

An Archaeological Study of the Isma'ili Fortresses of Dāmḡān with Emphasis on Geographic Variables

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Abstract

This study examines the relationship between geographic variables and the location, architecture, and long-term occupation of the Isma'ili fortresses of Dāmḡān County in northeastern Iran. During the Islamic period, Dāmḡān formed an important sector of the Isma'ili defensive network in the historical region of Qūmis, containing several major fortresses and outposts, including Gerdkūh, Mehrnegār, Mansūr-kūh, Qal'a-ye Doktar, Stīvhād, and Shīr. The primary objective of this research is to evaluate the extent to which environmental and geographic factors influenced the selection of fortress locations and the persistence of occupation at these sites. The study employs a descriptive-analytical methodology that combines archaeological field survey, historical and textual evidence, satellite imagery, and Geographic Information Systems (GIS) analysis. A range of environmental variables—including elevation, topography, slope, hydrology, climate, geology, mineral resources, vegetation, and communication routes—were examined and compared with the spatial distribution of the Isma'ili fortifications. The results demonstrate that the distribution of the fortresses followed a deliberate and non-random pattern closely associated with strategic environmental conditions. Most sites were established on elevated terrain overlooking the Čašma-ye 'Alī River corridor, major communication routes connected to the Great Khorasan Road (Silk Road), agriculturally productive plains, and mineral-resource zones. The fortresses also maintained visual interconnectivity and benefited from favorable defensive topography, reliable water supplies, and access to economic resources. Architectural evidence further indicates that these sites were adapted to local environmental conditions through the construction of cisterns, defensive walls, towers, and multi-level architectural complexes. The study concludes that geographic variables played a decisive role in the location, architectural organization, and long-term viability of the Isma'ili fortresses of Dāmḡān. These fortifications constituted an integrated territorial network designed to support the military, economic, administrative, and religious objectives of the Nezārī Isma'ili state in northern Iran.

Keywords: Dāmḡān, Nezārī Isma'ilism, Isma'ili Fortresses, Gerdkūh, GIS, Cultural Landscape, Geographic Variables.



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Introduction

The relationship between human societies and their surrounding environment has long been recognized as a fundamental factor shaping settlement organization, architectural forms, and the development of political landscapes. Geographic variables—including topography, elevation, climate, geology, water availability, mineral resources, and communication networks—not only influence patterns of human occupation but also affect the sustainability and long-term continuity of settlements. In fortified landscapes, these environmental conditions become particularly significant, as decisions regarding site selection and architectural organization are closely connected to issues of defense, economic control, access to resources, and territorial administration. The Isma‘ili fortresses of Iran provide an important case through which to investigate the interaction between environmental conditions and political organization. During the fifth to seventh centuries AH, the Nezārī Isma‘ili state established an extensive network of fortifications across different regions of Iran. These fortifications functioned not merely as military structures but also as administrative, economic, and religious centers. The selection and development of these fortified landscapes reflected deliberate strategies that enabled long-term occupation under changing political and environmental circumstances.

Among these regions, Dāmḡān County occupies a particularly significant position. Located within the historical region of Qūmis and situated along major east–west and north–south communication corridors, Dāmḡān served as an important crossroads linking central Iran with Khorasan and neighboring regions. Its strategic position along the Great Khorasan Road (Silk Road), together with access to agricultural lands, water resources, and mineral zones, made the region an important center of Isma‘ili activity (Saber & Khosheghbal, 2023). In particular, Gerdkūh Fortress constituted one of the principal Isma‘ili strongholds and played a major role in the political and economic dynamics of the region due to its strategic position along the Khorasan Road. Other Isma‘ili fortresses and outposts in Dāmḡān similarly occupied locations that suggest careful consideration of environmental and strategic conditions. Although the history and political development of the Isma‘ilis have received considerable scholarly attention, the relationship between the Isma‘ili fortresses of Dāmḡān and their surrounding landscape has not yet been systematically investigated. Consequently, the broader spatial logic governing the organization of the Isma‘ili defensive landscape in Dāmḡān remains insufficiently understood.

