

Article

Gardens as Architectural Heritage of the Bastion Castle Ensemble

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Abstract: Historic gardens are often seen in the context of botanical heritage, which emphasizes their aesthetic and botanical value. Yet, their architectural importance as an integral part of the architectural heritage of the bastion castle ensemble is ignored. Finding the relationship between the castle and the garden is presently complicated by considerable changes in the townscape since the 17th century and the lack of details on these gardens' depictions on maps. The paper demonstrates how historical maps, especially military ones combined with modern on-site analyses can reveal the main architectural types of the gardens in the bastion castle ensemble and show their most important architectural features that should be preserved. The results demonstrate three scenarios in the relationship between the garden and the palace component of bastion castle, their main features, and the challenges facing them. This elucidation of the main features can help to conserve and to valorize plans for the gardens in these ensembles.

Keywords: historic garden; bastion castle; military maps; architectural heritage; typology

1. Introduction

The attempt to uncover the relationship between the castle and the garden is complicated today because much has changed over time, and it is difficult to unearth information about the gardens documented.

However, the gardens were an integral part of the bastion castle ensemble. They had two main types—compound (Figure 1a) and integrated (Figure 1b)—and consisted of two main components—the residence palace and the bastion fortifications—that could be connected either via the composition or by presentation as one complete piece. The ensemble could be enriched by architectural elements such as gardens, chapels, summer palaces, or educational complexes. The article's author argues that all those elements, when used in different circumstances, are crucial for preserving the authentic value of the ensemble, as they create a unique historical and architectural landscape.

Gardens as an element of the architectural landscape in European settings go back to the period when gardens were an integral part of Ancient Roman villas. One of the earliest known gardens is found in Pliny's seaside villa near Rome (circa 100 CE), which inspired Renaissance designers [1] (p. 5). However, this landscape fell into ruin with the fall of the Roman Empire. According to researchers Boult and Sullivan, gardens' simple concept and form were preserved just inside walled structures, such as castles and religious complexes [1] (p.20) during the early Medieval period. The primary function of the early Medieval garden was utilitarian, for food and medicinal plant cultivation, yet they also had aesthetic value, particularly gardens associated with castles [2] (p. 74).

The gardens became a place of relaxation for nobility in the late Middle Ages as a result of economic development [1] (p.21), and their designs reached maturity in villas in the 15th century [1] (p. 57). The noble residential garden of the 15th century opened itself outward to the landscape. It formed an inherent part of *villa suburbana* connecting all elements through geometry, proportion, and use, as promoted by Alberti. The sightlines



Citation: Tikhonova, O. Gardens as Architectural Heritage of the Bastion Castle Ensemble. *Heritage* **2023**, *6*, 1713–1731. <https://doi.org/10.3390/heritage6020091>

Academic Editors: Humberto Varum, Vasilis Sarhosis and Fernanda Prestileo

Received: 10 January 2023

Accepted: 31 January 2023

Published: 5 February 2023



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that connected the garden to the surrounding landscape, and the villa to the city, were crucial contextual references from a humanistic perspective [1] (p. 69). The castle gardens were usually akin to a vineyard or orchards, situated within the castle walls or immediately beyond them [2] (p. 74).



(a)



(b)

Figure 1. Compound and solid structure types of bastion castles. (a) Connected by composition-compound structure type. Bastion castle in Zolochiv. (Source: watercolor illustration by author); (b) Solid—Integrated structure type. Bastion castle in Pidhirtsi. (Source: watercolor illustration by author).

The representation of the landscape as an integral component in the depiction of a painting only became significant after the invention of the horizon and the use of perspective by artistic pioneer Giovanni Bellini (1430–1516) in his paintings [3] (p. 10). This fact explains why we have so little knowledge about gardens' representation before this period.

As an integral part of the bastion castle ensemble, the gardens were first pictured in the paintings of Guisto Utens showing the hybrid villa-castle designs of Villa di Cafaggiolo (1598/99) (Figure 2) and Villa di Poggio a Caiano (1599). Guisto Utens's drawings are the first and only evidence found until now that represents the first built hybrid villas with bastions [4] (p. 39). At the same time, they portray gardens within the ensemble.



Figure 2. View of the Medici Villa of Cafaggiolo with gardens, author Utens Giusto (Source: Gabinetto Fotografico Gallerie degli Uffizi, Inventory Number: 638207).

The theoretical evidence from architectural treatises and books that represents a fully developed bastion castle type model with a garden as a part of the bastion castle first appeared in the engravings of architectural treatises from Jacques Androuet Du Cerceau, “*Les Plus Excellents Bastiments de France*” (1576) [5], and Jacques Perret, “*Des Fortifications Et Artifices. Architecture Et Perspective*” (1601) [6]. In that period, all three components: residential palaces, fortifications, and gardens were developing separately, creating different types and models, but some architects were making ensembles employing the best of each model and combining them into one larger ensemble [4] (pp. 35–38). The references show that the military section developed more rapidly in practice than in theoretical models. After construction, the best effective models were discussed in theoretical treatises, which then propagated these best-practice models across Europe.

Likely, the most ambitious theoretical model of a bastion castle with gardens is Jacques Perret’s design (Figure 3). It is represented by a bastioned fortified wall with gardens placed between the fortified wall and the royal pavilion. Researcher O’Grady assumes this complex was designed to be at the heart of Perret’s 23-sided fortress town plan [7] (p. 146).

