided a place to socialize and “mingle with other Tibetans”	[60]
<ul style="list-style-type: none"> <li>spirituality (spiritual and religious values associated with ecosystems)</li> </ul>	Wilanów landscape and its sacral elements	[62]

For cultural heritage values, the following criteria were chosen: historical architecture or garden element and vista on historical architecture element. Heritage values are mainly related to tangible cultural heritage including historic objects and features within a landscape that remind us of our roots, providing a sense of continuity and understanding of our place in our natural and cultural environment [40].

For recreation and ecotourism, the following characteristics of the environmental setting that enable, facilitate or support recreational activities were chosen: presence of paved walking paths with recreational infrastructure, presence of bicycle paths, presence of golf course, presence of unpaved field roads, presence of food services activities, presence of platforms and accesses to the water, accessibility of the area for public use and rural character of the area. Similar measures to describe the physical content of the public recreation spaces was used in earlier studies [64,65].

For knowledge systems and educational values, the following criteria were chosen: presence of protected plant species, presence of native plant communities, conservation status and rarity of the process or phenomenon. These features were mentioned by Mocior and Kruse [50] as the most relevant criteria for the evaluation of the educational value.

As criteria of the valuation of the potential for building a sense of place, the following two features were chosen: preservation level of rural areas and the clear connection to the historic site. Cultural heritage within the landscape helps to maintain meanings and a sense of collective identity [66].

Inspiration for art was also chosen as one of the criteria of valuation. According to MA [40] environment may provide a rich source of inspiration for art. Moreover, Plieninger et al. [59] pointed out that sites may stimulate new thoughts, ideas, or creative expressions.

For social relations valuation, the presence of conditions conducive to the following social activities were considered: walks, bike riding, jogging, playing on the playground, fishing, and meetings by the fire. It was found that the delivery of social relations is highly related to landscape features [67].

Information on social activities occurring in the research area were provided during on-site observation. All on-site observations were made by both researchers involved in the study. The on-site research was conducted in June 2021, on public holidays, in conditions favourable for outdoor recreation. Observations were carried out four times. A single observation took 3 h and was carried out between 11 am and 2 pm. While on-site, study the researchers moved through the study area and registered any activity they noticed. Only the presence of the activities observed were recorded, the exact number of people involved in the activity was not recorded.

For the most of criteria, the presence or absence of the features were determined. In several criteria, a valuation visual analogue scale was used, ranging from 0 to 3. Each of the criteria were evaluated and rated on-site by two professional landscape architects. This evaluation adopted a qualitative approach where the rating of each analysed area was

based on a discussion about the degree of presence of the considered features. A similar approach was used earlier by Peschardt and Stigsdotter [68].

All criteria characteristics and their valuation are described in Tables 2 and A1.

**Table 2.** Criteria characteristics and their valuation.

Cultural Ecosystem Services	Valuation
1. Aesthetic Values	
1.1. naturalness	Evaluation to what extent the natural environment has been modified. Visual analogue scale was used, ranging from 0—means extensively modified environment, to 3—means largely unmodified environment.
1.2. plant diversity	Existence of wide variety of plant species. Visual analogue scale was used, ranging from 0—means lack or very low level of vegetation species diversity, to 3—means occurrence of species characteristic for plant communities of varied character (meadow, forest, water, and waterside), enriched with species of agricultural and fruit crops.
1.3. meadows and grassland-like wastelands	Defined as the % share of these land cover forms based on measurements made with tools: Geoport.al.gov.pl. [52] and geoport.al360.pl [53] (evaluation on a scale of 0–3: 0—none, 3—more than 70%).
1.4. vertical structure of vegetation	Presence of vertical landscape elements, such as trees and bushes. Visual analogue scale was used, ranging from 0—means meadow or grassland-like area with small number of vertical elements, to 3—means meadow or grassland-like area with high number of vertical elements.
1.5. presence and size of spectacular features	Presence of cultural and natural objects distinguished by their character or scale against the background of the Warsaw landscape: e.g., presence of historical buildings and compositions of supra-local importance, presence of natural reservoirs and watercourses. Visual analogue scale was used, ranging from 0 to 3.
2. Spiritual and Religious Values	
2.1. presence of shrine or cross	0 indicates the absence and 1 the presence of the feature.
2.2. presence of vista on religious architecture	0 indicates the absence and 1 the presence of the feature.
3. Cultural Heritage Values	
3.1. historical architectonic or garden element	0 indicates the absence and 1 the presence of the feature.
3.2. vista on historical architectonic element	0 indicates the absence and 1 the presence of the feature.
4. Social Relations	
4.1. walks	0 indicates the absence and 1 the presence of this form of activity.
4.2. bike riding	0 indicates the absence and 1 the presence of this form of activity.
4.3. jogging	0 indicates the absence and 1 the presence of this form of activity.
4.4. playing on the playground	0 indicates the absence and 1 the presence of this form of activity.
4.5. fishing	0 indicates the absence and 1 the presence of this form of activity.

Table 2. Cont.

Cultural Ecosystem Services	Valuation
4.6. meetings by the fire	0 indicates the absence and 1 the presence of this form of activity.
5. Recreation and Ecotourism	
5.1. paved walking paths with recreational infrastructure	0 means absence and 1 means presence of this form of land use.
5.2. bicycle paths	0 means absence and 1 means presence of this form of land use.
5.3. golf course	0 means absence and 1 means presence of this form of land use.
5.4. unpaved field roads	0 means absence and 1 means presence of this form of land use.
5.5. presence of food services activities	0 means absence and 1 means presence of this form of land use.
5.6. presence of platforms and accesses to the water	0 means absence and 1 means presence of this form of land use.
5.7. accessibility of the area for public use	Visual analogue scale was used, ranging from 0—means a formal ban on access to the site, reinforced by a permanent fence, to 3—means public area without any restrictions.
5.8. rural character of the area	Visual analogue scale was used, ranging from 0—means urbanised area, devoid of rural buildings relics and agricultural land use, to 3—means an area with surviving rural buildings, including farm buildings and land used for agricultural purposes.
6. knowledge systems and educational values	
6.1. presence of protected plant species	0—means lack of protected plant species and 1—means presence of at least one protected plant species.
6.2. presence of native plant communities	Presence of native plant communities characteristic for the Vistula river flood terrace (e.g., riparian forest communities, wet meadows). Visual analogue scale was used, ranging from 0—means lack of native plant communities, and 3—means high amount of native plant communities.
6.3. conservation status	Location within the boundaries of an area subject to legal protection due to its values, e.g., within the buffer zone of a nature reserve, a Monument of History (form of historic monument protection) or a cultural park (form of historic monument protection). 0 means location outside the boundaries of the forms of protection, 1—within the boundaries.
6.4. rarity of the process or phenomenon	Determination of occurrence in the study area of an object or process not present or rare in other locations, e.g., material relics of a Dutch settlement in this region of Poland. 0 means the lack of such object or process, 1 means occurrence of such object or process.
7. Sense of Place	
7.1. preservation level of rural areas	Preserved tradition of agricultural land use and absence of its change due to anthropogenic or natural processes. Visual analogue scale was used, ranging from 0—means absence of the feature, to 3—means its presence, both in terms of type of development and agricultural land use.
7.2. the clear connection to the historic site	Preserved compositional, viewing, or utilitarian connections with the historical dominant of the area (Wilanów palace-garden complex). Visual analogue scale was used, ranging from 0 means absence of the feature, to 3—means very clear links between the study area and the historic site.