To address this gap, the present study adopts a landscape archaeology approach and combines archaeological field survey, historical and textual evidence, satellite imagery, and Geographic Information Systems (GIS) analysis to investigate the Isma‘ili fortresses of Dāmḡān. Particular attention is given to the role of geographic variables—including elevation, climate, geology and mineral resources, hydrology, and regional and transregional communication routes—in shaping fortress location, architectural organization, and patterns of long-term occupation.

Research Questions: This study seeks to answer two principal questions: 1) How did geographic variables influence the selection of locations for the Isma‘ili fortresses of Dāmḡān? and 2) To what extent did environmental and geographic conditions contribute to the continuity of settlement and the long-term functionality of these fortifications?

It is hypothesized that the distribution of the Isma‘ili fortresses of Dāmḡān followed a deliberate and non-random spatial pattern shaped by environmental opportunities and strategic considerations. By examining the interaction between geography and architecture, this study aims to provide a more comprehensive understanding of the cultural landscape of Dāmḡān during the period of Nezārī Isma‘ili presence and to contribute to broader discussions concerning fortified landscapes and settlement systems in medieval Iran.

Historical and Archaeological Background of Dāmḡān and Previous Research

Numerous studies have examined the historical, cultural, social, and political structures of the Isma‘ilis in Iran. Given the focus of the present article, however, only those works that directly concern the region under investigation are considered here. Because several of the Isma‘ili fortresses in the study area were also occupied during earlier periods, a brief overview of human presence in the region across different historical eras is first provided before turning to the Isma‘ili period itself.

Archaeological evidence indicates that the history of settlement in Dāmḡān County dates back to the Paleolithic period. A field survey conducted in the Chah Jam region, located approximately 6 km south of the city of Dāmḡān, recovered a total of 525 Paleolithic lithic artifacts (Vahdati Nasab & Hashemi, 2018: 10–14). The recovered evidence suggests that human occupation in this region can be attributed to the Middle and Upper Paleolithic periods (Alibeigi & Khosravi, 2009; Berillon et al., 2007; Biglari & Shidrang, 2006; Biglari et al., 2009; Chevrier et al., 2010; Heydari Guran et al., 2014; Rezvani & Vahdati Nasab, 2010; Vahdati Nasab et al., 2010).

At present, however, no evidence of Neolithic occupation has been reported from Dāmḡān itself (Sharifi, 1997; Dyson & Thornton, 2009; Roustaiei, 2016: 35). Nevertheless, Neolithic settlements have been identified in the neighboring plains of Shāhroud and Bastām, both located adjacent to Dāmḡān (Roustaiei, 2016). During an archaeological survey conducted in 2006 by Kourosh Roustaiei, 270 ancient mines—including copper, lead, iron, gold, and turquoise deposits—were identified. The resulting data indicate that these mines were exploited across various historical periods, from prehistory through the Islamic era, by the inhabitants of the Shāhroud and Dāmḡān regions (Roustaiei, 2012). Due to its strategic geographical position, Dāmḡān consistently attracted the attention of successive political powers throughout history. One of the most significant events associated with the Achaemenid period in this region is the death of Darius III, the last Achaemenid king, and Alexander’s temporary residence in the city of Hecatompylos. According to historical and archaeological hypotheses, both of these events took place

within the territory of ancient Qūmis (Jafarpour et al., 1989: 13). According to most scholars, the archaeological site of Qūmis, near the modern village of Qūsheh, can likely be identified with ancient Hecatompylos. Covering an area of approximately 3×7 km (Stronach et al., 2019: 185), it represents the largest contemporary settlement in the region, and its importance during the Arsacid period is well established. Excavations were carried out there over four seasons—in 1967, 1971, 1976, and 1978—under the joint direction of John Hansman and David Stronach (Hansman, 1968; Hansman & Stronach, 1970a, 1970b, 1974; Stronach et al., 2019). Overall, archaeological surveys documenting Parthian–Sasanian settlements across the Dāmḡān plain (Sharifi, 1997; Trinkaus, 1981), along with two excavation seasons at the Kesht Dasht site (Sharifi, 2019), indicate that these settlements were distributed linearly along water sources and the Khorasan Road communication network.