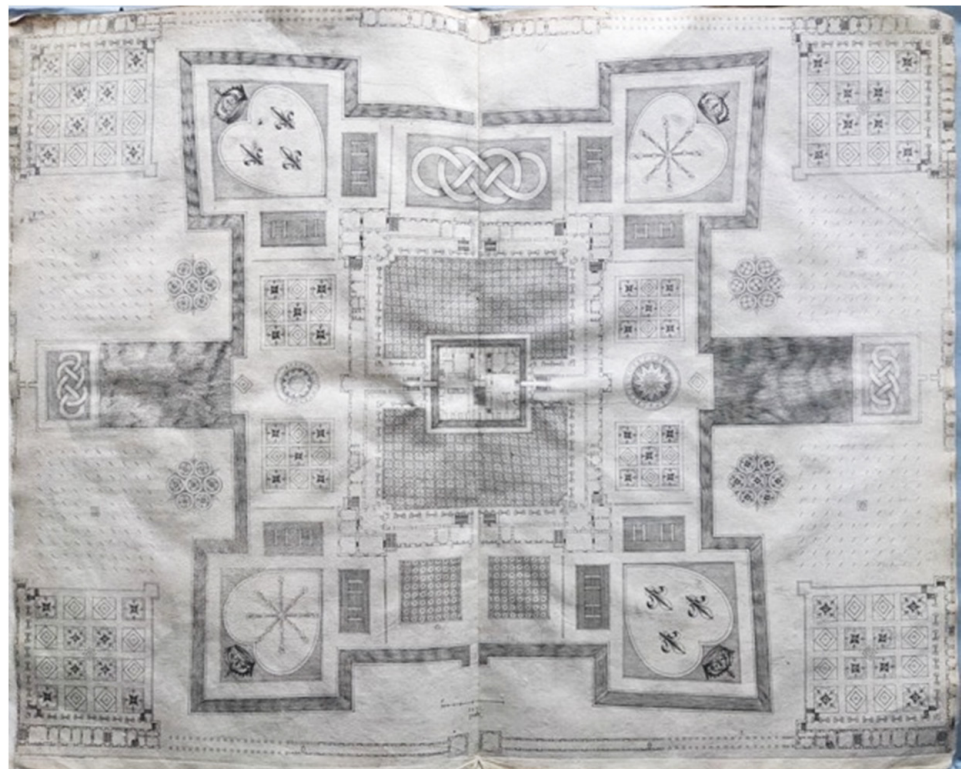


Figure 3. Gardens in the bastion castles in Perret’s treatise “*Des fortifications et artifices. Architecture et perspective*” (Source: French copy of 1601, located at the Library of Warsaw University, call # 28.20.3.8063/3, photo taken by the author on 22 July 2022).

The bastion castles’ most well-known and preserved designs with gardens are the Villa Caprarola (drawing of 1640, held at the Bibliothèque Nationale de France, département Cartes et plans, GE BB-246 (XII, 146–147)) and the Forte di Belvedere with Boboli gardens in Italy (see Figure 4).

As the topic of understanding the bastion castle typology and its elements is a recent concept first raised in the Ph.D. thesis of Tikhonova [8], this work on gardens as part of the bastion castle ensemble is rather novel and discusses this combination for the first time. While many issues remain to be discovered on the topic, this work plans to concentrate on the main typologies of gardens in the bastion castle ensemble and their significant features.



Figure 4. Fortezza di Belvedere with gardens, 1731 (Source: online: public domain crispa.uw.edu.pl. Location of Original: The University of Warsaw Library. Maps Department).

The task of preserving these gardens is complicated when there is no recognition of them as an integral part of the ensemble and no statement about how to define their merit. Defining these historic gardens' authentic and meaningful features and inventorying them should be the first step in preserving and recognizing them as heritage. This article responds to this problem by proposing a detailed methodological workflow for understanding the historic gardens' architectural value within the bastion castle ensemble. It also shows the methodology applied to three case studies of different types to illustrate the approach and possible outcomes.

2. Materials and Methods

The comprehensive methodology chosen for this work consists of four main elements: (1) a survey of the bastion castles with gardens using historical maps, (2) an overlay of the current condition to recognize any historical changes, (3) a sightline analysis to show the connection with the main elements in the ensembles, and (4) the identification of the authentic architectural features (e.g., garden geometry and architectural forms) and challenges faced in the analyzed type of landscape that includes the bastion castle ensemble with gardens (see Figure 5).

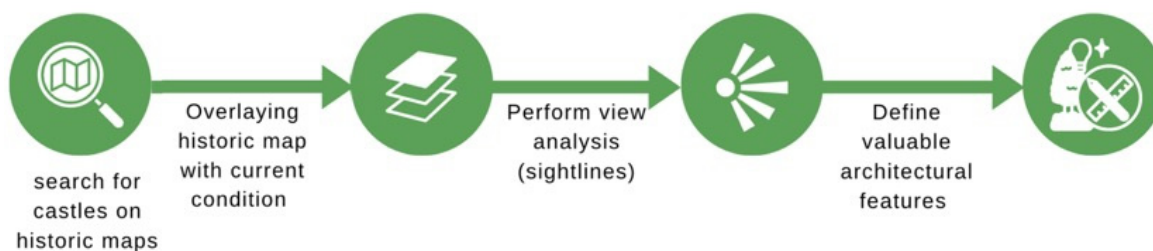


Figure 5. Methodological workflow (Source: Author's diagram inspired by design symbols found on the Canva website).

2.1. Historical Maps Analysis

Historical maps, especially military ones, combined with on-site analysis and historical research can reveal the changes at the site. They can help define the architectural heritage features of the primary garden designs of bastion castles, which currently are often hidden beneath recent transformations. Namely, they can show the main elements of the historic gardens that must be preserved and restored.

As the materials in the historic gardens' documentation are limited, it was decided to collect everything that could help to analyze the gardens in the selected case studies. The information used here comes from different sources for different cases. However, after analysis, it became evident that military maps and on-site analysis were the most helpful in such studies.

Galicia's first detailed cadastral map from the 18th century became the main historical source in this research. Although the mapping of this cadaster had a military purpose, and the cartographer officer, Friedrich von Mieg, ignored the detailed garden depiction, it confirms the existence of the gardens in the bastion castle ensemble, their position, and their general shape. Namely, the garden's general shape was depicted in 6 of the 39 detected bastion castles on this map according to previous research [9]. Specifically, gardens were located in Mariampil, Iavoriv, Horostkiv, Mykulyntsi, Biskovychi, and Pidhirtsi (see Table 1 in research [9]). Also, other more detailed military cadastral maps were found in archives for selected case studies and used here for more precise analysis. However, it is necessary to mention that the historical evidence of only one bastion castle, namely the Pidhirtsi bastion castle, refers to the gardens placed in the same period as the castle [10] (p. 149), [11] (p. 431). The gardens that belong to the other two analyzed cases (Brody and Lodygovice) are depicted on the maps of the 18th and 19th centuries without textual documentation of when they were designed or built.

2.2. Sightlines Analysis Approach

To understand the significance of the gardens in bastion castles, their place in the landscape, and the interrelation between those elements thoroughly, it was decided here to use the approach articulated by Gerrit Smienk and Johannes Niemeijer [3]. Namely, these scholars used sightlines analysis to show the importance of gardens in Palladio's villas. As the bastion castle design comes from the hybrid combination of two parts that follows villa development and military development [4] (p. 34) and includes a garden in its ensemble, this approach will fit the bastion castle ensemble analysis perfectly.

