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1. M.A. Student in Historic Buildings Conservation and Restorations. Art University of Isfahan, Isfahan, Iran. Email: Nayer_21_ha@yahoo.com

2. Associate Professor, Department of Historic Buildings Conservation and Restorations, Art University of Isfahan, Isfahan, Iran. *. Corresponding Author. Email: s.nasekhian@aui.ac.ir

3. Associate Professor, Department of Archaeology, Tarbiat Modares University, Tehran, Iran. Email: s.amirhajloo@modares.ac.ir

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RESEARCH ARTICLE

Spatial Organization and Cultural Landscape of the Historical Ja'farabad Garden-Castle, Ashtian: A Conservation-Oriented Study

Nayyer Hajitaher[1], Shahriar Nasekhian[2*], Saeed Amirhajloo[3]

Abstract

The garden–castle or Qal'eh Ja'farabad in Ashtian is a prominent example of the integration of defensive, residential, and cultural landscape architecture within rural contexts in Iran. Historically, this aristocratic complex functioned not only as a protective and administrative center but also as a component of the village's agricultural system and economic life. In addition to this castle, other structures, including the peasant castle and the historical bathhouse, collectively reflect the spatial organization and hierarchical arrangement of residences and services during pre-modern periods. This study aims to examine and analyze the spatial and physical structure of the garden-castle of Ja'farabad from a conservation-oriented perspective. Data were collected through field surveys and historical documents, and data were analyzed using documentary content analysis, spatial analysis, and comparative analysis methods. The findings indicate that, due to its strategic location, vernacular architectural structure, and connection with the historical socio-economic system, the complex embodies multi-layered cultural, historical, and landscape values. At the same time, natural erosion, functional changes, and the absence of protective programs have led to its gradual deterioration. Accordingly, this paper proposes conservation strategies, including complementary studies based on damage assessment and structural analyses, as well as interventions guided by an integrated approach grounded in architectural conservation principles and sustainable development. These strategies are organized along three axes: physical (structural) interventions, participatory management, and compatible, meaningful reuse. Finally, monitoring of the Ja'farabad garden-castle should involve continuous long-term surveillance, with simultaneous maintenance of all elements, including structures and vegetation. Professional management and the training of local specialists are also essential to ensure the long-term sustainability and preservation of the complex.

Keywords: Garden-Castle, Ja'farabad in Ashtian, Rural Architecture, Landlord Castle, Conservation

Introduction

Ja'farabad Village, located in Ashtian County, Markazi Province, exemplifies a historical settlement distinguished by its notable architectural heritage, particularly its castles, with the aristocratic castle forming a distinctive garden-castle. This complex integrates defensive architecture, residential units, and traditional Iranian gardens, embodying the region's cultural identity and historical patterns of rural settlement. In recent decades, however, the site has experienced progressive deterioration. Considering that rural development in Iran has often proceeded with limited regard for cultural and historical values, there is a critical need to systematically document, analyze, and develop conservation strategies to preserve and revitalize the village's historical structures and spatial organization.

This study uniquely combines field survey data, aerial photography, and spatial analysis to systematically document and analyze the Ja'farabad garden-castle, addressing a gap in existing scholarship that has largely focused on other Persian garden-castles. By linking architectural and landscape features to socio-economic patterns and proposing evidence-based conservation strategies, the research contributes a novel methodological and practical perspective to rural heritage studies in Iran.

This study aims to identify and analyze the spatial organization, landscape system, and historical values of the garden-castle in Ja'farabad, Ashtian, in order to propose effective strategies for its conservation. The study and preservation of this castle as a notable example of the integration between architecture and cultural landscape can make an important contribution to understanding historical settlement patterns, reinforcing local identity, and promoting sustainable rural development. Through detailed documentation of the current condition, along with historical and spatial analysis, and the formulation of conservation and restoration strategies, this research contributes to safeguarding rural heritage and its transmission to future generations.

This study addresses two principal research questions: What are the architectural and landscape characteristics of the Ja'farabad garden-castle? And what conservation strategies are appropriate for its preservation in accordance with its historical values and rural context? Accordingly, the following hypotheses are formulated: The Ja'farabad garden-castle exhibits a distinctive spatial and architectural configuration shaped by the climatic, defensive, security, and socio-cultural conditions of its period, representing a unique example of defensive rural architecture. By utilizing local cultural, touristic, and social potentials, the castle can function as an active element in revitalizing the village's identity and promoting sustainable regional development.

Data collection was conducted through both field surveys and archival/documentary research, and the study was carried out using a descriptive-analytical approach. Accordingly, baseline data were collected through field surveys and site visits, accompanied by both photographic and written documentation of the site. Subsequently, textual and documentary sources, including both contemporary and historical references, were consulted to supplement the baseline information. Following this, data were analyzed using historical source content analysis, spatial analysis, and comparative analysis methods.

Spatial analysis was conducted using both quantitative and qualitative methods. These methods include plan-based measurements, including calculation of open-to-built ratios, courtyard hierarchy, axial circulation patterns, and spatial accessibility mapping. The relationships between primary, secondary, and service spaces were examined using functional zoning and morphological comparison with five Qajar-period houses in Ashtian.

Literature Review

Research on Iranian garden-castles, particularly regarding their conservation and physical composition, remains limited within the architectural and cultural heritage scholarship. Nevertheless, studies on Persian gardens, aristocratic or landlord castles, and historical landscapes provide a robust foundation for understanding the structure and significance of garden-castles. Khansari *et al.* (2006) present a comparative typology emphasizing the interplay between nature and architecture, establishing a theoretical framework for spatial analysis of such complexes. Mahmoudi Farahani *et al.* (2016), in *"Persian Gardens: Meanings, Symbolism, and Design,"* examine the physical, symbolic, and climatic dimensions of Persian gardens, analyzing the *Chaharbagh* layout as a historically and culturally meaningful model.

Regionally, Haji-Taher (2021) investigated Qajar architecture in Ashtian, analyzing both the landlord and peasant castles of Ja'farabad and assessing the influence of climatic conditions on their forms. A subsequent study by Haji-Taher *et al.* (2024) further explored the spatial configuration of these castles within their geographical context, highlighting Qajar-era settlement patterns. Comparative research, including Gachkar *et al.* (2022) on Bagh-e Biruni in Urmia, Mohammadi and Rezaei (2021) on landlord castles in the Hamadan plain, and Asadpour (2020) on Bagh-e Nazar in Shiraz, provides insights into architectural, functional, and socio-cultural aspects, emphasizing the importance of conservation.

Sarshough's master's thesis (2016) underscores the significance of cultural values, collective memory, and historical layers in the restoration of garden-castles, advocating for a multidisciplinary conservation approach. Similarly, Hanif (2025) interprets Persian gardens as both climatic-architectural entities and reflections of power, ideology, and collective memory. While no prior independent study has specifically focused on the Ja'farabad garden-castle, the existing scholarship provides a comparative and theoretical basis to inform its analysis.

This study represents the first systematic investigation of the Ja'farabad garden-castle within the historic village of Ja'farabad in Ashtian, employing field surveys, physical analysis, and comparative methods to address gaps in documentation and conservation of this unique heritage site.