Table 2. Cont.

Cultural Ecosystem Services	Valuation
8. inspiration for art	
8.1. source of inspiration for art	The fact of using the surveyed area as the subject of a work of art (e.g., the subject of a painting), or using it as a place for artistic activities. Rating on a scale of 0–1, where 0 means the absence of the feature, 1 its presence.

### 2.5. Statistical Analysis

All calculations were performed using Statistica 13.3 software. The quantitative continuous variables (type of land ownership and form of land use in %) did not follow a normal distribution. To compare medians of the quantitative continuous variables in groups where the qualitative variables are present/absent (presence/absence of the features describing cultural ecosystem services) the Mann–Whitney U test was used. The qualitative variables co-presence was assessed using Chi square test.

To find groups of similar items (presence/absence of the features describing cultural ecosystem services, type of land ownership and form of land use) hierarchical cluster analysis was used to produce a hierarchy of clusters, ranging from small clusters of very similar items to larger clusters of increasingly dissimilar items (agglomerative clustering).

The Ward method was used, that involves an algorithm (dendrogram) which starts with  $n$  clusters ('leaves') and continues (forms 'branches') until observations are included into one cluster ('trunk'). The distance between objects in one cluster depends on how similar the objects in the cluster are—the smaller the distance the stronger the similarity.

To describe similarities between objects (areas) another cluster analysis was used.

For both qualitative and quantitative variables, the k-means algorithm was used, that tries to partition the dataset into distinct, non-overlapping clusters and tries to make the intra-cluster data points as similar as possible while keeping the clusters as different as possible.

A  $p$ -value of  $<0.05$  is considered significant for all tests'.

The results of the research were used to formulate a general framework for spatial policy and forms of use for the analysed areas, which would help to preserve the historical landscape context of one of the most valuable Polish monuments, and at the same time would contribute to the creation of space for recreation and leisure for the residents of the intensively developing district of Warsaw-Wilanów.

## 3. Results

### 3.1. State of Preservation of the Historical Surroundings of the Wilanów Residence in the Form of Agricultural Land and Directions of Its Transformation

The royal residence in Wilanów was historically surrounded by fields and meadows. It was connected to agricultural areas both economically and compositionally—its gardens were linked by axes and view openings with the surrounding agricultural landscape (Figure 6). Agriculture dominated here until the mid-20th century, although from the 1860s more and more land belonging to the owners of Wilanów was transferred to peasants because of enfranchisement, and in 1944 all agricultural land surrounding the residence was nationalized, as well as the palace and the palace garden [61].

However, regardless of the type of land ownership, agriculture remained the primary form of land use until the end of the 1940s. The situation began to change after Wilanów was incorporated into Warsaw in 1951, when part of the former fields was allocated for housing and transport infrastructure, and agricultural use under urban conditions ceased to be an attractive source of income.



**Figure 6.** (a) Wilanów palace and garden complex surrounded by agricultural land, interwar period, source of illustration: National Library in Warsaw, public domain. (b) Wilanów palace and garden complex surrounded by agricultural land, 1931, source of illustration: National Library in Warsaw, public domain, (c) View from the palace gardens towards the arable fields, 1936, source of illustration: Institute of Art of the Polish Academy of Sciences, Warsaw.

Historical agricultural land in the surroundings of the Wilanów palace-garden complex, which in the past had an owner (the owner of the Wilanów residence), is now under various forms of ownership (Table 3), of which state-owned property predominates—59.5% (mainly land under management of the Warsaw University of Life Sciences-SGGW and the Museum of King John III in Wilanów). Of note, is the very low proportion of municipal land—3.3%. The remaining area (37.2% of the study area) has other forms of ownership, with private ownership dominating. Private areas were excluded from public use and barriers were erected at their entrances (Figure 7).