Generally, sightlines analysis is a well-regarded approach for analyzing architectural buildings and is widely used in architecture [12]. It is one of a handful of tools for creating and evaluating architectural design ideas because architectural creation is based on connections, shapes, and orientation. Sightlines analysis, a subset of diagram analysis, uses abstract directional lines and offers insights and inferences that would be more difficult to comprehend without such a graphical representation. A line (sightline) is an abstract concept without a specified location or scale, which approximately identify the relationships and helps to explore, explain, and demonstrate those relationships [12] (p. 3). Researcher Lockard emphasizes that such analysis allows people to see and comprehend [13].

The sightlines reflect the landscape view from a certain point. In an axiomatic formulation of Euclidean geometry, for any two distinct points, there is a unique line containing them [14] (p. 300). For this article, the sight line is represented by the line that passes through the two points, namely the center of the window and the center point of the room.

2.3. Authenticity Value

There have yet to be any specific studies on the authenticity value of the gardens in the bastion castle ensemble, as the studies of bastion castles as a distinct type in architectural theory are relatively recent [8]. However, it is possible to find studies that examined the authenticity value of gardens in the historically formed landscape of other architectural complexes [15,16].

The most important in the matter of defining the historic gardens' value is the ICOMOS Charter "Historic Gardens" (1981) [17]. It states that the architectural composition of historic gardens consists of the elements as follows (Article 4):

- Historic garden plan and topography
- Vegetation, proportions, colors, distances, and heights
- Structural and decorative features
- Water and sky reflection

The Charter [17] also mentions an important fact in Article 7, which says that if the historic garden is associated with a building, it becomes its inseparable component.

As there is no specific article on the authenticity criteria for a bastion castle ensemble with gardens yet, it was decided to analyze several case studies from the UNESCO World Heritage Sites (WHS) list and see which values and authentic criteria were chosen to prescribe them to the WHS.

Several gardens are included in the UNESCO list because of their authentic value. Considering the ones that are included in the UNESCO list and connected to palaces or villas that have similar features to bastion castles complexes [4] (pp. 35–38), we can identify the Palace and Gardens of Schönbrunn in Austria (criteria i, iv) [18] and the Medici Villas and Gardens in Tuscany (criteria ii, iv, vi) [19].

The authentic value of the Palace and Gardens of Schönbrunn is underlined by the untouched structure of the Baroque Park layout and the spatial and visual relationship of the buildings to the park [18]. The emphasis on these features as authentic criteria for the inclusion of the complex with gardens into the WHS list underlines the correctness of the choice of sightlines analysis of the relation between gardens and building for this article's methodological framework to show the authentic value in the ensemble.

The characteristic values for the inclusion of Medici villas with gardens into the WHS list are stated as follows: 'The ensemble is testimony to the technical and aesthetic organization of the gardens in association with their rural environment, giving rise to a landscape taste specific to Humanism and the Renaissance' [19]. The document for inclusion also emphasizes a landscape project, which uses the elements of natural and human intervention for the cultural and artistic purposes specific to the Renaissance and introduces a new aesthetic value, which influenced the design of the landscape at the international level, becoming the reference model used in much of Europe and developed over the following centuries. The Medici gardens are, even today, considered an example and a model of an exceptional formal "Italian-style" garden, a fundamental contribution to the development and the spread of Renaissance art [20] (p. 10).

The authentic value of the ensemble with gardens is the authenticity of the architectural forms and the composition of the gardens [19]. Thus, the compositional organization of gardens is important, namely the geometry and their spatial relation, as well as the use of symmetry and patterns.

Medici's Pratolino Gardens (Figure 6a) and Medici's Boboli Gardens (Figure 6b) are included as separate items but create an ensemble with villas, which are also listed as separate items. Many other villas included in the UNESCO list under the title "Medici Villas and Gardens in Tuscany" also have gardens in the ensemble that create a valuable integrated piece of architectural design. Moreover, the Boboli gardens are located between the villa and the bastion castle (Forte di Belvedere), which, although not included with gardens in the UNESCO protection list, are a part of the ensemble and are in the protection zone. It is difficult to discern why this decision was made to omit the bastion castle from inclusion to WHS as one ensemble, as according to [4] (p. 42), Forte di Belvedere was the refuge in case of an uprising as well as the second residence. It was an integral part of the one complex (palace, bastion castle, and gardens).

Many other villas with gardens included in the WHS list as valuable assets have defensive features and were forerunners of bastion castles. For instance, the Villa-castle at Poggio a Caiano and the Villa-castle at Cafaggiolo are cited as a reference for the origin of the bastion castle in [4] (p. 39).



Figure 6. Medici's Pratolino Gardens and Medici's Boboli Gardens included in WHS: (a) Medici's Pratolino Gardens, author Utens Giusto (Source: Gabinetto Fotografico Gallerie degli Uffizi, Inventory Number: 549971); (b) Medici's Boboli Gardens, author Utens Giusto (Source: Gabinetto Fotografico Gallerie degli Uffizi, Inventory Number: 549964).

Another interesting instance included in the WHS list is a fortified ensemble of Diyarbakır Fortress and Castle. Although the structure emanates from different periods and some sections date to the time of the Romans, it has elements similar to one of the case studies that will be presented in this article, Brody fortress, with a bastion castle and a garden. Namely, it is the joint structure of a citadel (fortified castle) and a ring wall around the city. In the case of Diyarbakır Fortress, the walls include bastions but also have older structures, namely towers on the perimeter. In the Brody instance, the fortification wall has only bastions.

UNESCO recognized the Diyarbakır Fortress with the Hevsel Gardens as a complex with outstanding universal value. It is stated in the document [21] that the whole ensemble has a strong element of integrity, and the link between the elements has been maintained through stringent legal protection [21] (p. 120). The authenticity criteria stated by UNESCO for the ensemble of Diyarbakır Fortress with the Hevsel is the gardens' historical and functional links to the city [22].

In sum, the authentic values that play a crucial role in identifying the ensembles with residences and historic gardens in the UNESCO WHS list are the architectural geometrical layout and compositional spatial and visual relation between the garden and the building.