Study Area

Ja'farabad Village is located 24 km south of Ashtian, at an elevation of 1,780 meters (Hazrati Ashtiani 2020: 98), within the Central District of Ashtian County, Markazi Province. The county encompasses three rural districts: Mazra'eh-ye Now, Siyavashan, and Garkan (Hazrati Ashtiani 2020: 95), with Ja'farabad located in the Siyavashan Rural District (Figure 1). The historic core of the village developed around the landlord and peasant castles, with subsequent expansions radiating from these structures. Consequently, Ja'farabad exemplifies a castle-

villages settlement pattern, in which rural castles serve as the nucleus for village formation. Both castles date back to the Qajar period and, despite their considerable historical and cultural value, have not been officially registered as national heritage sites. Their positions are illustrated in a 1968 aerial photograph (Figure 2), showing the castles in close proximity to one another, situated to the north and south of later residential developments.

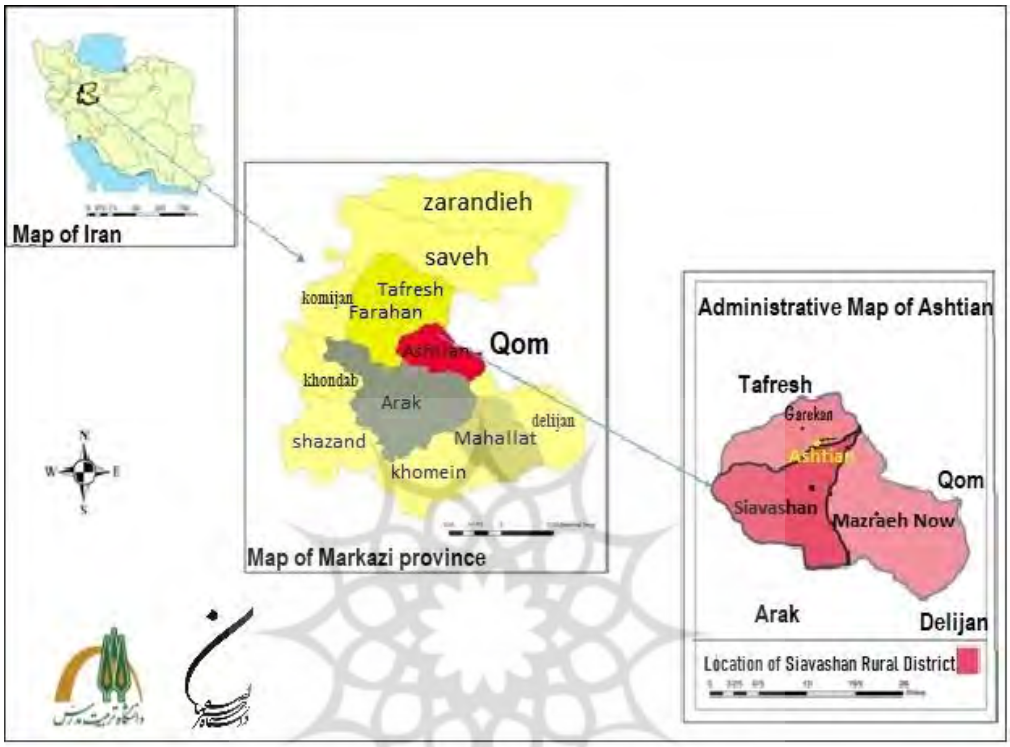

Figure 1. Administrative divisions of Ashtian County and the location of Siyavashan rural district (Photo by Authors 2021).

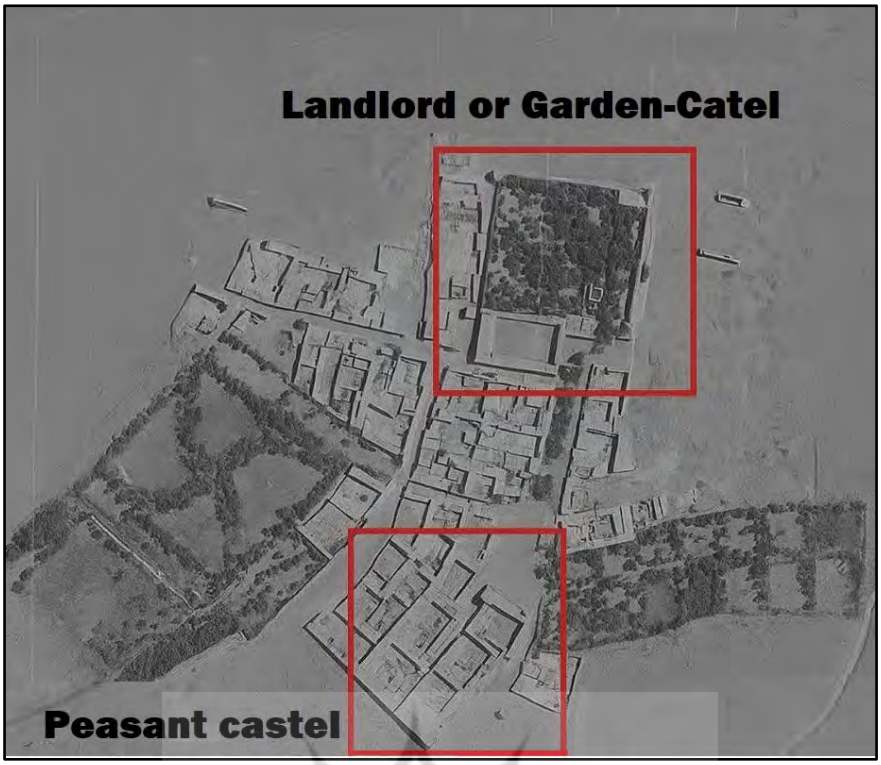

Figure 2. Location of the landlord and peasant castles of Ja'farabad (After: National Cartographic Center of Iran 1968).

Geographical and Climatic Characteristics of Ja'farabad Village

Ja'farabad Village is geographically bounded by the abandoned Safarabad Village to the west, Dastjerdeh Village to the northeast, Davoodabad City to the south, and Feyzabad Village to the north and northwest. The village experiences a relatively cold and dry climate and is situated on predominantly flat terrain. Located 20 km southwest of Ashtian city, the primary access route is the asphalted Ashtian–Siyavashan–Davoodabad road, with an alternative route via the Arak–Davoodabad–Ashtian road (40 km). The surrounding pastures, traditionally known as the Ja'farabad pastures, have been communally used by local herders (39 individuals) for grazing. A qanat system runs alongside the village and within the Ja'farabad estate, providing irrigation for agricultural fields and gardens, as well as water for livestock (Anonymous 2024: 18–19) (Figure. 3). According to provincial data from the Natural Resources and Watershed Management Office, the Ja'farabad qanat consists of 150 well shafts, with a flow rate of 8 liters per second, irrigating approximately 5 hectares of farmland.