**Table 3.** Types of land ownership.

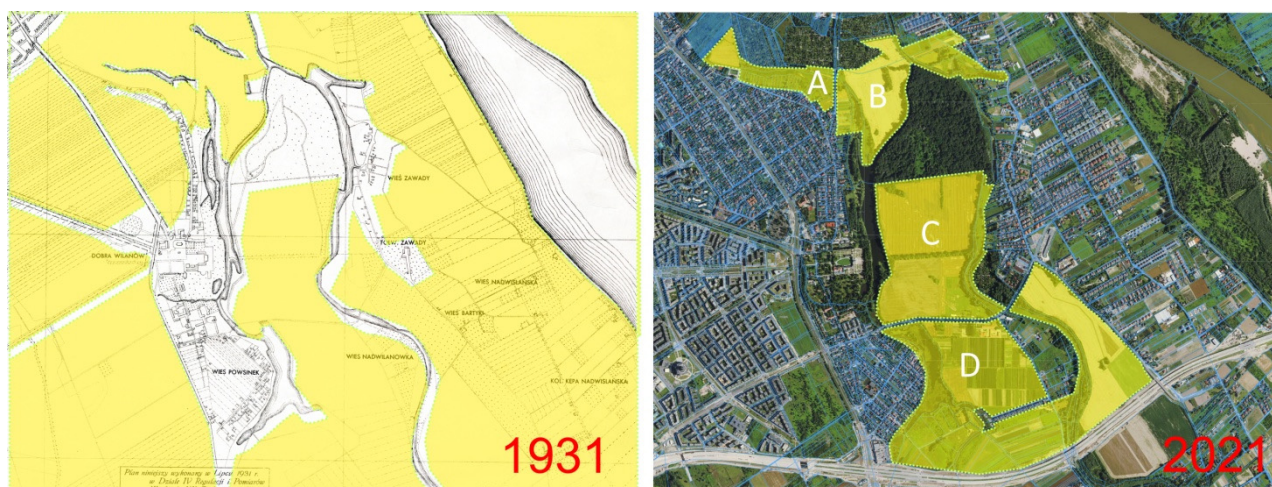
Type of Land Ownership	Sielanka Lake Surrounding	The Area North of the Wilanów Garden and Morysin Park	Morysin Fields	Areas Surrounding Powsinkowskie Lake	All Analysed Sites Together
State-owned property	0%	67.3%	96.9%	73.7%	59.5%
Ownership of the City of Warsaw	1%	6.6%	3.1%	2.5%	3.3%
Other ownership—mainly private ownership	99%	26.1%	0%	23.8%	37.2

Only part of the studied area is currently used for agriculture (Figure 8). Arable fields (Figure 9) are mainly occupied by cereals and sometimes vegetables or ornamental plants, and cover 37.75% of the study area, meadows 5.5%, and an orchard 6.25% (this is an experimental orchard of the Warsaw University of Life Sciences). 34% of the study area is wasteland, which was still agricultural land in the 1st half of the 20th century were agricultural areas (and some of them much longer). At present, they are changing dynamically because of plant succession (Figure 10c). In a few locations, traditional individual rural farms have been preserved (Figure 11).





**Figure 7.** Barriers restricting access to private plots of land, now within the boundaries of historic agricultural land (a) in the area of Sielanka Lake, (b) north of Wilanów Gardens, (c) in the vicinity of Morysin nature reserve.



**Figure 8.** The extent of agricultural and post-agricultural land (marked in yellow) in the cultural landscape of Wilanów in 1931 (on the left) and today (on the right; (A) Sielanka Lake Area, (B) area north of the Wilanów Garden and “Morysin” nature reserve, (C) Morysin Fields, (D) Powsinkowskie Lake Area).

Due to its location in the Vistula valley, the study area has numerous reservoirs and watercourses that, historically, were also very important for economic and compositional reasons. They occupy about 7.5% of the study area. Some of them, such as Sielanka Lake or the Wilanówka River, due to problems with water supply, are slowly disappearing and overgrown with reeds (Figure 12).

Some fragments of historic agricultural land in the vicinity of the Wilanów residence have been built over in the last few decades, which from a conservator’s point of view is a very unfavourable phenomenon as it destroys the authenticity of the surroundings of one of Poland’s key monuments. During the study, it was found that this process is still on-going—in several locations within the study area, former agricultural land was found to be subdivided into individual plots, indicating that urbanisation pressures are intensifying in the area.

A golf course and a recreational area with a playground at Powsinkowskie Lake are particular forms of development of former agricultural land in the study area (Figures 13 and 14). The attractiveness of the studied areas results in the local inhabitants creating temporary ‘recreational infrastructure’, e.g., access to the water through reeds, wooden piers made of branches, places for mooring boats, fishing stands (Figure 15), in places chosen by them.



**Figure 9.** Arable fields in the vicinity of the Wilanów residence: (a) arable field prepared for planting, (b) an oat-field, (c) cultivation of peonies, (d) garlic cultivation.



**Figure 10.** (a) Meadows north of Wilanów Gardens, (b) experimental orchard of the Warsaw University of Life Sciences, (c) post-agricultural land around the Sielanka Lake (historically—meadows).



**Figure 11.** Remains of traditional agricultural use of the study area: (a) knotted willow trees, (b) a small farm, (c) small-scale poultry farming.



**Figure 12.** Examples of water features in the landscape: (a) Zawadowski Pond, (b) Powsinkowskie lake, (c) Wilanówka River.



**Figure 13.** (a) Golf course on Zygmunt Vogel Street (b) Playground at Powsinkowskie Lake, source of illustrations: Googlemaps.



**Figure 14.** Land use elements, characteristic for the designed green spaces, occurring within the boundaries of the studied area: (a) partially paved pathway along Powsinkowskie Lake, (b) Playground at Powsinkowskie Lake, (c) benches and tables for board games at Powsinkowskie Lake, (d) a shelter on the golf course in Zygmunt Vogel Street.

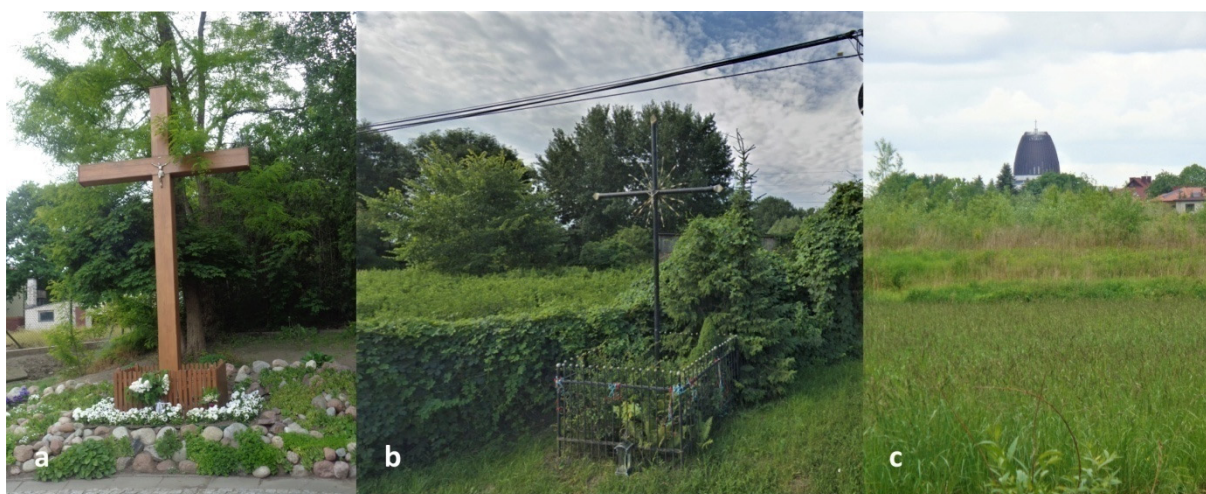
Despite significant changes within the borders of the studied areas that have taken place over the last several dozen years, their historical visual connections with the palace and garden complex in Wilanów, for which the surrounding fields constituted the background and complemented the composition, are still clear (Figure 16). Historically important elements of the rural, agricultural landscape of Wilanów were religious buildings and roadside crosses. While the historic church of St. Anne, located next to the Wilanów palace, is no longer visible in the landscape (due to its being covered by trees), a new temple of supra-local significance—the Temple of Divine Providence—appears in many views from the studied areas. The tradition of erecting roadside crosses is also continued (Figure 17).