During the Sasanian period, Qūmis was of considerable importance. It is mentioned in the Middle Persian text Šahreštānīhā ī Ērānšahr as follows: “The city of Kūmīs of five towers Aži Dahāg made it his own harem. The abode of the Parthians was there. In the reign of Yazdgird, the son of Šabuhr made it during the invasion of the Čōl, at the boundary of the Gruzian Guard” (Daryaei, 2002: 18). The most significant archaeological evidence from the Sasanian period in Dāmḡān is associated with the site of Tepe Hissar (Dyson & Howard, 1989; Trinkaus, 1981, 1985). During his visit to the site, Mas‘ūdī identified the structure as a fire temple. The monument was later examined by archaeologists such as Vanden Berghe, Herzfeld, and Ritter (Vanden Berghe, 1968; Herzfeld, 1994; Ritter, 2019). Herzfeld (1994) interpreted the building as an early Sasanian palace (p. 309), whereas Schmidt, based on comparisons between its stucco decoration and other Sasanian examples, assigned it to the late Sasanian period (Schmidt, 2012). In contrast, Bussagli and Scerrato, drawing on comparisons with Hatra, proposed a Parthian date for the monument (Bussagli & Scerrato, 2004: 50). More recent studies, however, indicate that the structure was in fact a fire temple dating to the late Sasanian period (Hozhabri & Mortazavi, 2022: 125). Compared with other regions of the Alborz Mountains or Khorasan, the Isma‘ili fortresses of Dāmḡān have received relatively limited scholarly attention. More than any other researcher, Manouchehr Sotoudeh focused on the fortresses of Qūmis, discussing these strongholds extensively in *The Ismailia Fortresses in the Alborz Mountains* as well as in several of his other works. His studies remain highly valuable within the broader field of Isma‘ili studies (Sotoudeh, 1961, 1983; Sotoudeh et al., 1988). Farhad Daftary, who has conducted extensive research on the history of the Isma‘ilis, has also referred to the Isma‘ili fortresses of Qūmis in his scholarly works (Daftary, 1997, 2001). Among his focused studies on this subject is the entry on Gerdkūh in the *Encyclopaedia Iranica*, authored by him (Daftary, 2001).

Peter Willey devoted a chapter of his book *Eagle’s Nest: Ismaili Castles in Iran and Syria* to the Isma‘ili fortresses of Qūmis. However, he only visited the Mehrnegār

outpost and merely reported the existence of several other fortresses in the Āhvānū Valley; due to time limitations, he was unable to examine them in detail or complete his investigations in Qūmis (Willey, 2005: 205–229). In both *Geschichte der Architektur Irans* and his article on Isma‘ili fortresses, Wolfram Kleiss briefly examined Isma‘ili strongholds (Kleiss, 2017). In his critique of Kleiss’s article, Mohammad Yusef Kiani also made brief references to the Shīr outpost (Kiani, 2000). In *Defensive Fortifications in Islamic Iran* and in his article “Gerdkuh or Gonbadan Dezh,” Naser Pazouki focuses exclusively on Gerdkūh Fortress and examines aspects of its architectural structure (Pazouki, 1988, 1997). In his article “Ismailis in Qūmis,” Azim Hamzeian refers to Isma‘ili control over the fortresses of Gerdkūh and Mansūr-kūh but remains uncertain regarding their control of Mehrnegār Fortress (Hamzeian, 2000: 75–91). In a detailed study of the ancient fortresses of Dām-gān, Mohammad Rezaei sought to establish connections between these structures and Iranian mythology. In this context, he presented numerous photographs of the fortresses in the Āhvānū region, north of Dām-gān (Rezaei, 2005: 425–484).