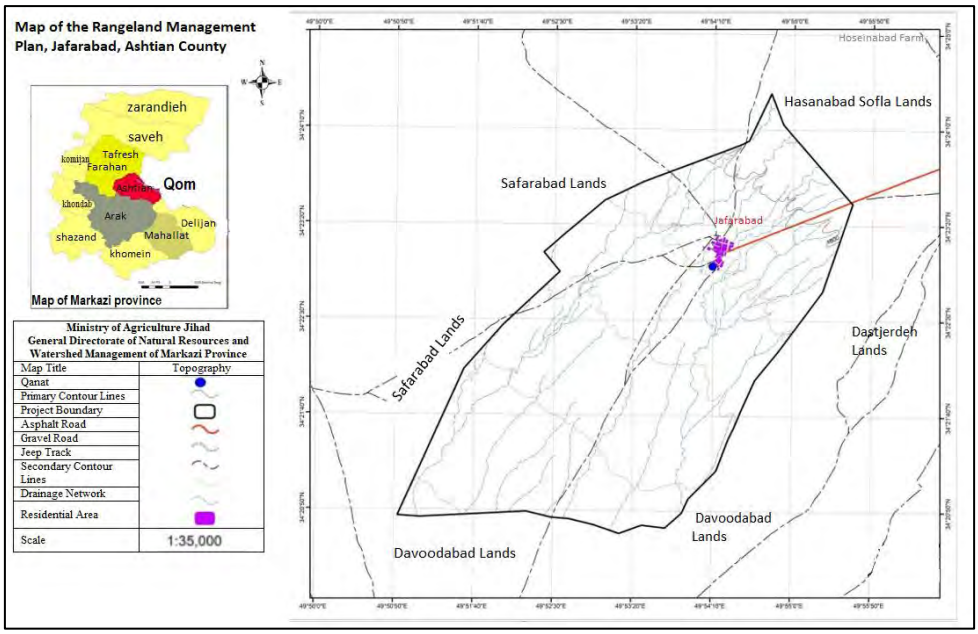

Figure 3. Landscape of Ja'farabad (Anonymous 2024).

Historical Characteristics of Ja'farabad Village

A pivotal historical episode in Ja'farabad Village was the settlement of Mirza Zeyn-al-Abedin Khan (Rafiei), the deputy governor of Ashtian and Garkan. He commissioned the construction of two architecturally significant castles and relocated several households from Ashtian to the village. In addition to these castles, the village hosts a historic bathhouse that belonged to Mirza Zeyn-al-Abedin Khan Rafiei (Mo'tamed-al-Ayaleh) (Hazrati Ashtiani 2020: 98-99).

Born in 1300 AH/1882 CE, Mirza Zeyn-al-Abedin Khan, son of Mohammad Rafi' Khan and titled Mo'tamed-al-Ayaleh Koochak, governed the regions of Ashtian, Farahan, Khalajestan, and Garkan for over two decades. He was recognized and commended by the government of 'Iraq-e 'Ajam' as well as by contemporary statesmen, including Sardar-e Ejlal, Sa'ed-od-Dowleh, and Sardar Bakhtiar. In 1335 AH/1916 CE, Russian forces encamped in 'Iraq-e 'Ajam', causing damage to his jurisdiction and affecting several villages, including Garkan, Zangabad, Safarabad, Naderabad, Dastjerdeh, Khorakabad, Rastegan, and Kardijan. During his administration, taxation was transitioned from in-kind to cash payments. Known for his dignity and resolute character, he demonstrated particular dedication to organizing mourning ceremonies for the Commander of the Martyrs (Imam Hussayn), opening his dining hall to the public during Muharram and Safar. He passed away in 1371 AH/1951 CE, and his funeral procession to Qom was attended by the entire community (Hazrati Ashtiani 2003: 208–209).

- **Historical monuments of Ja'farabad Village**

The landlord castle of Ja'farabad, situated 24 km south of Ashtian (34°23′08″N, 49°54′16″E), is located north of the contemporary village. The castle spans a total area of 7,984 m², of which 5,875 m² is dedicated to an open courtyard layout (Figure 4). The northern courtyard serves as

a substantial garden, featuring a vaulted Shahneshin hall, flanked by two two-story towers at its northern perimeter. The southern section consists of two subsidiary courtyards intended for service functions and livestock management. A series of small, interconnected rooms is arranged along the northern and eastern sides of the main courtyard, as well as along the eastern and western sides of the second courtyard. The third courtyard accommodates stables and auxiliary service spaces. The main entrance is positioned on the southern façade. Architectural ornamentation is predominantly expressed through brickwork and stucco detailing (Figure 5).

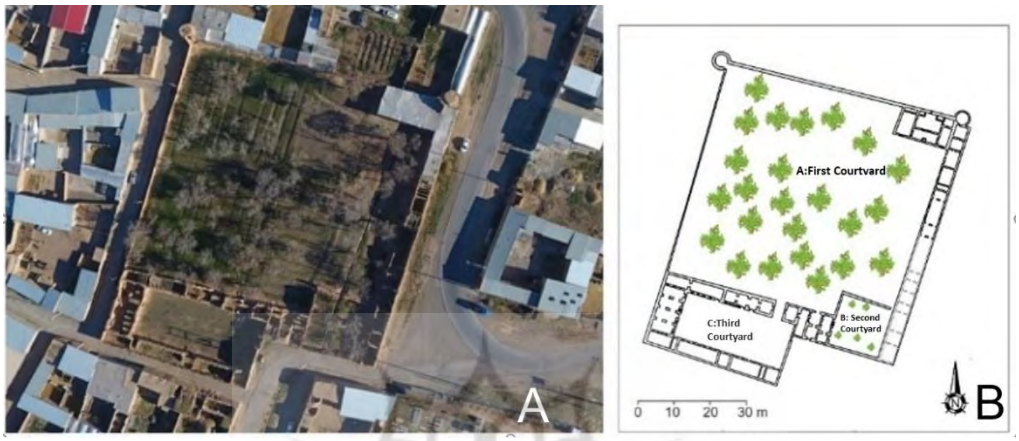

Figure 4. A. Aerial photo by quadcopter from the landlord garden-castle of Ja'farabad (Photo by authors 2021), B. Plan of the landlord garden-castle of Ja'farabad (Photo by authors 2021).

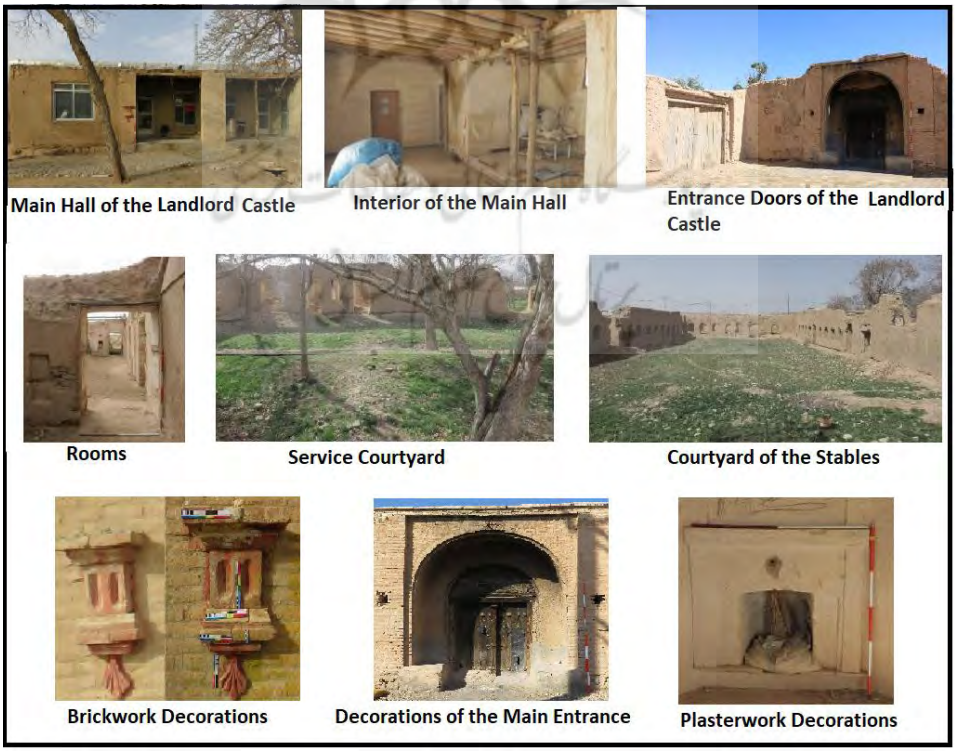

Figure 5. Structures of the landlord garden-castle of Ja'farabad (Photo by authors 2021).