**Figure 15.** Traces of informal recreational use of the study area: (a) Access to the shore of Wilanowskie Lake trampled and reinforced with branches, (b) temporary platform on Wilanowskie Lake, (c) traces of a fireplace at Wilanowskie Lake, (d) temporary fishing spot, (e) a boat on the shore of Powsinkowskie Lake, (f) rubbish (food and fish bait packaging) on the shore of Wilanowskie Lake.



**Figure 16.** Visual connections between the surrounding agricultural land and Wilanów Gardens. (a) View from Morysin Fields towards the palace and baroque part of the Wilanów Garden, (b) View from the area north of the Wilanów Garden towards the landscape part of the Wilanów Garden with the monument of the Battle of Raszyn, (c) View from the area north of Wilanow Gardens towards the landscape part of Wilanów Gardens with the Roman Bridge, (d) View from Morysin Fields towards the neo-Gothic gate to Morysin.



**Figure 17.** Sacred elements on agricultural and post agricultural land in the surroundings of the Wilanów palace and garden complex: (a) a wayside cross near Powsinkowskie Lake, (b) a wayside cross north of the ‘Morysin’ nature reserve, (c) A view of the dome of the Temple of Divine Providence from the area around Powsinkowskie Lake.

The percentage share of different land uses within the boundaries of the study area is presented in Table 4.

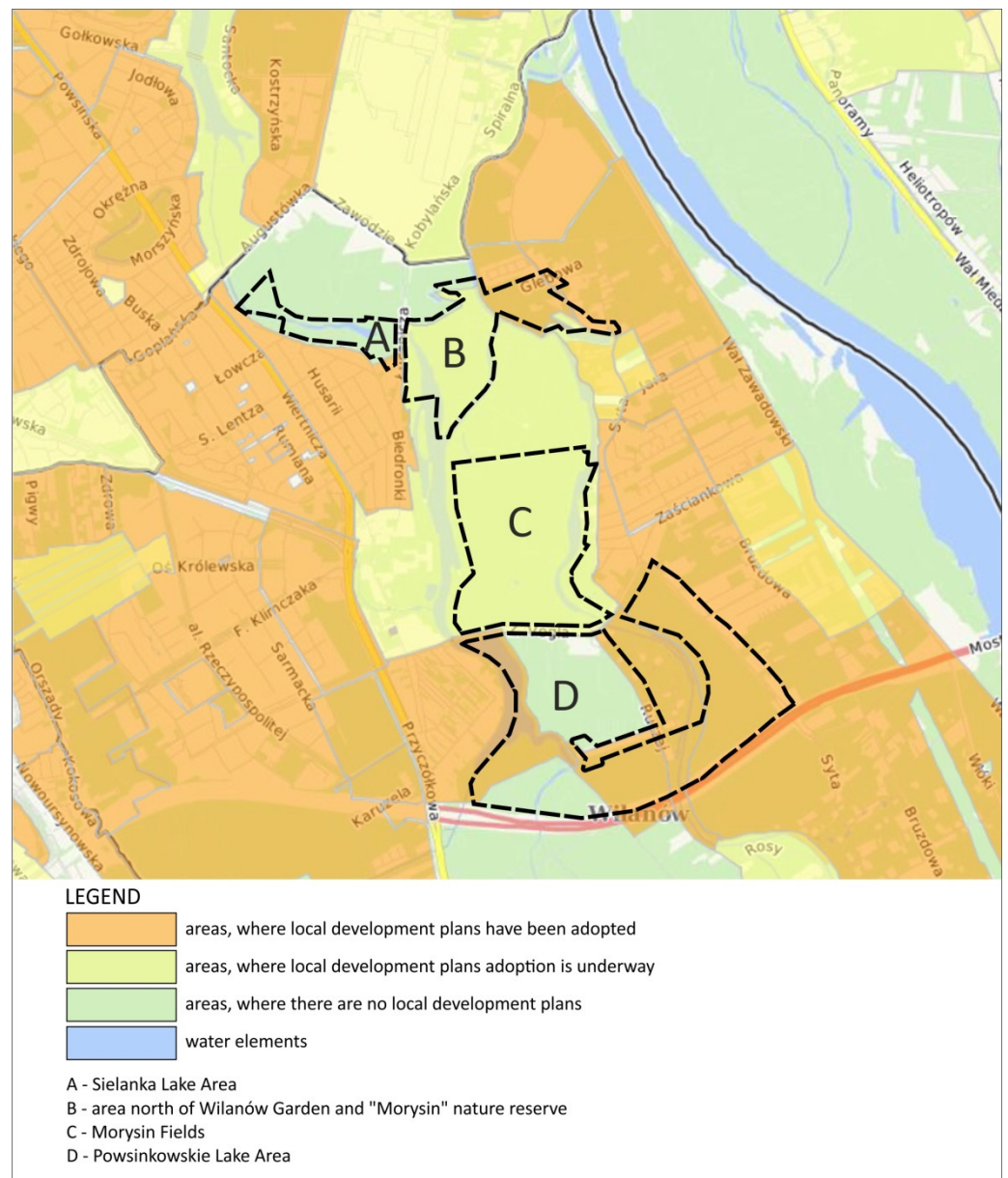
**Table 4.** Percentage of different land uses within the study area.