In *Fortresses and Military Fortifications*, Mollazadeh and Mohammadi briefly discuss the well known Mehrnegār Fortress and provide a concise description of the site (Mollazadeh & Mohammadi, 2006: 133–134). Drawing on historical sources, Hassan Shadpour, in his article “Qoomes and the Isma‘iliyyah,” refers to the Isma‘ili conquest of the fortresses of Gerdkūh, Mansūr-kūh, and Mehrnegār, although his primary focus is on Gerdkūh Fortress (Shadpour, 2006: 119–138). Archaeological excavations at the Isma‘ili strongholds in Qūmis have been extremely limited. In this regard, only the test trenches and rescue operations carried out at the foot of Mehrnegār Mountain by Ali Akbar Moradan can be mentioned (Moradan, 2009).

Kourosh Roustaiei also conducted a limited survey in southern Dām-gān, during which evidence for 270 ancient mines was identified along the southern mountain slopes of the Dām-gān plain (Roustaiei, 2012). Based on surface evidence, some of these mines can be dated to the Islamic period. In his book *The Fortresses and Peaks of Dām-gān*, Mostafa Saeidi introduced several of the county’s fortresses and sought to make them better known to the general public (Saeidi, 2013). Seyyed Mohammad Seyyed Yazdi and his colleagues, in an article entitled “The Role of Qūmis in the Nezari Isma‘ili State of Iran,” also examined the Isma‘ili fortresses of this region. Their study focused primarily on the better known strongholds, and they remained unaware of several other sites. Nevertheless, they correctly observed that the number of Isma‘ili fortresses in Qūmis is far greater than previously recognized (Seyyed Yazdi et al., 2017: 169–184). In his article “Qale Dokhtar of Bidestan: Isma‘ili’s Newly Discovered Castle in Qūmis,” Mohammad Saber introduces an Isma‘ili fortress in southern Dām-gān. Owing to its geographical position and the communication routes it controlled, this fortress appears to have held considerable strategic importance for the Isma‘ili state (Saber, 2021).

In 2022, with the aim of conducting a comprehensive investigation of the mountain fortresses in Dāmghān County, a three member interdisciplinary team—comprising Mohammad Saber (historian), Ruhollah Khalil Nezhadi (architect), and Homayoun Khosheghbal—was formed. Through several phases of survey and research, a total of nine mountain fortresses were identified and documented, some of which were introduced for the first time into the archaeological literature of Iran. In addition, eight fortresses, covering a total area of approximately 104 hectares, were mapped and systematically recorded (Saber, 2023). The final processed results will be presented in forthcoming publications and made available to researchers. What distinguishes the present article from previous studies is its focus on the geographical setting of Isma‘ili fortresses and their role as understood through landscape archaeology, both within the territorial domain of the Isma‘ili state and within the broader context of their presence in Dāmghān. The authors seek to examine the influence of environmental and geographical factors on the formation of the Isma‘ili fortresses of Dāmghān and to clarify the position of these fortresses within the historical context of the period under study.

The Presence of the Isma‘ilis in Dāmghān

In 471 AH, after returning from Egypt, Ḥasan Ṣabbāḥ began to propagate the Isma‘ili da‘wa in Iran (Lewis, 2016: 271). He achieved notable success in the cities of Isfahan, Yazd, Kerman, and Ray, after which he expanded his missionary activities further (Mashkour, 1976: 224). In 485 AH, he dispatched Ḥusayn Qā‘enī to the regions of Qūmis (Fig. 1) and Quhestān to supervise missionary efforts and administer the Isma‘ili fortifications in eastern Iran (Hamadānī, 1976: 103).