The expansive northern courtyard was primarily reserved for the landlord (*Arbab*) and his immediate family. Historically, a prominent pool was positioned in front of the main hall (Shahneshin); however, it was irreversibly destroyed following the 1979 Revolution in Iran due to unregulated interventions. Documentary and archival sources, including the film "*Wheat Grains*" (directed by: Rafiee, 1980: timestamp: 00:15:03), which was filmed at this landlord castle, confirm the historical existence of this pool (Figure 6). This courtyard represents a quintessential example of the Iranian garden typology, characterized by a deliberate interplay of artificial and natural elements. Furthermore, the presence of fortified walls and northern watchtowers demonstrates the hybrid nature of the garden-castle complex, reflecting both defensive and aesthetic considerations within historical landscape design.

Figure 6. A frame from the *Wheat Grains* film that shows the pool in the northern garden of the landlord's Castle (Director: Hasan Rafiee 1980), timestamp: 00:15:03.

The peasant Castle of Ja'farabad is located to the south of the modern village of Ja'farabad, near the landlord Castle, at coordinates 34°23′00″ N and 49°54′13″ E. The total area of the castle encompasses 5,170 m², of which 1,783 m² consists of open spaces organized into six courtyards. The castle has two main entrances, located on the northern and southern facades. Above the northern gate lies the principal hall (*Shahneshin*), flanked by two *Iwans* on its northern and southern sides. A central axial street divides the castle into eastern and western sections. Along both sides of this axis, courtyards are arranged, each containing a set of residential rooms (Figure 7).

The plan and structure of these rooms follow a standardized typology: each household comprises a central kitchen (*Matbakh*) flanked by two interconnected rooms on either side. Architectural ornamentation includes brickwork and plaster decoration, as well as inscriptions of Qur'anic verses and poetic verses adorning the ceiling of the *Shahneshin*.

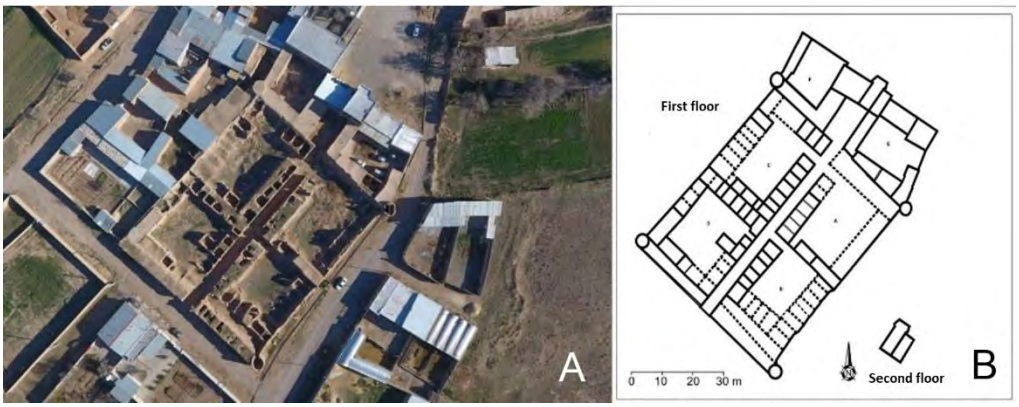

Figure 7. A. Aerial photo by quadcopter from the peasant castle of Ja'farabad (Photo by authors), B. Plan of the Peasant Castle of Ja'farabad (Photo by authors 2021).

Among the notable historical monuments in this context, aside from the aforementioned castles, is the village's historic bathhouse (*Hammam*), located between the two castles and in close proximity to the mosque and Qanat water source. The structure dates back to the Qajar period. An examination of the Ja'farabad bathhouse indicates that its siting was deliberately selected according to functional and environmental considerations, including proximity to the mosque, accessibility to water, and recessed position below ground level to enhance thermal stability and moisture insulation of the architectural structure. Additionally, situating the bathhouse at a lower elevation facilitated the gravitational flow of water into the building and improved its internal circulation through subterranean channels (*Tanbushes*). Architecturally, the bathhouse consists of three primary spaces: the entrance hall (*Sarbineh*), the intermediate corridor (*Miyandar*), and the hot chamber (*Garmkhaneh*) (Figure 8). The *Sarbineh* includes a central pool and elevated seating platforms, while the *Miyandar* serves as a transitional corridor connecting the *Sarbineh* to the *Garmkhaneh*. The hot chamber contains the water reservoir (*Khazineh*) and designated washing areas. During the Pahlavi era, part of the *Garmkhaneh* was modified to accommodate private shower units (Figure 9).

Figure 8. Historical bathhouse of Ja'farabad village, A. *Miandar*, B. *Shahneshin*, C. *Sarbineh* (Photos by authors 2024).

Figure 9. Showers and Pahlavi-era changes in the historical bath of Ja'farabad village (Photo by authors 2024).

Theoretical Framework: The Iranian Garden and Garden-Castles

The Iranian garden represents a distinctive cultural, historical, and architectural phenomenon on the Iranian plateau. Typically designed as an enclosed space where vegetation, water, and built structures are integrated within a defined architectural system, creating a secure, comfortable, and aesthetically pleasing environment for humans. According to the *Encyclopaedia Islamica*, a garden is defined as "an often-enclosed area constructed by humans, incorporating flowers, plants, trees, water, and specific built features, based on geometric principles and cultural beliefs" (Nowrouzzadeh Chegini 2020). The Iranian garden embodies a synthesis of beauty, utility, daily functional needs, and abstract conceptual meanings. In other words, it represents a spatial composition in which artificial and natural elements - such as water and vegetation - are combined architecturally to manifest a poetic and imaginative experience. This phenomenon can be interpreted in terms of both material and symbolic dimensions, as well as both interactions, encompassing a broad spectrum of concepts, functions, techniques, and artisanal craftsmanship.

In 1982, the Florence Charter for Historic Gardens defined a garden as "an architectural combination of inanimate and plant elements; thus, it is a living manifestation of the culture of each people and the conditions of its homeland." Although this definition does not fully encompass the heritage value of historic gardens, it emphasizes the architectural integration of animate and inanimate elements, highlighting the importance of re-examining and interpreting garden architecture. This approach demonstrates that, across diverse cultures and climates, gardens are realized through locally adapted expressions of this integration. Fundamentally, the structure of all historic gardens worldwide relies on the architectural organization of natural and built elements—specifically, the combination of vegetation, water, and structures—to create a suitable environment for human habitation. What distinguishes a garden as a cultural and natural heritage site, however, are its conceptual layers, symbolic meanings, and site-specific physical and functional characteristics. Accordingly, the Iranian garden exhibits distinct attributes shaped by local culture, climate, and historical context (Shahcheraghi 2019: 41).