Form of Land Use	Sielanka Lake Surrounding	The Area North of the Wilanów Garden and Morysin Park	Morysin Fields	Areas Surrounding Powsinkowskie Lake	All Analysed Sites Together
total surface	25.4 ha	47.4 ha	68.8 ha	158 ha	299.6 ha
arable fields	0%	45%	76%	30%	37.75 %
meadows	15%	4%	0%	3%	5.5%
orchards	0%	0%	0%	25%	6.25 %
water courses and reservoirs	1%	14%	6%	9%	7.5 %
wastelands in various stages of natural succession	63%	31%	10%	32%	34%
areas divided into building plots (not yet built-up) or occupied for other functions	21% 25 plots	6% 13 plots	8% golf course	1% recreational area with a playground	9%

### 3.2. Contemporary Directions of Spatial Policy for the Analysed Area

In order to establish the current framework of urban spatial policy for the study area, the planning documents concerning it—local spatial development plans having the status of local law in Poland—were analysed.

It was found that only for a part of the study area has local plans been adopted (Figure 18), which may lead to a high degree of freedom in development and degradation of the value of the area. A lack of local plans has been noted for part of the land situated to the north of the Wilanów palace and garden complex and near Sielanka Lake. There is also no local plan for Morysin Fields, the area of experimental orchards of the Warsaw University of Life Sciences and a fragment of land near Warsaw’s southern ring road.



**Figure 18.** Coverage of the study area by local development plans.

Only fragments of the area around Powsinkowskie Lake and the Warsaw southern ring road are covered by local plans in the study area (Figure 18). The conditions arising from these plans are:

- Powsinkowskie Lake and the surrounding areas have been recognised as part of the protection area of the city's natural system and as an area related to the cultural landscape of the Wilanów residence. The protection of the Ratio of Biologically Vital Areas is to be aimed here, especially water and meadows. The dominant form of use is to be agriculture and recreation (including the already existing walking path along the western shore of Powsinkowskie Lake). Changes to local water relations, landform and introduction of buildings are prohibited.
- For the areas located between the experimental orchard of the Warsaw University of Life Sciences and the southern ring road of Warsaw, the leading functions are to be park greenery (the Ratio of Biologically Vital Areas—80%), park greenery with permissible small service facilities (the Ratio of Biologically Vital Areas—70%) and single-family housing. A bicycle path along the embankment of the Warsaw southern

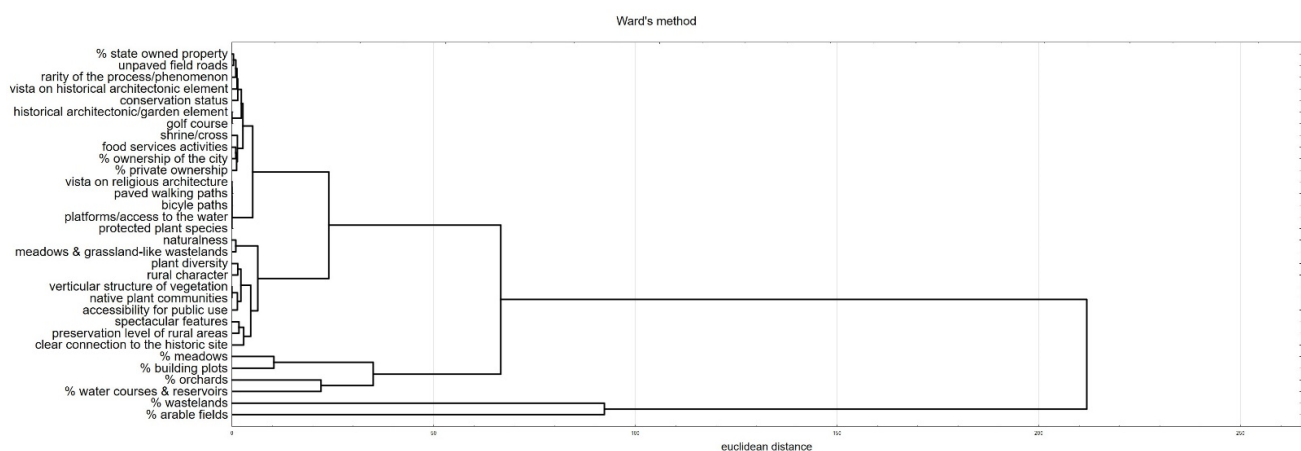
ring road is also allowed here. The area is in the ‘Protection zone of the cultural landscape of the Warsaw Escarpment and the large-space Wilanów complex’, which results in prohibition of localization of buildings higher than 12 m, prohibition of planting trees higher than 12 m and protection of axes and viewpoints against being built over.

- For the area along the Wilanówka River, the leading form of development is to be park greenery, arranged based on the existing waterside greenery (the Ratio of Biologically Vital Areas—90%). The development of a pedestrian and cycle path, small architecture and food service facilities, small sports fields, and tennis courts as well as horse riding facilities are all permitted here. The area to the east of the Wilanówka River is intended to retain its current character as an agricultural experimentation area.

### 3.3. Potential of Historic Agricultural Areas Located in the Vicinity of the Wilanów Residence to Provide Residents and Tourists with Access to Cultural Ecosystem Services

According to the statistical analysis, the following features of the studied areas tend to occur together:

- Presence of such forms of land use as arable fields and wastelands in various stages of natural succession.
- Presence of such forms of land use as water courses and reservoirs as well as orchards, meadows and areas divided into building plots (not yet built-up) or occupied for other functions.
- All criteria of aesthetic values (presence and size of spectacular features, vertical structure of vegetation, plant diversity, naturalness, meadows, and grassland-like wastelands), all criteria of sense of place category (preservation level of rural areas, the clear connection to the historic site), presence of protected plant species and two criteria of recreation and ecotourism category (rural character of the area and accessibility of the area for public use).
- Presence of all types of land ownership (ownership of the City of Warsaw, state-owned property, other ownership—mainly private ownership), five criteria of recreation and ecotourism category (unpaved field roads, paved walking paths with recreational infrastructure, bicycle paths, presence of platforms and accesses to the water and presence of food services activities), all criteria of spiritual and religious values (presence of shrine or cross and presence of vista on religious architecture), three criteria of knowledge systems and educational values (conservation status, rarity of the process or phenomenon and presence of protected plant species) and one criterion of cultural heritage values (vista on historical architectonic element) (Figure 19).