3. Results

3.1. Identification of the Endangered Gardens' Heritage Value in the Pidhirtsi Ensemble

The construction of the Pidhirtsi stronghold in the Renaissance style with Italian influence was finished in 1640 [23] (p. 10). According to Aftanazy [24] (p. 431), the bastion castle's construction was accompanied by the placement of the gardens with the castle and the landscape in a carefully planned composition. According to researcher Miłobędzki [25] (p. 202), the spatial priority of ensemble organization with the gardens was introduced in Poland-Lithuania for the first time in garden design. The garden is associated with the most fashionable Italian and French models and had no equivalents in seventeenth-century Polish garden art in terms of the spatial perfection of the solution. Miłobędzki states that the creator of this green design was an anonymous Italian, brought by Koniecpolski from Rome [25] (p. 202).

The representative spaces in Pidhirtsi are arranged in a united composition with the gardens and the landscape. The castle has a three-dimensional symmetry in plan and elevation (main and front), highlighted by the symmetry of the front and back garden. The raised *piano nobile* of the main corpus of the Pidhirtsi bastion castle has axially oriented vistas.

When one approaches the castle from the front, the terrain seems flat, with the trees placed in two rows leading the visitor to the castle (Figure 7). The person can fully

experience the beauty of the front garden either from the platform above the bastions on the level of *piano nobile* that, apart from military function, serve as a viewing terrace or from the second-floor balconies.



Figure 7. View towards Pidhirtsi bastion castle from the principal road, through an alley with the trees that frame the view (Source: Author's photo taken on 1 November 2021).

In contrast to the frontal view, the view from the rear part is intimate, directed towards the main gardens and framed by trees and a slope behind the castle. The panorama of this rear side (Figure 8) should be a determining factor in placing the most beautiful gardens in the rear.



Figure 8. The scenery from the rear side of Pidhirtsi bastion castle (Source: Author's photo taken on 1 November 2021).

The view that opens from the rear part of the Pidhirtsi castle is directly connected to the rear garden on all levels (Figure 9). The upper levels in the front façade have an open view toward the front gardens, but the protruding bastioned platform in front of the palatial body creates a sensation of remoteness. Thus, the overview of the nearby garden is sufficient only from the second floor of the main palatial part, namely the balconies. This fact could explain why the rear garden has received greater attention and was more detailed, as it has a better overview of the civil part of the bastion castle on all levels in contrast to the front gardens. However, the military viewpoint could also play a role here, as the rear garden was more protected than the front one (Figures 9 and 10). In contrast to a flat space leading from the main road to the front entrance of the bastion castle of Pidhirtsi, its rear part has a steep slope framed by trees at the lower levels, which limits the possibility of attack from this side.

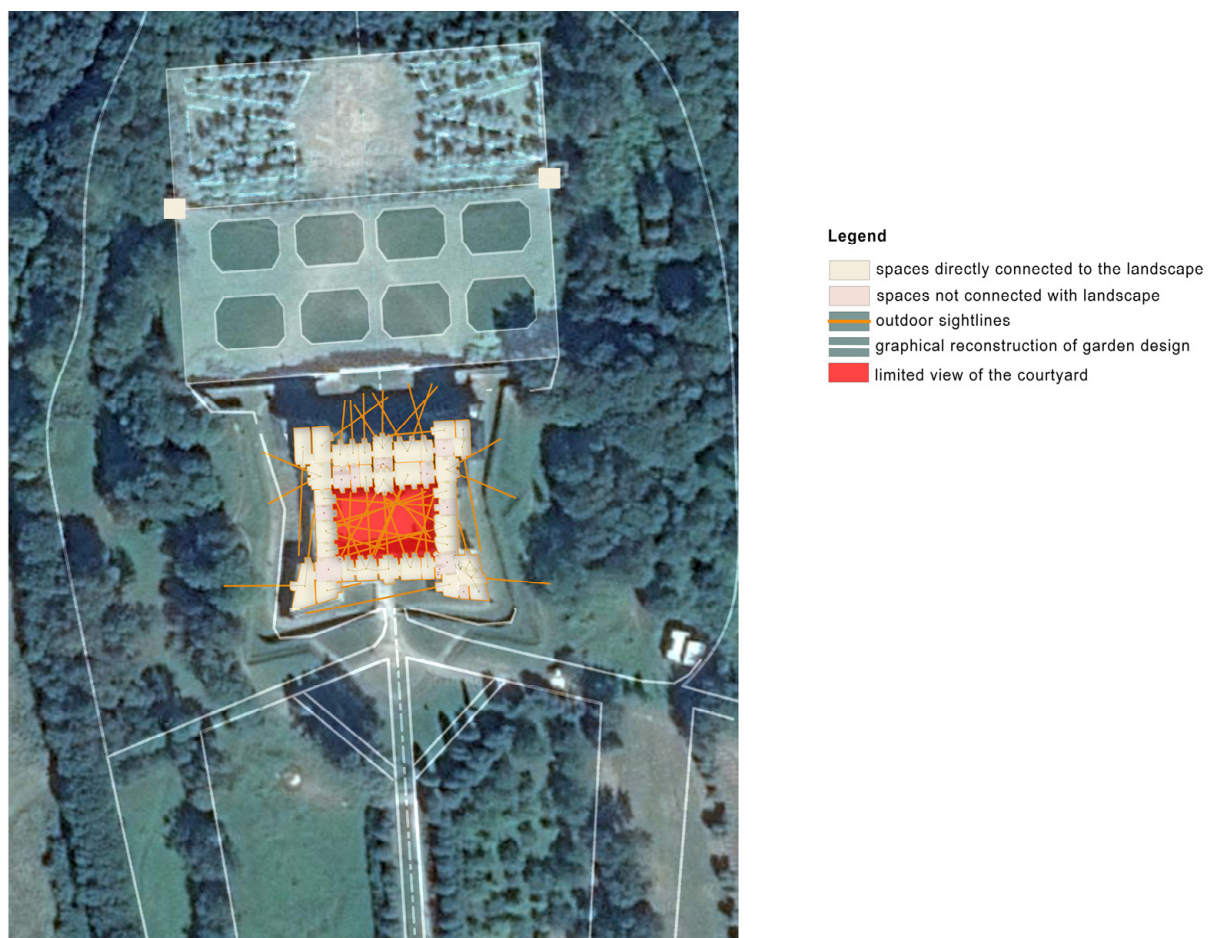


Figure 9. Overlapping of the Pidhirtsi bastion castle ground floor schematic layer sightline analysis and the Google Map satellite view to show the relationship between the indoor spaces and landscape. The figure shows the limitation of the view from the ground floor; the view from the windows is limited to a courtyard. The most vital links are in the rear garden and limited courtyard space. (Source: Model of Pidhirtsi bastion castle internal structure with sightlines made by the author, aerial satellite image taken from Google Maps. Theoretical reconstruction of the gardens (white lines) based on Adam Milobedzki's theoretical reconstruction proposal [25] (p. 200)).