As previously noted, the enclosing wall constitutes a fundamental component of the spatial structure of extensive Iranian gardens. During certain historical periods and within specific urban contexts, walls were often constructed thicker and taller primarily for protective purposes: to safeguard the garden from animal intrusion, to ensure the security of the garden's inhabitants against potential attacks, and to provide psychological comfort through a private and secluded environment for personal life. In some cases, these walls evolved into elevated castle-like structures, complete with bastions and watchtowers integrated into the enclosure. Notable examples include the *Bagh-e Behesht* of the Hasan Sabbah castles in Alamut, the *Fin* Garden of Kashan, and several gardens in Shiraz during the Safavid period. Furthermore, within certain public gardens of Safavid Isfahan, smaller walled gardens were constructed internally, functioning as fortified garden-units or garden-castles. Overall, security and defensive considerations represent the predominant characteristic of the garden-castle typology (Shahcheraghi 2019: 50).

Discussion and Analysis

Field surveys and site visits to the Ja'farabad garden-castle, alongside a review of documentary sources related to the site, provided data that require specialized analytical methods for a deeper understanding and interpretation of the relationships among them. To this end, the analysis of data obtained from field surveys and documentary sources was conducted using three complementary methods. First, content analysis of documentary sources was employed to examine narratives, themes, and both explicit and implicit information within these sources. Second, spatial analysis was applied to investigate the structural patterns, spatial organization, and geographical context of the site and its surrounding landscape. Third, comparative analysis was undertaken to evaluate key elements in site conservation—including intervention, action, and monitoring—against the guidelines of UNESCO, ICOMOS, and the Venice Charter.

In the comparative analysis, pre-established international conservation criteria for the phases of intervention, action, and monitoring were identified and used as a theoretical framework for the preservation of the Ja'farabad garden-castle. Overall, integrating these three methods enables a comprehensive and precise representation of the research subject. This multidimensional approach ensures that the research outcomes extend beyond a simple summary, providing a foundation for scientific inferences and practical recommendations.

- **Spatial Organization and Functional Analysis**

During the Qajar period, the construction of castles increased notably, particularly those commissioned by local rulers and elites, serving as residential estates known as *Arbabi* (landlord) castles (Molazadeh and Mohammadi 2006: 16). Historical records from Ja'farabad village, supplemented by oral testimonies, indicate that the Ja'farabad garden-castle functioned as a landlord estate, combining defensive purposes with residential use for the lord and his close relatives. In the contemporary era, however, following the dissolution of the feudal system and transformations of land ownership, the primary function of the garden-castle has been lost. This has led to gradual abandonment, utilization for animal housing, and extensive anthropogenic degradation. Accordingly, the Ja'farabad garden-castle can be considered an exemplar of the integration of defensive and residential architecture with vernacular and agricultural structures.

The complex was constructed using locally sourced materials such as sun-dried bricks, clay, fired bricks, and timber, in full harmony with the natural terrain.

Spatial analysis of the Ja'farabad garden-castle was conducted using a combination of quantitative measurements and qualitative observations. Key indices, including courtyard areas, ratio of open to built space, number of entrances, circulation paths, and accessibility axes, were systematically recorded from site plans, aerial photographs (years 1968 and 2009), and field surveys. GIS mapping and manual measurement techniques were applied to ensure accuracy.

Field surveys reveal that its spatial features—including a rectangular plan, northern watchtowers, continuous mudbrick walls, internal service and residential elements, as well as the natural and artificial components typical of the Iranian garden—reflect a hybrid military-residential typology. This military-residential or defensive-residential system is intrinsically linked to the broader phenomenon of the Iranian garden, illustrating the confluence of functional, cultural, and environmental considerations in vernacular Qajar-era estate architecture.

The landlord castle of Ja'farabad demonstrates a significant connection with the Iranian garden tradition in terms of geographical context, landscape systems, environmental resources, and climatic characteristics, reflecting the architectural intelligence and strategic planning of its builders. Iranian gardens are traditionally established based on the availability of water, fertile soil, favorable climatic conditions, and vegetation adapted to the local environment. This integrated system of water, climate, landform, and landscape constitutes the foundational "substrate" that enables the emergence of a garden. Understanding and preserving this substrate is essential for the stability and sustainability of the garden.

Iranian gardens have developed across diverse terrains, including plains, foothills, deserts, and urban areas. In these gardens, the primary water source is typically located outside the garden enclosure, underscoring that the siting of a garden is intrinsically linked to water availability. Water is supplied through various sources, such as wells, Qanats, springs, or rivers, and the continuity and vitality of the garden depend entirely on this resource (Irani Behbahani *et al*. 2013: 148–149). Similarly, the Ja'farabad garden-castle demonstrates optimal conditions for garden creation, given its alluvial and fertile soil, the presence of Qanat water, and the passage of the Qanat through the castle grounds.

Beyond visual and aesthetic considerations, the results indicate a hierarchical spatial organization, with the landlord castle positioned at the highest vantage point, featuring the largest courtyard (1,250 m²) and the most controlled access points, reflecting both defensive and social priorities. In contrast, the peasant castle exhibits smaller courtyards (average 420 m²) and simpler circulation paths, consistent with subordinate status and functional simplicity. These spatial distinctions directly inform conservation priorities, emphasizing interventions that maintain both historical hierarchy and accessibility.

Furthermore, a comparative analysis of the open spaces of five historic residential houses in Ashtian with the open courtyards of the two historic castles of Ja'farabad, particularly the

landlord castle, reveals a higher proportion of open space in the Ja'farabad castles. The size of courtyards in historic structures exhibits a significant correlation with climatic variables, with air temperature emerging as the most influential factor. Temperature is affected not only by a location's geographic latitude but also by its elevation above sea level. Lower latitudes, closer to the equator, correspond to warmer climates, whereas at a given latitude, higher elevations result in cooler temperatures.

In practical terms, air temperature serves as a key determinant of human habitability and the energy required for heating and cooling (Ghiabaklou 2019: 41). Table 1 indicates that Ja'farabad is located at a lower latitude and elevation than Ashtian, resulting in a warmer local climate.

Table 1. Geographical latitude of Ja'farabad and percentage of open space area to the total building area (Table by authors 2025).

No.	Feature	Mirza Hassan house	Nouraee house	Mo'tamed al-Ayaleh house	Mirza Hedayat Allah house	Mostowfi al-Mamalek castle	Landlord castle of Ja'farabad	Peasant castle of Ja'farabad
1	Latitude	34.52	34.52	34.52	34.52	34.52	34.38	34.38
2	Elevation above sea level	2083	2086	2092	2085	2090	1788	1783
3	Percentage of open space area to the total building area	24.06%	28.84%	24.72%	27.94%	32.69%	73.58%	34.48%
4	Number of yards	2	3	1	4	10	3	6

Analysis of Table 1 indicates that the highest proportion of open space is observed in the landlord castle of Ja'farabad, which includes its garden, followed by the peasant castle of Ja'farabad. The extensive open areas in these castles may be attributed to the Ja'farabad warmer climate compared to Ashtian. Moreover, when considering both the proportion of open space and the number of courtyards in other historic monuments, it becomes evident that all structures in Ashtian feature relatively small courtyards, consistent with the region's colder climate. In contrast, the garden within the landlord castle of Ja'farabad was intentionally designed to respond to the warmer climate, helping to moderate thermal conditions within the residential spaces. For instance, the interior of the Mostowfi al-Mamalek castle (Aqa castle) in Ashtian lacks an integrated garden; its renowned Nazar garden is situated separately, while the internal courtyards are relatively small, reflecting the cooler climatic conditions of the region (Figure 10).