**Figure 19.** Cluster analysis for presence/absence of the features describing cultural ecosystem services, type of land ownership and form of land use in four examined areas.

According to the statistical analysis the following activities of the studied areas tend to occur together: walks, bike riding, jogging, and fishing. It was also found that where food services activities are present, meetings by the fire are observed. Where unpaved field roads are present, the following activities occur: walks, bike riding, jogging, and fishing.

According to the cluster analysis, two types of areas were distinguished:

Sielanka Lake surrounding characterized by:

- lack of unpaved field roads, accessibility of the area for public use, preservation level of rural areas, state-owned property, orchards, and arable fields,
- the lowest score in valuation of presence and size of spectacular features and rural character of the area,
- the lowest percentage of water courses and reservoirs and land owned by the City of Warsaw,
- the highest score in valuation of naturalness and meadows and grassland-like wastelands,
- the highest percentage of meadows, wastelands in various stages of natural succession and areas divided into building plots (not yet built-up) or occupied for other functions.
- the following activities were not observed: walks, bike riding, jogging, and fishing.

Other studied areas.

#### 4. Discussion

##### 4.1. Adopted Research Methods in Comparison with Methods Used by Authors of Similar Studies

To assess the hypothesis formulated in the introduction to the paper and to answer the research questions posed, research methods appropriate to the subject of the article were used. They were largely similar to those used by other authors of works on similar topics.

The starting point for the research on the historical spatial form of the study area and its transformation was the analysis of historical sources—mainly archival maps and photographs, and a comparative analysis of the land use documented in historical sources and its current state. A similar method was used by Ranja Hautamäki analysing the transformation over time of agricultural landscapes within Helsinki [21], Heike Tenzer studying changes in the cultural landscape of Wörlitz [33] and the team of researchers studying the landscape of the royal residence in Aranjuez [32]. Both studies of the historical landscape of Wilanów, as well as those at Helsinki, Wörlitz and Aranjuez have been supported by literature review.

The current development of the agricultural and former agricultural land surrounding the Wilanów palace-garden complex was studied in a similar way to the case of the study of the historical landscapes of the residences mentioned above: we conducted an on-site inventory and analysed the land cover on contemporary orthophotos.

The data necessary to analyse the current urban policy for the studied area of Wilanów were obtained from the Warsaw City Hall. Similar sources, specific to Helsinki, were used by a researcher of agricultural areas there, pointing out the imperfections of the studied planning documents and the resulting forms of protection [21].

To determine the potential of historic agricultural areas located in the vicinity of the Wilanów residence to provide residents and tourists with access to cultural ecosystem services, our own methodology was used. Based on a literature review, it was determined which features or characteristics of the environmental setting were reported by other researchers as favourable to the provision of selected benefits, and those features or characteristics were identified and evaluated in Wilanów case. The evaluation adopted a qualitative approach previously used by Peschardt and Stigsdotter [68]. To collect all necessary data, on-site inventory and observations were used. These methods proved to be efficient in previous research [67].

##### 4.2. State of Preservation of the Historical Surroundings of the Wilanów Residence in the Form of Agricultural Land

The state of preservation of the historical landscape is of great importance for the perception and functioning of historic buildings and areas within them [69,70]. In the case



of historic landowners' residences, this environment consisted of land used for agricultural purposes [21]. Its form was never accidental—it usually resulted from both aesthetic and economic considerations. This regularity, clear in the landscape of Wilanów, has also been noticed by researchers of other residences e.g., in Wörlitz, Germany [33], in Aranjuez, Spain [32] or in former landowners' residences on the outskirts of Helsinki [21].

As Hautamäki [21] rightly noted, today the landscape around many historic residences is undergoing major transformation. This phenomenon has a much broader scale—in general, agricultural areas on the border of large cities are being transformed. As Wasilewski and Krukowski noted 'Local alliances of landowners, governments, and society in general are the drive force behind rapid urbanization of rural areas outside Polish cities' [71]. The landscape of Wilanów is also changing dynamically, mainly because of urbanization of former agricultural areas located in the suburbs of Warsaw [26] or, as is the case in the studied areas in the close vicinity of the palace-garden complex, because of abandonment of agricultural production. The abandonment of agricultural production in the studied area meant that 34% of the acreage of former fields and meadows is now wasteland. New functions are also being introduced to the former fields and meadows: a golf course, a playground, a cycle path.

Changes in the landscape around historic residences are part of a much broader process affecting cultural landscapes with agricultural traditions. Researchers believe that changes of a cultural landscape of an agricultural or a suburban character because of intensive urbanisation, is an inevitable process and represents a problem on a European scale [27–29] and that protecting cultural landscapes that have been shaped by agricultural land use has proved difficult in the urban context [21]. As researchers of agricultural land on the outskirts of Barcelona noted: 'agricultural uses in the rural-urban fringe struggle to survive in the face of urban pressures and sprawl' [72]. The research on the landscape of Wilanów confirms that maintaining the historic agricultural function of the areas in the surroundings of the historic residence within the city limits is extremely difficult, and their protection is currently based more on legal tools related to nature conservation (e.g., in the form of buffer zones of reserves or protected landscape areas), than on the protection of historic monuments, which makes the cultural values of these areas particularly endangered.

As the example of the Dessau-Wörlitz cultural landscape shows [33], one of the tools supporting the manor landscape protection may be entry into the register of monuments—an effective means of controlling the forms of land development in an area of exceptional cultural values. On the other hand, the example of preserved agricultural land on the outskirts of Barcelona shows that recreational use of such land strengthens its connection to the local community and contributes to its conservation [72]. The possibility of implementing alternative food networks (AFNs) policies, targeting local food production, linking peri-urban farmlands and cities, and guaranteeing the maintenance of agricultural land use is also an option worth considering. This type of solution was used in Baix Llobregat Agricultural Park in Barcelona [72].