Also, the spaces in the corner towers of the rear part of the *piano nobile* have access to the bastioned platforms that could serve as balconies, not only as defensive points but as places that open outward toward a great view of the rear gardens.

We can find some similarities with the placement of gardens in Palladian villas, namely Villa Barbaro, Maser (1557–1558), and Villa Godi Malinverni (1542). As in the Pidhirtsi villas, Godi and Barbaro have two gardens: one in front of the house, an open garden with a similar semi-circle space in front of the entrance with a division of the front garden into two parts as in Pidhirtsi (Figure 11a–e), and one private (hidden) garden in the rear framed by trees (Figure 12a–c).

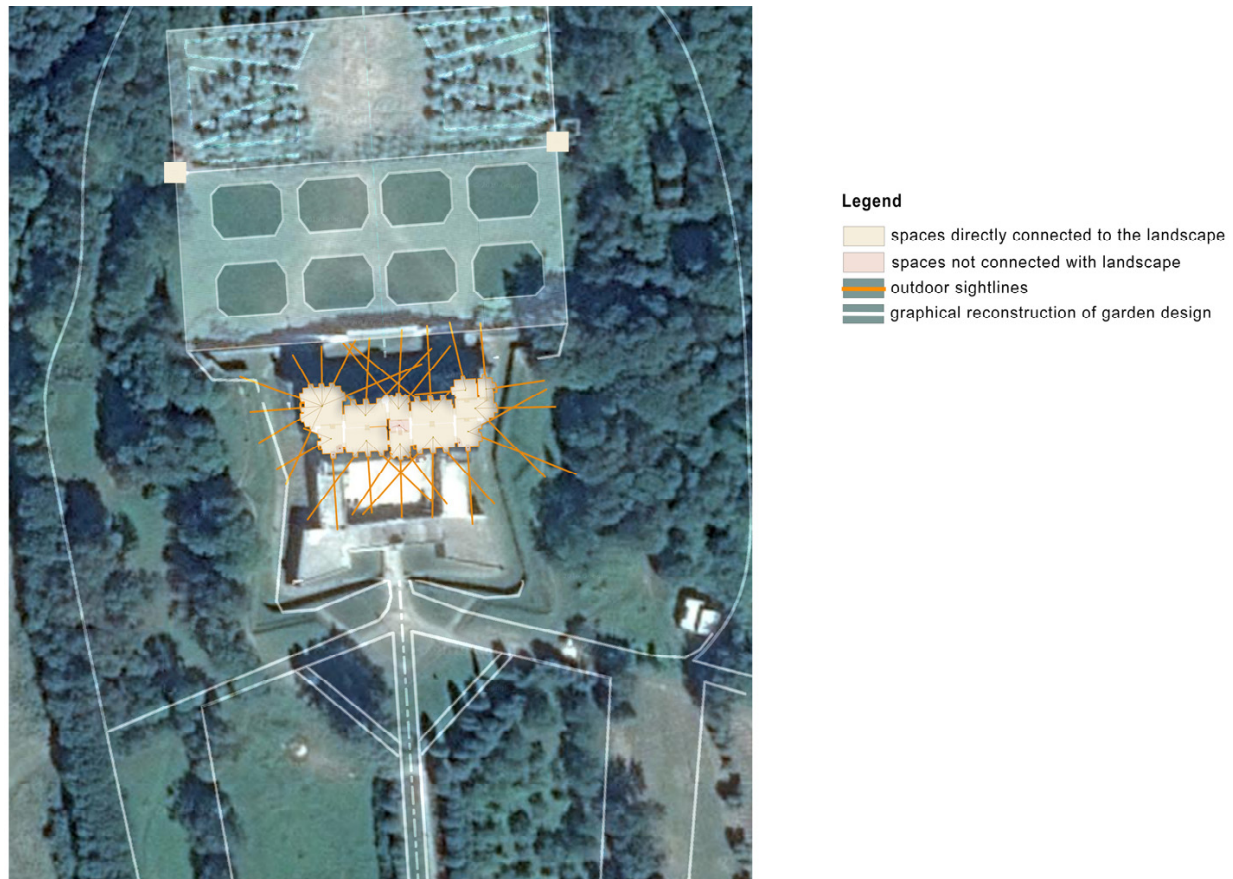


Figure 10. Overlapping the first-floor schematic layer of Pidhirtsi bastion castle with outdoor sightlines and the Google Maps satellite view to show the relation (openness) between the indoor and outdoor spaces. (Source: Model of Pidhirtsi bastion castle internal structure with sightlines made by author, aerial satellite image taken from Google Maps. Theoretical reconstruction of the gardens (white lines) based on Adam Milobedzki's theoretical reconstruction proposal [25] (p. 200)).

When studying Pidhirtsi castle's gardens, it is impossible to omit the similarities in composition with one of the most well-known examples of a bastion castle: Villa Caprarola, which also has a solid symmetrical layout that relates the main corpus with the surroundings (Figure 13). As in Caprarola, the symmetry of the main corpus in Pidhirtsi is highlighted by bastions on both sides that accentuate the central axis, projecting the landscape image into the central part and thus framing the castle's vista. Pidhirtsi's central section introduced the main axis of the castle into a plan, which became the principal axis of the whole ensemble organization. As at Caprarola, Pidhirtsi has a trapezoidal space in front of the castle. However, Pidhirtsi's front space is much bigger than Caprarola's. As in Caprarola, Pidhirtsi has two gardens in the rear. However, in contrast to Caprarola, where the gardens are placed next to each other (related to the sides of the castle), the gardens were placed back-to-back at Pidhirtsi.