Figure 10. A. Aerial photo of Ja'farabad (After: National cartography organization 1947), B. Plan of Aqa castle, including its surrounding demolished spaces (Photo by authors 2021).

- **Cultural and Identity Landscape Analysis**

The landlord–peasant production relationship, as an economic system, has long governed the socio-economic interactions in Iran. In evaluating social and economic systems, including the feudal system, a fundamental issue lies in the social existence (ontology) of the labor force; thus, understanding the characteristics of the labor is essential to grasp the nature of production relations (Soudagar 1957: 5). Within this system, two major social classes—the landlords (*Arbab*) and peasants (*Ra'yat*)—possess opposing economic interests. The landlord owns the land and water, the primary means of production, yet generally does not participate in cultivation, instead claiming a portion of the produce according to the *Muzare'a* (sharecropping) system. Peasants can be broadly categorized into two groups: landless tenants (*Khoshneshin*) and landholders with limited means (Nasaq-dar). The latter, possessing basic production tools, cultivate land temporarily assigned by the landlord, providing a share of the produce, rent in kind, cash, or labor as compensation (Soudagar 1957: 15). The formation of Ja'farabad village as a settlement for agricultural and horticultural communities is closely linked to the utilization of peasant labor in the cultivation of fields and gardens. The presence of gardens, agricultural lands, and the Qanat as a water source corroborates this socio-economic framework. However, not all gardens were purely functional for agricultural production. The Ja'farabad garden-castle exemplifies a semi-military landlord building that, in addition to providing an aesthetically pleasing and pleasurable space, incorporates elements for the protection of the landlord and his close kin while simultaneously supporting productive activity.

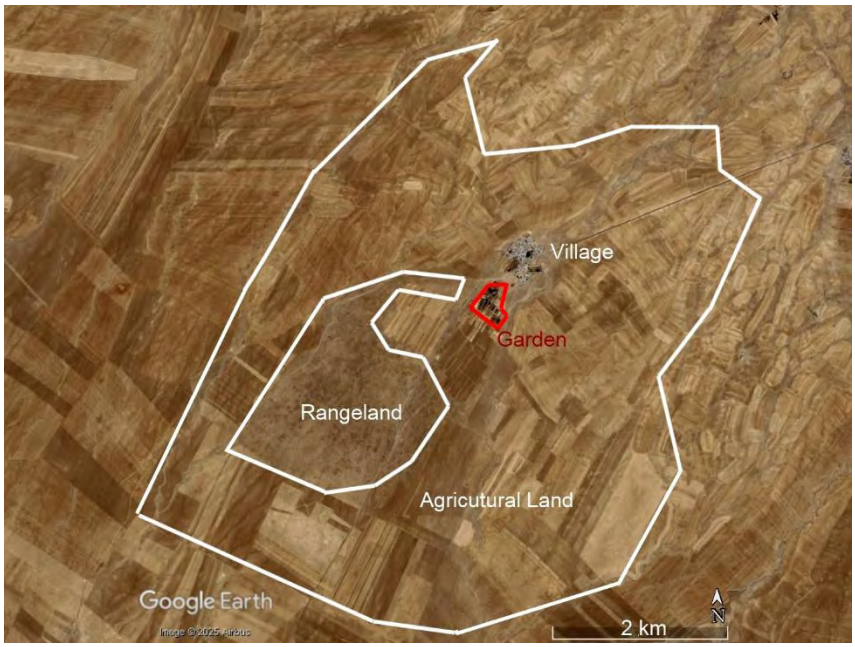

Figure 11. Location of Ja'farabad village, Ashtian, and its surrounding lands (After: Google Earth 07/02/2024 and modified by the Authors).

Considering the conflicting economic interests of the landlord and peasants, the need for a semi-military residential environment for the landlord was essential. In the landlord castle of Ja'farabad, this necessity is evident in the architectural district: watchtowers and continuous enclosure walls reflect the protective and cautious approach of the landlord. Consequently, the garden-castle is not merely a physical structure but a significant component of the village's historical and cultural landscape. Its relationship with the surrounding village pattern, communication axes, Qanat, gardens, pastures, and agricultural lands (Figure 11) demonstrates a dynamic interaction between humans and nature within the framework of the traditional rural economy. The destruction of this building would result in the loss of a substantial portion of Ja'farabad's collective memory and historical identity. Therefore, its conservation represents not only the preservation of a historic structure but also the safeguarding of an entire cultural ecosystem.

- **Conservation Strategies for the Ja'farabad Garden-Castle**

Conservation strategies for the Ja'farabad garden-castle are proposed based on the spatial and structural analyses conducted in previous sections. Each recommendation is directly linked to field data, aerial imagery, and quantified spatial indices, ensuring evidence-based interventions.

- **Identification of Damages and Challenges**

Before any conservation interventions in historic monuments and urban districts, it is essential to conduct comprehensive studies, including documentation, architectural surveys, condition assessment, and structural analysis in accordance with cultural heritage guidelines (Feilden 2003: 45–60). In the sections "Historical monuments of Ja'farabad village" and "Spatial organization and functional analysis", detailed documentation and surveys of the castle have been conducted. However, field investigations and aerial photos reveal that the building has suffered various physical damages due to abandonment and inappropriate use as an animal

shelter. These damages include partial collapse and deterioration of walls and spaces, material erosion and lack of maintenance, growth of invasive vegetation, human damages - such as the destruction of the castle pool, burning of doors, addition of new doors, application of waterproofing membranes, and modifications of spaces. Further degradation is evident in the progressive deterioration of roofs and windows. The absence of effective supervision, local unawareness, lack of an official conservation program, and the absence of national registration have collectively accelerated the building's deterioration (Table 2) (Figure 12).

Table 2. SWOT analytical model for studying the garden-castle of Ja'farabad village with a conservation approach (Table by authors 2025).