#### *4.3. Contemporary Directions of Spatial Policy for the Studied Area*

In addition to conservation measures, urban planning has major importance in fostering historical landscapes and managing their future [21]. However, as studies of the surroundings of the Wilanów residence have shown, only part of it is covered by local spatial development plans, which makes it difficult to pursue a coherent spatial policy. The lack of local spatial development plans in some locations has resulted in the division of a valuable natural and cultural area into building plots. Mistakes in local spatial policy have also led to the partial disappearance of manor landscapes in Helsinki [21] and in Aranjuez [32]. A good solution, in the presence of this type of problem, would be to require local plans to be drawn up for all land surrounding historic properties, including agricultural land such as that in Wilanów. Unfortunately, no such requirement exists in Polish legislation to date.

Another observed regularity was that the mere provision in the local plan for agricultural land use does not guarantee the preservation of this function. As a result of lack of use and natural succession, some fragments of historical agricultural land were transformed into wasteland.

#### *4.4. Potential of Historic Agricultural Areas in the Context of Their Potential to Fulfil UGS and IGS Functions, Providing Residents and Tourists with Access to Cultural Ecosystem Services*

Near historic manor residences, arable fields, and wastelands in various stages of natural succession tend to occur together, which makes these areas very attractive places for recreation. The special recreational value of wastelands in various stages of natural succession is pointed out by Brun et al. [45]. The joint presence of these two forms of land use (arable fields and wastelands in various stages of natural succession) also testifies to the disappearance of the agricultural function and to the transformation of the historical spatial context.

The study also concluded that water courses and reservoirs, orchards, meadows, and areas divided into building plots (not yet built-up) or occupied for other functions such as a golf course or formal recreation infrastructure and playground, tend to occur in manor landscape together.

According to the study, building plots (not yet built up) within the manor landscape are near watercourses and reservoirs, orchards and meadows. This indicates that areas containing these types of topography and features are seen as an attractive place to settle, giving the feeling of being 'in the countryside' and 'in the big city' at the same time and providing proximity to recreational areas. It is in line with Zhou et al.'s [51] research according to which city residents prefer nearby locations for outdoor recreation, sports, and passive enjoyment of green landscapes. According to Zhou et al., [51] these kinds of activities are enjoyed more in rural areas.

According to the research, all criteria of aesthetic values (presence and size of spectacular features, vertical structure of vegetation, plant diversity, naturalness, meadows and grassland-like wastelands), all criteria of a sense of place category (preservation level of rural areas, the clear connection to the historic site), presence of protected plant species and two criteria of recreation and ecotourism category (rural character of the area and accessibility of the area for public use) tend to occur together. It shows that areas with aesthetic values provide features that foster a sense of place, which in the case of manor landscape such as Wilanów landscape, is a derivative of a very distinctive character of the area, combining historical traditions of agricultural surroundings of the historic residence and natural values. Building a sense of place is particularly important for the residents of newly created districts and estates such as Wilanów district. As Rędzińska and Szulczewska [26] have shown, inhabitants of the newest part of Wilanów, to a large extent migrants, have problems with defining their local identity.

It was found that areas with a number of recreational infrastructure elements (unpaved field roads, paved walking paths with recreational infrastructure, bicycle paths, platforms and accesses to the water) were also characterized by presence of a shrine or cross and the presence of a vista on religious architecture, conservation status, rarity of the process or phenomenon, presence of protected plant species and vista on a historical architectural element. Thus, the recreational attractiveness of the studied manor landscape and their potential as a source of cultural ecosystem services were also enhanced by their cultural heritage, religious and educational values. The value of landscape, linked to historical residences, was also recognized by a researcher on the landscape of Finnish manorial settings, stating: 'Manor landscapes, with their age and visibility, constitute a substantial part of the heritage of Helsinki's suburbs' [21]. At the same time these areas are very diverse in terms of ownership which makes it difficult to manage them and use as urban IGS.

The research shows that within the manor landscape, such as the studied areas, diverse activities take place. For the most part, the studied areas were not adapted in any deliberate way for recreation and tourism. The clearest form of their development was the network

of field roads, occasionally used by agricultural vehicles and, on a daily basis, by the inhabitants. According to the research, within the areas where those unpaved field roads are present, the activities such as walks, bike riding, jogging, and fishing occur.

In the entire studied area, only one area had a food service facility combined with an outdoor café (the area north of the Wilanów garden and Morysin Park). The attractiveness of the studied areas, however, caused its users to adapt them on their own to the needs of recreation by creating temporary platforms and footbridges, fishing stands and mooring boats at the lake shore, organizing informal picnics by the fires.

According to the cluster analysis, one of the studied areas (Sielanka Lake surrounding) was distinguished from the others. This area had the highest percentage of not yet built-up building plots (mainly privately owned), the lowest percentage of land owned by the City of Warsaw and no state-owned property. Therefore, it has limited accessibility for public use. Research of the area shows that its private ownership, signalled in the precious historic manor landscape by barriers and entry bans, effectively eliminates, despite the lack of fences, any attempt at recreational use of this attractive area characterized by high naturalness.

## 5. Conclusions

Preservation of the historic landscape surrounding is extremely important for the protection and functioning of historic sites [69,70]. Former landowners' residences, of which the palace-garden complex in Wilanów is an example, were traditionally surrounded by lands used for agricultural purposes and, like Wilanów, were often compositionally connected with these areas. Today, the landscape around many historic residences is undergoing significant transformation—usually because of the abandonment of unprofitable agricultural production, which results in plant succession and often in the conversion of former agricultural land into built-up areas. The research showed that it is difficult to protect agricultural areas within the borders of a large city such as Warsaw. Researchers of other analogous sites cited herein believe that the disappearance of manor landscape is a problem on a European scale [27–29]. Researchers note that a social capital approach toward conceptualizing landscape stewardship may be a good solution to this difficult situation [73]. This concept involves the cooperation of all parties involved, specific to the area, based on mutual trust. The concept combines a landscape—related bottom-up approach with “expert” scientific knowledge, resulting in the development of a culture of general trust and cooperation towards landscape and a general commitment in deliberating conflict-resolution practices.

As noted in the preamble of the ICOMOS-IFLA document ‘Principles concerning rural landscapes as heritage’ [74], ‘Rural landscapes are an essential component of humanity’s heritage’. The research on the agricultural landscape of Wilanów showed the weakness of historic monument protection and spatial planning tools in preserving this type of heritage. The relatively strongest form of protection of the historical manor landscape of agricultural genesis turned out to be nature protection in the form of a nature reserve buffer zone.