Figure 11. The comparative scenery of the front gardens: (a) The front garden of Villa Godi (view from the Villa) (Source: author's photo taken on 1 September 2022); (b) Front garden of Villa Barbaro, towards the villa (Source: author's photo taken on 4 September 2022); (c) Front of Villa Barbaro, from the villa (Source: author's photo taken on 4 September 2022); (d) Front view towards Pidhirtsi bastion castle from the principal road, through an alley with the trees that frame the view (Source: author's photo taken on 20 February 2016); (e) Front view from Pidhirtsi bastion castle (Source: author's photo taken on 1 November 2021).

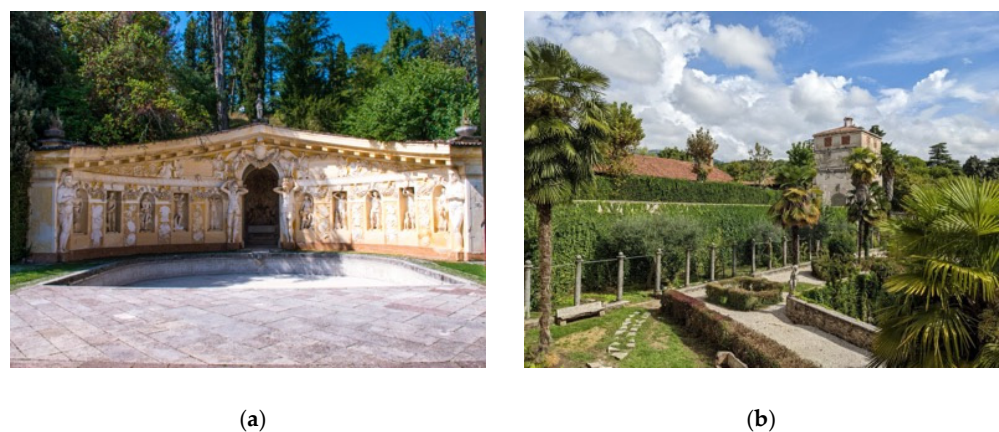


Figure 12. *Cont.*



(c)

Figure 12. The comparative scenery of the back gardens: (a) Back garden of Villa Barbaro, from the villa (Source: author's photo taken on 4 September 2022); (b) Back garden of Villa Godi (view from the Villa) (Source: author's photo taken on 1 September 2022); (c) Back garden of bastion castle of Pidhirtsi (Source: author's photo taken on 1 November 2021).

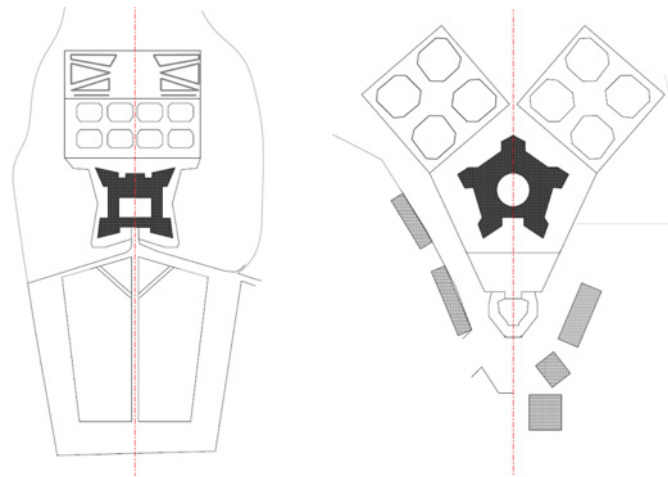


Figure 13. Comparison of the compositional organization of bastion castles with gardens in two cases: Left: Pidhirtsi compositional organization (author's scheme based on Adam Milobedzki theoretical reconstruction proposal [25]. Right: Villa Caprarola (author's scheme based on the current situation using the Google Maps satellite image as a source).

3.2. Identification of the Endangered Gardens' Heritage Value in the Brody Ensemble

The castle in Brody does not mention the gardens in historical written documents. However, two very detailed maps from the 18th century can be used for the gardens' analysis. Those maps are stored in Vienna State Archive's Military Department (Call Number: Inland C: VI). The first map dated 1775 (Figure 14) is more detailed than the second map, from the 1780s. The 1775 map shows detailed vegetation (trees and grass in green) and the roads (in brown). According to the maps, there were no gardens on the territory inside the bastion castle walls. The courtyard had several trees forming a

circle in front of the palace. The same representation of a circle with trees is present on the less-detailed map from the 1780s. Also, it is possible to see some vegetation on Ist and Vth bastions on the 1775 map. The road meanders through the castle's territory in a freeform manner from the palace to the gate, which affirms that there was no regular garden in the courtyard.