Weaknesses	**Strengths**	**Opportunities**	**Threats**
Abandonment of castles and destruction of the landlord's castle	Presence of lords' and peasants' castles within the village	Restoration and revitalization of the landlord's castle	Destruction of castles
Deterioration and collapse of materials	Surviving sections of the *Shahneshin*	Restoration and revitalization of the garden-castle	Loss of the historical monument pattern within the historic district
Use of inappropriate materials, such as roof insulation	Using locally sourced materials	Adaptive reuse of the castle	Loss of the original core and structural integrity of the complex
Burning the main door of the castle and adding a new metal door	The overall plan of the castle remains intact	Assessment of village needs and adaptive use of the castle to address them	Widespread use of unconventional and detrimental materials
Destruction of the pond	Presence of knowledgeable people regarding the castle within the village	Registration of the building in the National Monuments List	Loss of tourism potential in the complex
Using the building to keep animals	Existence of the northern towers	Tourist attraction	Lack of awareness of the village's history and traditions among the younger people
Insufficient maintenance and repair of the building	The presence of Qanat in the castle	Using castles to empower the historic district	Lack of awareness of visitors to the garden-castle's existence
Non-registration on the National Monuments List	Presence of trees in the garden	Revival of traditional architectural models in new constructions	Urbanization of the villagers

Migration of castle owners		Maintaining the visual structure of the historic district	Loss of traditions
Lack of proper use		Upgrading the village through the restoration of castles and gardens	

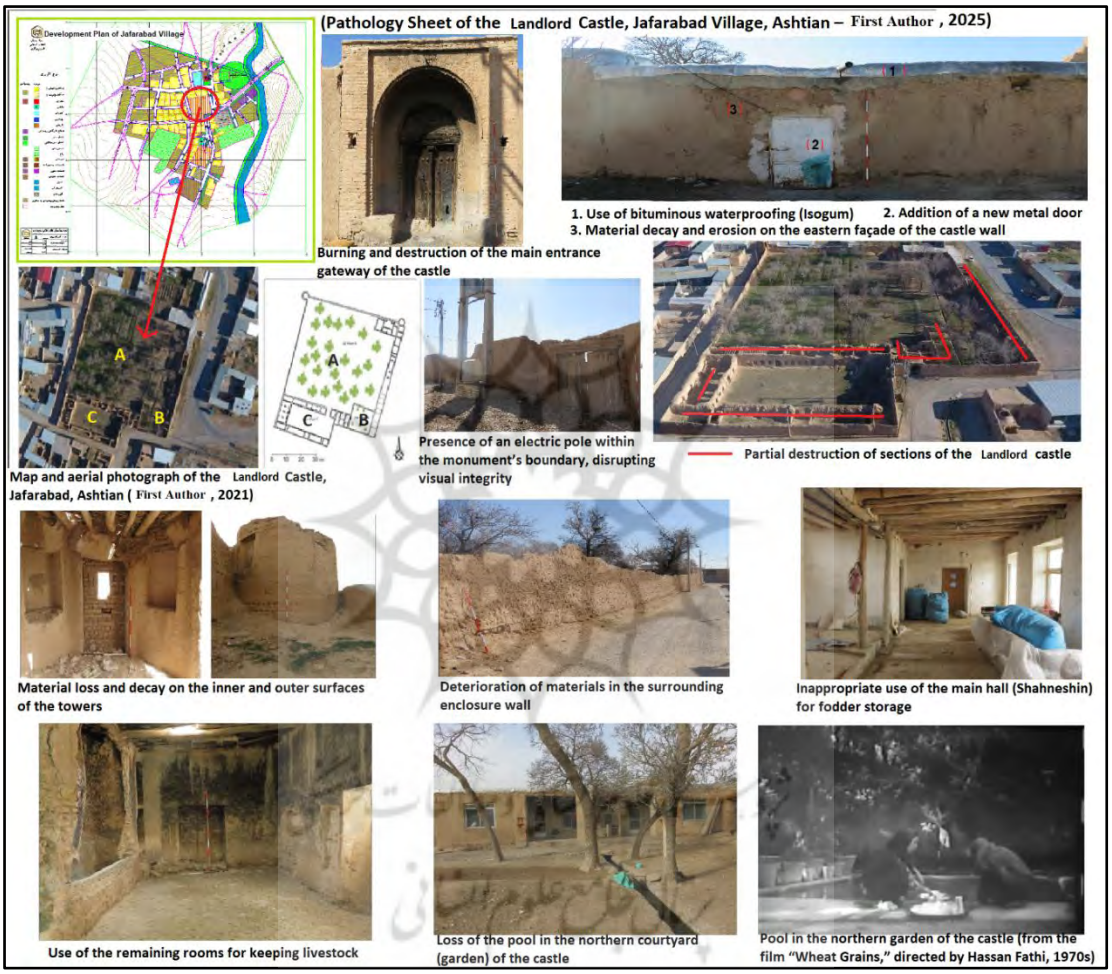

Figure 12. Condition survey sheet of Ja'farabad historical garden-castle (Photo by authors 2025).

- **Intervention and Implementation**

Considering the absence of residential or accommodation facilities in the central county of Ashtian and Ja'farabad village, the strategic location of the Ja'farabad garden-castle within the village, its historical function for residential purposes, and the harmonious integration of natural and artificial elements within the structure, the restoration and conservation of this heritage site hold significant importance. The architectural and structural capacity of the historic vernacular building - featuring original architectural elements such as towers, central courtyards, and arches - combined with its enclosed, security-oriented plan of the castle, and the presence of a serene garden space, further emphasize its cultural and spatial value.

Moreover, the castle's historical, cultural, and identity-related background, as reflected in local narratives, rituals, and public memories, plays a key role in reinforcing a sense of identity and belonging among village residents. This sense of belonging enhances community participation in the conservation process. Collectively, these factors underscore the necessity of comprehensive and strategic intervention to safeguard the Ja'farabad garden-castle. Accordingly, its conservation process should adopt a phased, multidisciplinary approach grounded in architectural conservation principles and sustainable development. To this end, three primary axes are considered as the framework for project implementation: 1) physical or structural interventions, 2) participatory management, and 3) adaptive and meaningful reuse and utilization.

A) Physical Interventions or Structural Conservation

In comparable cases, the reinforcement of structurally vulnerable sections using vernacular materials and reversible techniques—while emphasizing the preservation of the structural authenticity—is generally recommended (Feilden 2003: 120–135; ICOMOS, 1994, paras. 3–7). Accordingly, in the case of Ja'farabad garden-castle, the structural conservation and reinforcement of vulnerable elements - such as towers, walls, and damaged roofs – should be carried out employing locally sourced and reversible materials and methods.

In the case of the landlord castle of Ja'farabad, field surveys identified structural deterioration and partial collapse in the northern wall, which also defines key sightlines and defensive hierarchies. Restoration should prioritize this wall to preserve both its structural integrity and historic spatial organization.

Furthermore, the restoration and rehabilitation of original and prominent architectural features—including the main entrance gate, watchtowers, central courtyard, and principal residential spaces—should be undertaken while maintaining the authenticity of materials, colors, and forms. In addition, the upgrading of essential infrastructure and the provision of fundamental utilities (such as water, electricity, sewage, ventilation, and safety systems) should follow the principles of minimal intervention, ensuring that all new installations are discreetly integrated within non-visible or secondary areas of the complex.

Regarding circulation routes, the analysis of movement axes indicates that the central passage connecting the landlord and peasant castles is critical for historical circulation and access. Efforts should be made to conserve the original path alignment, even when some adjacent structures have deteriorated. In addition, the number and placement of entrances (4 in the landlord, 2 in the peasant castle) define accessibility and security hierarchy. Any interventions should preserve original gate positions and structural forms.

Conservation plans for the mosque and public bathhouse should also maintain usability without compromising historical materials, guided by their spatial roles and connection to the main castles.

B) Formation of a Local Restoration Task Force

Based on UNESCO guidelines, the establishment of a participatory organization using a community-based management model within historic urban districts is recommended (UNESCO 2011, Sec. C, paras. 4–8). In line with these principles, it is proposed to establish a management body in Ja'farabad village comprising representatives from the Cultural Heritage Organization, the village council (*Dehyari*), legal or private owners, and trusted local figures. This body would be responsible for supervising and guiding the processes of conservation, monitoring, and restoration.