The study also showed that the historic manor landscape has great potential for providing cultural ecosystem services, which should justify the need for its preservation. This potential is determined by its values: spiritual and religious, those of cultural heritage, those resulting from the potential to carry out functions related to recreation and tourism, educational values, and those resulting from the potential to build a sense of space, to become the source of artistic inspiration and to be a place of social relations.

The research made it possible to indicate the general directions of measures aimed at protecting the potential of historic manor agricultural landscapes to provide cultural ecosystem services, to ensure their territorial integrity, as well as their appropriate use to improve health and well-being of city dwellers. The proposed guidelines are in line with the message of the European Landscape Convention and the idea of the UNESCO ‘Convention concerning the protection of World Cultural and Natural Heritage’ stating that

protection of cultural landscapes can contribute to current techniques of sustainable land use and can maintain or enhance natural values in the landscape.

General guidelines for protection and functioning of the historic manor agricultural areas:

1. At local and supra-local levels, manor landscapes should be identified and acknowledged as an important component of people's surroundings and an expression of cultural and natural heritage.
2. Due to the particular threats to manor agricultural landscapes caused by rapid transformations, changes in functions and reduction of size, the policies should be established at a national level and implemented by local authorities, aimed at manor landscape protection, management and planning, including regional and town planning as well as cultural, environmental, agricultural and economic policies.
3. The procedures for the participation of the general public, local and regional authorities, and other parties with an interest in the definition and implementation of the policies aimed at manor landscapes protection and management should be established. Public participation should be supported by measures to raise public awareness of the value of manor landscapes.
4. Areas of historic manor agricultural landscapes should be treated as a very valuable buffer zone to the historic palace and garden complexes they surround. Their development should serve to enhance the artistic and historical values of the landscape: e.g., by exposing historic architectural dominants and other distinctive elements. Stimulating tourist use of historic manor agricultural landscapes will allow to take over some of the tourists from the historic palace and garden complexes that are very crowded with tourists.
5. Traditional farming landscapes have emerged as highly interconnected socio-ecological systems. However, their historical agricultural function and associated values often conflict with current commercial and social needs. On the other hand, the agricultural use of manor landscapes is the most appropriate in terms of protecting the cultural values of manor landscapes. Strategies should therefore be sought to enable local landowners to continue farming traditions and make them profitable. One option could be the idea of linking food and landscape quality, including the promotion of local products [75].
6. Infrastructure related to tourism and recreational use of historic manor agricultural landscapes should foster social interaction. However, it should be limited to the necessary minimum in order not to cause degradation of artistic, historical, and natural values of such areas.
7. Due to the need to protect the potential of historic manor agricultural landscapes as areas with special artistic, historical, and educational values, and to protect their biodiversity, traditional farming techniques should be promoted within their borders.
8. Historic manor agricultural landscapes can be a source of spiritual, including religious, experiences. Efforts should be made to preserve historic and contemporary elements associated with its spiritual dimension in such landscapes.
9. Historic manor agricultural landscapes play a significant role as a valuable source of knowledge about local natural and cultural resources. It is therefore necessary to strengthen their educational function through activities promoting the values of such areas, directed both to local residents and tourists.
10. For regions with high levels of migration, the historic manor agricultural landscape, with its spatial distinctiveness and multiple values, can be used to shape local identity and a sense of belonging to the area.

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## Appendix A

**Table A1.** Cultural ecosystem services valuation, type of land ownership and form of land use—raw data.

	Sielanka Lake Surrounding	The Area North of the Wilanów Garden and Morysin Park	Morysin Fields	Areas Surrounding Powsinkowskie Lake
Type of Land Ownership				
1. state-owned property	0%	67.3%	96.9%	73.7%
2. ownership of the City of Warsaw	1%	6.6%	3.1%	2.5%
3. other ownership—mainly private ownership	99%	26.1%	0%	23.8%
Form of Land Use				
1. arable fields	0%	45%	76%	30%
2. meadows	15%	4%	0%	3%
3. orchards	0%	0%	0%	25%
4. water courses and reservoirs	1%	14%	6%	9%
5. wastelands in various stages of natural succession	63%	31%	10%	32%
6. areas divided into building plots (not yet built-up) or occupied for other functions	21%	6%	8%	1%
Cultural Ecosystem Services				
1. Aesthetic Values				
1.1. naturalness	3	2	1	2
1.2. plant diversity	1	2	1	3
1.3. meadows and grassland-like wastelands	3	2	0	2
1.4. vertical structure of vegetation	1	3	1	2
1.5. presence and size of spectacular features	1	2	3	3
2. Spiritual and Religious Values				
2.1. presence of shrine or cross	0	1	0	1
2.2. presence of vista on religious architecture	0	0	0	1
3. Cultural Heritage Values				
3.1. historical architectonic or garden element	0	0	1	0
3.2. vista on historical architectonic element	0	1	1	0

Table A1. Cont.

	Sielanka Lake Surrounding	The Area North of the Wilanów Garden and Morysin Park	Morysin Fields	Areas Surrounding Powsinkowskie Lake
4. Social Relations				
4.1. walks	0	1	1	1
4.2. bike riding	0	1	1	1
4.3. jogging	0	1	1	1
4.4. playing on the playground	0	0	0	1
4.5. fishing	0	1	1	1
4.6. meetings by the fire	0	1	0	0
5. Recreation and Ecotourism				
5.1. paved walking paths with recreational infrastructure	0	0	0	1
5.2. bicycle paths	0	0	0	1
5.3. golf course	0	0	1	0
5.4. unpaved field roads	0	1	1	1
5.5. presence of food services activities	0	1	0	0
5.6. presence of platforms and accesses to the water	0	0	0	1
5.7. accessibility of the area for public use	0	3	1	2
5.8. rural character of the area	1	3	2	3
6. Knowledge Systems and Educational Values				
6.1. presence of protected plant species	0	0	0	1
6.2. presence of native plant communities	1	3	1	2
6.3. conservation status	1	1	1	1
6.4. rarity of the process or phenomenon	0	0	1	1
7. Sense of Place				
7.1. preservation level of rural areas	0	3	3	2
7.2. the clear connection to the historic site	0	3	3	0
8. Inspiration for Art				
8.1. source of inspiration for art	1	1	0	1

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