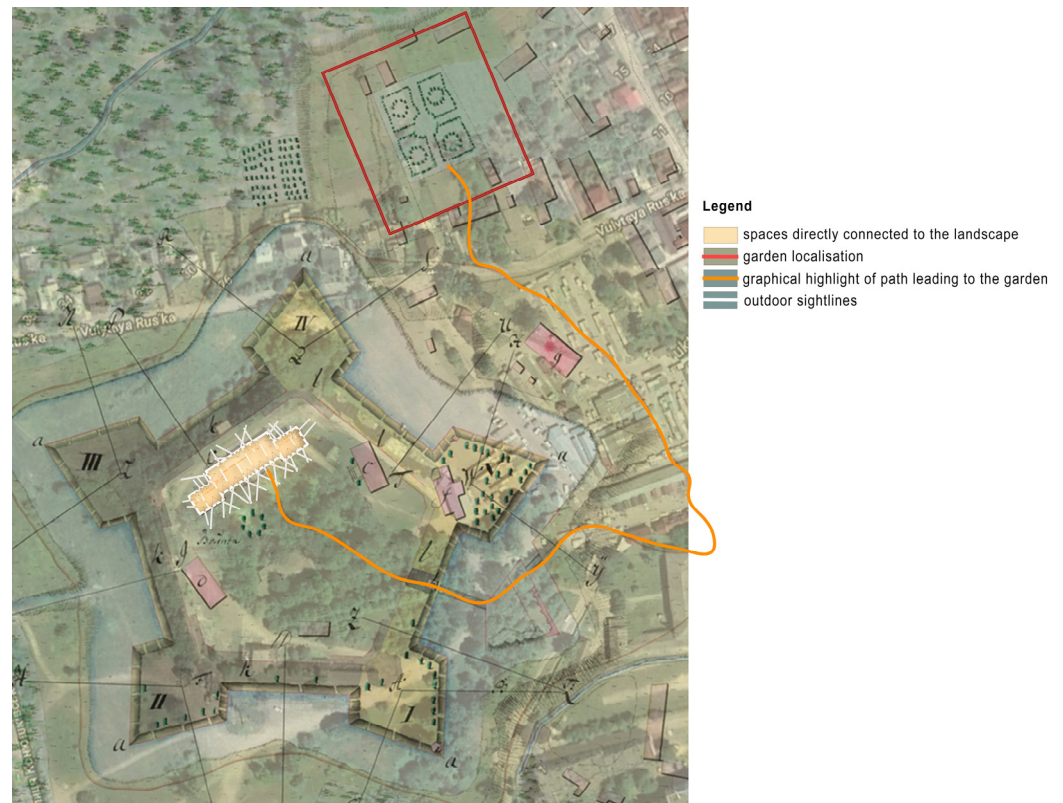


Figure 14. Overlapping the historical map of Bastion castle ensemble with a garden in Brody with Google Maps and sightlines analysis model of the palace (Source: Made by the author based on Google Maps satellite imagery and the historic plan of the castle with inner spaces of the palace, located in the Vienna Archive, Military department under the call number Inland C: VI).

Both plans show only one garden next to the bastion castle (Figure 14). The drawings lead the viewer to assume that this garden belongs to the castle because the road from the palace through the courtyard that leads outside the castle finishes at the garden. However, as seen from the picture in Figure 14, the direction of sightlines in the palatial building was not directed toward the garden. Some of them were directed toward the defensive curtain and others toward the courtyard. As such, it is possible to state that a palace was not visually connected with the garden. However, this placement of the garden next to the castle without a direct visual connection was a widespread model of the relationship between the castle and a garden in France. Because the space in the castle was limited and usually irregular, making it hard to fit a regular Italian garden, the gardens were placed on adjacent properties not directly linked to the residence. It is possible to find many such examples in the engravings of Jacques Androuet du Cerceau's book "*Les plus excellents bastiments de France*" [5]. A great example is Verneuil's first design of a bastion castle with a garden [5] (p. 108). Verneuil has a garden outside the bastioned castle structure on the adjacent territory. Another example is Château de Chenonceau, located on the river Cher, in which the gardens are placed on the opposite side of the river in front of the castle.

3.3. Identification of the Endangered Gardens' Heritage Value in the Lodygovice Ensemble

Two gardens are indicated on the cadastral map of Lodygovice village inside the walls of Lodygovice bastion castle, which unfortunately have not been preserved to the present. Researcher Jerzy Szablowski [26] (p. 118) supposes that those gardens come from the same period as the bastion castle. The garden complex consisted of two separate rectangular gardens placed next to each other with some distance in-between them, on the right side from the entrance (Figure 15). Both gardens had rectangular divisions. The one closer to the entrance had trees and probably served as a front garden; the second appears more “private” and was located behind the palace. The second garden resembles an Italian secret garden (*giardino segreto*) adjacent to the building and hidden behind the trees of the first garden. It has the features of a “private” garden, the view of which opens up from the largest room in the back of the house. It is also visually connected with one more space in the back section, perpendicular to the bigger room (Figure 15). Those two rooms create an L-shaped corner that frames the garden. From the other two sides, the garden is bounded by the curtain walls of the bastion castle. This structure visually interprets the garden as an additional room of the house, one open to the sky. Perret's gardens, as in Figure 3, can be an excellent theoretical reference to the garden in Lodygovice because both instances have their gardens between the bastion fortification's outline and the main residential building.

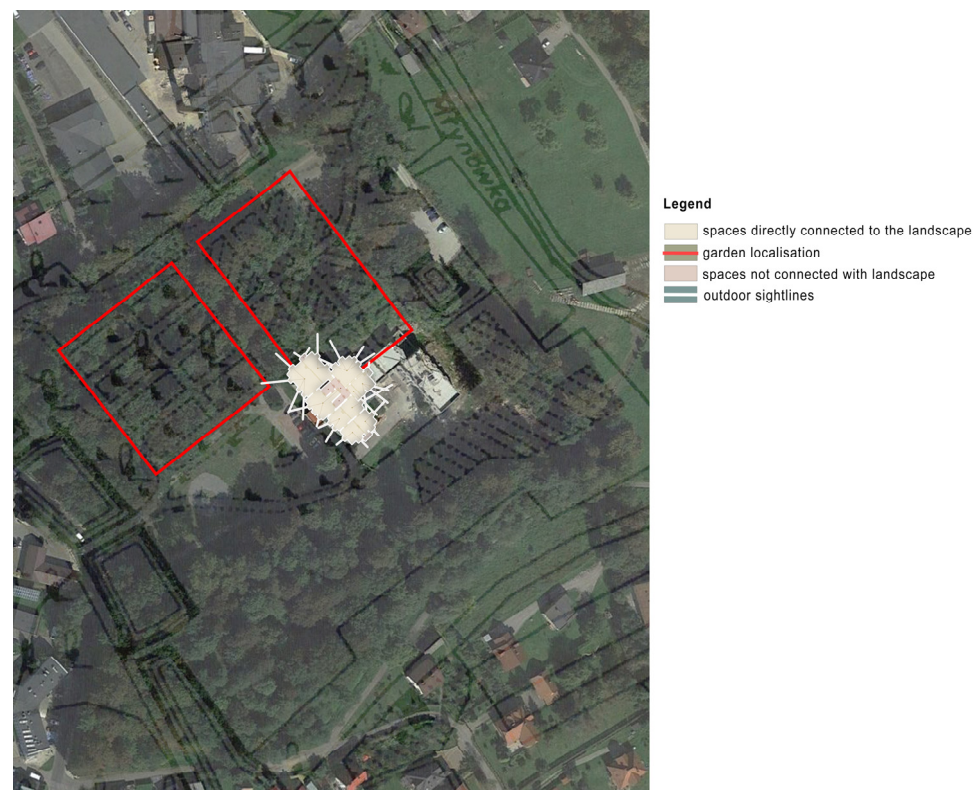


Figure 15. Overlap of the historical map of Lodygovice bastion castle from 1844 [8] (p. 107) with Google Maps aerial photo and sightlines model (Source: Made by author).