Local capacity-building and training are essential to strengthen the community's involvement in heritage preservation. These initiatives may include workshops on traditional restoration techniques, community-based tourism, hospitality, and handicrafts, thereby fostering villagers' active participation in safeguarding their historical and cultural heritage.

Additionally, attracting investment from both private and public sectors through well-structured project proposals and securing financial support from heritage restoration funds, cultural tourism investors, or rural development foundations is paramount for ensuring the long-term sustainability of conservation efforts.

C) Adaptive Cultural and Residential Use

Redefining the complex as a community-based ecotourism lodging with cultural and interpretive spaces aligns with sustainable revitalization approaches and strategies (Jokilehto 1999: 300–315).

Adaptive and sustainable utilization can be achieved by establishing a "cultural eco-residential complex", comprising traditional lodging, local restaurants, handicraft workshops, exhibition areas, and cultural-tourism events such as seasonal festivals, local storytelling nights, and cultural-tourism gatherings, implemented across both Ja'farabad castles. Heritage interpretation services, including guided tours, interpretive signage, audio guides, and thematic cultural tours, can enhance visitor awareness and enrich the overall tourism experience.

Sustainable management, participatory governance models, and revenue-generation strategies should ensure that a portion of the income is allocated for the restoration, maintenance, and preservation of the complex, as well as to local training programs and socio-cultural development initiatives. Such measures are crucial for conservation and safeguarding Ja'farabad's cultural and historical heritage while simultaneously promoting the local economy.

- **Monitoring**

Following conservation interventions, the Ja'farabad garden-castle should be monitored continuously and long-term, in line with established standards and guidelines for historic gardens as valuable heritage assets. The International Council on Monuments and Sites (ICOMOS) and the International Federation of Landscape Architects (IFLA) adopted the "Florence Charter" during their meeting in Florence on 21 May 1981, aimed at the protection of historic gardens. The draft charter, prepared by the committee, was formally appended to the Venice Charter by ICOMOS on 15 December 1982, specifically addressing issues related to

historic gardens (Anonymous 2006: 46). A careful review of the charter reveals that it emphasizes not only the physical conservation of historic gardens but also the preservation and continuity of their functional use - whether residential, tourism, or cultural - as well as the coordinated monitoring of vegetation and natural elements alongside artificial components. Key provisions of the Florence Charter relevant to the monitoring and conservation of historic gardens, such as the Ja'farabad garden-castle, include the requirement that all elements of a historic garden be treated simultaneously during maintenance, conservation, restoration, or reconstruction; separating operations can compromise the overall integrity of the garden (Article 10).

No restoration or reconstruction project should proceed without comprehensive scientific research and preliminary studies, encompassing archaeological excavations and documentation of the garden and comparable sites. A project plan derived from this research must be reviewed and approved by a panel of experts before implementation (Article 15).

Due to its nature and purpose, a historic garden provides a tranquil environment conducive to human contemplation and interaction with nature. Daily use should not conflict with rare ceremonial events, and temporary events must be clearly defined to ensure that celebrations enhance, rather than damage, the garden's visual and experiential value (Article 19). Maintenance and conservation schedules should prioritize the garden's authenticity over functional use, taking into account seasonal considerations and adhering to principles of minimal intervention. Furthermore, Visitor access protocols must be established to preserve the spirit of the garden (Article 21). Responsible authorities are required to implement legal and administrative measures for identification, inventory, and protection of historic gardens, integrating such measures into land-use and regional planning documents (Article 23). Adequate training should be provided for historians, architects, landscape architects, gardeners, and botanists to ensure the long-term preservation and informed management of these heritage assets (Article 24) (Anonymous 2006: 46–52).

The historic Ja'farabad garden-castle, in accordance with Articles 1 and 2 of the Florence Charter, possesses a living and reconstructible character and, as a "heritage monument," requires meticulous supervision and continuous conservation. Articles 10 and 21 of the Charter further stipulate that all elements—both structural and vegetative—must be monitored and maintained simultaneously, and that daily use should not take precedence over ongoing preservation activities.

Article 15 emphasizes the necessity of restoration work grounded in scientific research and preliminary studies. Therefore, historical, archaeological, architectural, ethnographic, and geographical investigations are essential for designing and implementing effective conservation programs for the Ja'farabad garden-castle. Article 19 advocates for the preservation of the garden's natural tranquility and serenity, recommending that its use be conducted with minimal intervention and under controlled supervision. Moreover, Articles 23 and 24 highlight the importance of professional management and the training of local specialists to ensure the site's long-term sustainability.

Accordingly, continuous monitoring of the Ja'farabad garden-castle should include: simultaneous structural and environmental surveillance (Article 10), principled restoration based on comprehensive research (Article 15), maintenance of the garden's tranquility (Article 19), controlled daily use and visitor management (Article 21), and engagement of trained local professionals (Articles 23 and 24). This standardized monitoring framework, guided by the Florence Charter, provides a scientific, documented, and actionable methodology to ensure the authenticity, structural integrity, and ecological health of the Ja'farabad garden-castle.

Conclusion

The Ja'farabad garden-castle in Ashtian represents a complex, multi-dimensional heritage asset, integrating historical, architectural, cultural landscape, and social layers. As a rural aristocratic castle, it combines defensive and residential architecture with the principles of the Persian garden. The geographical setting, landscape framework, environmental resources, and climatic conditions provided an optimal context for the spatial organization of the garden-castles' functional components.

The development of the village was closely intertwined with peasant settlement and an agricultural-horticultural economy; however, not all gardens served productive purposes. The Ja'farabad garden-castle, for example, offered both recreational and protective functions for the lord and his entourage, highlighting its dual role as both a residential and cultural landscape element. Consequently, the garden-castle transcends its physicality, constituting a core component of Ja'farabad's historical-cultural landscape. The potential loss of the complex would entail not only the destruction of a built structure but also a rupture of the community's historical identity.

Active conservation and adaptive reuse strategies can establish a model for the preservation of other overlooked garden-castles across Iran. Recommended measures include comprehensive diagnostic and structural assessments, followed by staged and integrated interventions rooted in conservation principles and sustainable development. These interventions should focus on three key axes: 1) physical preservation, including structural stabilization using local and reversible materials, restoration of original architectural elements while maintaining their materiality, color, and form, and careful upgrading of basic infrastructure (water, electricity, sewage, ventilation, and safety systems) with minimal visual impact; 2) participatory management through a dedicated working group comprising heritage authorities, local governance, landowners, and trusted community representatives to guide conservation, monitoring, and stakeholder engagement; and 3) adaptive reuse strategies that redefine cultural-residential functions, supporting both heritage preservation and local economic revitalization. Long-term monitoring should adhere to continuous standards, simultaneously addressing both structural and vegetative components. Professional management and the training of local specialized personnel are essential to ensure the resilience and sustainability of the garden-castles for future generations.

Generally, this study presented the first systematic spatial and functional analysis of the Ja'farabad garden-castle. By linking architectural and landscape features to social patterns and

proposing evidence-based conservation strategies, the research fills a notable gap in the study of Persian rural heritage and offers a replicable methodological framework for similar sites.

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Statement of Conflicting Interests

The Author(s) state(s) that there is no conflict of interest.

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