4. Discussion

4.1. Current State and Challenges in the Pidhirtsi Ensemble

This ensemble is an absolute masterpiece with excellent potential, but it requires good funding and a proper management plan for the rehabilitation project.

As we can see from the satellite view of the Pidhirtsi bastion castle in Figures 9 and 10, the general outlines of the gardens are still preserved but not well maintained (see Figure 16). The organic link to the beautiful mountain landscape with garden restoration can be used to improve the attractiveness of the site for tourists. In this case, the biggest obstacle that

limits the reconstruction of the gardens is the lack of funding, which leads even to more urgent tasks facing the owners. Namely, the whole structure of the bastion castle is in danger of falling apart as the land under the rear part of the castle slides downward and takes the masonry wall with stairs down with it (see Figure 17).



Figure 16. The current state of the rear garden in Pidhirtsi bastion castle (Source: photo taken by the author on 1 November 2021).



Figure 17. The current state of Pidhirtsi bastion castle's rear stairway (Source: photo taken by the author on 1 November 2021).

4.2. Current State and Challenges in the Brody Ensemble

The example of the Brody ensemble is a valuable monument, as it is a rare example of “ideal city” planning. In such a structure, we have the complex that consists of the citadel connected to a fortified city. In this case, the ensemble is also linked with the garden. this type brings a new landscape dimension to modern perceptions of the city but also has many challenges.

Although the Brody ensemble has national protection status (No. 401/0) and is owned by the Ukrainian state, the entire complex is in a poor condition. The greatest destruction and theft occurred during the world wars. The bastion castle premises were used for different purposes during World War II. Namely, warehouses, a prison, a coach repair plant, and a military unit [27] (p. 68) all existed within the bastion castle's walls during the Soviet occupation of Ukraine between 1939 and 1941. Only remains of ramparts and casemates of the bastion castles survived from the military section of the ensemble from the seventeenth century (Figure 18).



Figure 18. Comparative analysis of Brody's historical and current state (Source: author's work): (a) Historical cadaster based on a city plan reproduction from 1780 stored in Vienna State Archive, Military Department, Call Number: Inland C VI. The author of the map is Louis de Jann; (b) Current state based on a free BBBike map extract from March 2021 (<https://extract.bbbike.org> (accessed on 1 March 2021)).

The inner courtyard of the castle is currently full of random vegetation. The location of the former garden currently is in private hands, as seen in Figure 14. The restoration of the entire ensemble with the garden in this scenario will be challenging and costly, as it will be necessary to reach a broad agreement on the planning regulations to preserve critical views and regain the territory of the lost garden. The only way is to buy the land where the garden was located and fully rehabilitate the complex, as was done in the restoration project launched by Guardia di Finanza at Italy's Fort Aurelia in 2017 and 2018 [28]. Another, less costly possibility is to create a virtual 3D reconstruction and show it inside the castle museum complex as a reminder of the great loss.

4.3. Current State and Challenges in the Lodygovice Ensemble

As we can see from the recent photos (Figure 19a,b), there is a park at the location of the historical garden depicted on the 1844 map. The garden's historical boundaries are not visible, but it is still possible to restore this garden. The building complex underwent a complete renovation between 2018 and 2019 [29], but the garden outline with regular rectangular divisions was not restored. However, this example will be the easiest and the cheapest to repair the three cases studied here. It has a tremendous potential to regain its splendid design, as it was smaller in size originally. Moreover, the central building part has already been restored; only the bastions and the gardens await their turn.



Figure 19. The current state of gardens in Lodygovice (Source: Photos made by Natalia Novosadova on 7 September 2021). (a) North view towards the palace; (b) South view towards the palace.

5. Conclusions

Restoring the gardens in bastion castle ensembles can be a potential magnet for the region's sustainable development. They could become a fascinating tourist attraction when well-maintained and authentically restored. Unfortunately, the original gardens in all three analyzed cases are not sufficiently preserved. They suffered damage and neglect resulting from the lack of management and funds. It is crucial to rediscover the hidden potential of those sites as the gardens represent an integral part of the architectural ensembles created in the 17th through the 19th centuries, as was proven in this work. Preserving the main authentic features of the garden composition as an architectural heritage component of these examples is essential today, as the changes in ownership and function of the bastion castle ensembles have frequently caused the loss of the primary architectural design of the gardens and the landscape. In many cases, some of which were presented here, the gardens became used as private green areas or built upon. Adapting the outline to the current needs of green spaces was done without considering the primary design. The garden transformations are characterized by spontaneous openings of new paths or total neglect of the garden design.

Although the interaction between the bastion castles and the gardens is performed in different ways in these case studies, it is dictated to a great extent by the spatial organization of the bastion castle. The most robust relation of gardens with spatial organization of the inner spaces of the bastion castle is seen in the Pidhirtsi and Lodygovice bastion castles. In contrast, the castle in Brody has only a minor connection.

Namely, after analysis, it is possible to trace three different scenarios of the relationship between the garden and the palace:

- The garden is placed outside the bastion castle walls and has no compositional link with the palatial section, as in the ensemble of bastion castle of Brody.
- The gardens are placed outside the walls with solid compositional links with the palace, as in the Pidhirtsi bastion castle ensemble.
- The gardens are placed inside the bastion castle walls with a solid compositional link to the palace, as in the Lodygovice bastion castle complex.

Regardless of the type, the gardens in each case are part of the historically formed ensemble and, according to Article 7 of the ICOMOS Charter [17], are an inseparable component of the building complex. Their authentic value can be found in the initial

design layout and the spatial and/or visual relationship of the buildings to the park. Thus, such historic gardens feature in the bastion castle ensemble as the geometry and spatial relationships, as well as the use of symmetry and patterns, and the garden compositional relation to the bastion castle should be preserved.

Moreover, the Pidhirtsi bastion castle garden has the same value as the Tuscany gardens in Medici's villas included in the WHS list, albeit on a smaller scale (the territory of the Republic of Poland) as it is a testimony to the first technical and aesthetic organization of the garden associated with the residence in the Poland-Lithuania, according to researcher Miłobędzki.

Funding: This project has received funding from the European Union's Horizon 2020 research and innovation program under the Marie Skłodowska-Curie grant agreement No 847639.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: Not applicable here.

Conflicts of Interest: The author declares no conflict of interest. The funders had no role in the design of the study; in the collection, analyses, or interpretation of data; in the writing of the manuscript; or in the decision to publish the results.

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