During this period, Rāīs Mo‘ayyad al-Dīn Mo‘azzar Moštawfī, an official of the Saljuq ruler Malekšāh, converted to Isma‘ilism at the invitation of ‘Abd al Malek b. ‘Aṭṭās after assuming the governorship of Dāmghān following the death of the Saljuq sultan. He subsequently succeeded Amīrdād Ḥabašī b. Altūntāq as commander of the fortress of Gerdkūh. However, in 489 AH Barkīāroq granted the fortress of Gerdkūh to Amīrdād (Hodgson, 1987: 179). With the rise of Sanjar to power and the support of Moḥammad Tapar, a fierce conflict broke out at the fortress of Gerdkūh, during which Amīrdād was killed. Rāīs Mo‘azzar then assumed control of the fortress and openly declared his conversion to Isma‘ilism, subsequently surrendering it to the Nezaris (Hamadānī, 1976). This explicit alliance brought considerable attention to the da‘wa of Ḥasan Ṣabbāḥ in the region and attracted numerous new followers (Shadpour, 2006: 130). As a result, the Isma‘ilis in Dāmghān were able to dominate the trade routes and, as Saljuq authority in the region declined, to collect tribute from peasants, merchants, and travelers (Jovaynī, 1976: 213). In 537 AH, the Bāvandid ruler Roštām b. ‘Alā’ al Dawla, known as Shāh Ghāzī, succeeded in besieging the principal Isma‘ili fortresses in Dāmghān (Āmolī, 1969: 131). This confrontation between the Bātenīs and the Bavandid dynasty generated prolonged unrest and instability in Dāmghān and its surrounding areas, confining the

Ismaʿilis to their fortresses and preventing them from entering the city. These conditions persisted until the rise of Moḥammad Khwarazmshah, who defeated the Bavandids and took control of Dāmghān.

The ascendancy of the Khwarazmshahids, however, proved short lived. Between 616 and 618 AH, the Mongols under the command of Subutai clashed with the Khwarazmshahs, and the Ismaʿilis exploited this situation by fomenting disorder and seizing Dāmghān along with its surrounding territories (Hodgson, 1987: 457). With the expansion of Ismaʿili power and the intensification of Mongol campaigns in the region, one of the sons of Moḥammad Khwarazmshah, Rokn al Dīn, sought refuge in the fortress of Gerdkūh (Moṣṭawfi, 1983: 459).

During the reign of Solṭān Jalāl al Dīn Menkobernī, stability in the region was maintained until 625 AH through the annual payment of a tribute of thirty thousand dinars from the fortress of Gerdkūh to Jalāl al Dīn. In that same year, however, acting on orders from Alamut, the fortress of Gerdkūh ceased paying tribute and seized control of Dāmghān (Nasawī, 1965: 164). The Mongols, who regarded both the Ismaʿilis and the Abbasid Caliphate as obstacles to their expansion, resolved during the reign of Möngke Qāʾān to eliminate them (Eqbal, n.d.: 484). Consequently, the fortress of Gerdkūh was besieged in 651 AH and, after nearly twenty years of resistance, finally surrendered to the Mongols in 670 AH (Hamadānī, 1976: 766). This fortress therefore stands as a notable example of a seemingly impregnable stronghold that resisted the Mongols for many years (Jamal, 2003: 57).

Ismaʿili Fortresses of Dāmghān

Among the Ismaʿili fortresses examined in the present study, Qalʿa-ye Doḡtar, located near the village of Bīdeṣṭān, lies within the administrative boundaries of present-day Shāhroud County (Fig. 2). Nevertheless, because this study focuses on the historical landscape of Dāmghān during the period of Ismaʿili presence, and because of the fortress's significant spatial position and its relationship to the Ismaʿili fortresses of present-day Dāmghān County—which will be discussed in the relevant section—it has been examined alongside the Ismaʿili fortresses of Dāmghān and is treated as an integral component of the cultural landscape of the study area. Surface sherds recorded and studied during repeated visits to these sites indicate that some of the Ismaʿili fortresses discussed in this study have occupational histories extending into the pre-Islamic period. Most of these fortresses appear to have been permanently abandoned during the Middle Islamic centuries following the collapse of the Ismaʿili state in the region (Table 1). Their geographical setting and architectural evidence help clarify their functions. In the following sections, each fortress is discussed and analyzed individually.

Gerdkūh

The fortress of Gerdkūh (Fig. 3) is located approximately 18 km west of Dāmghān,

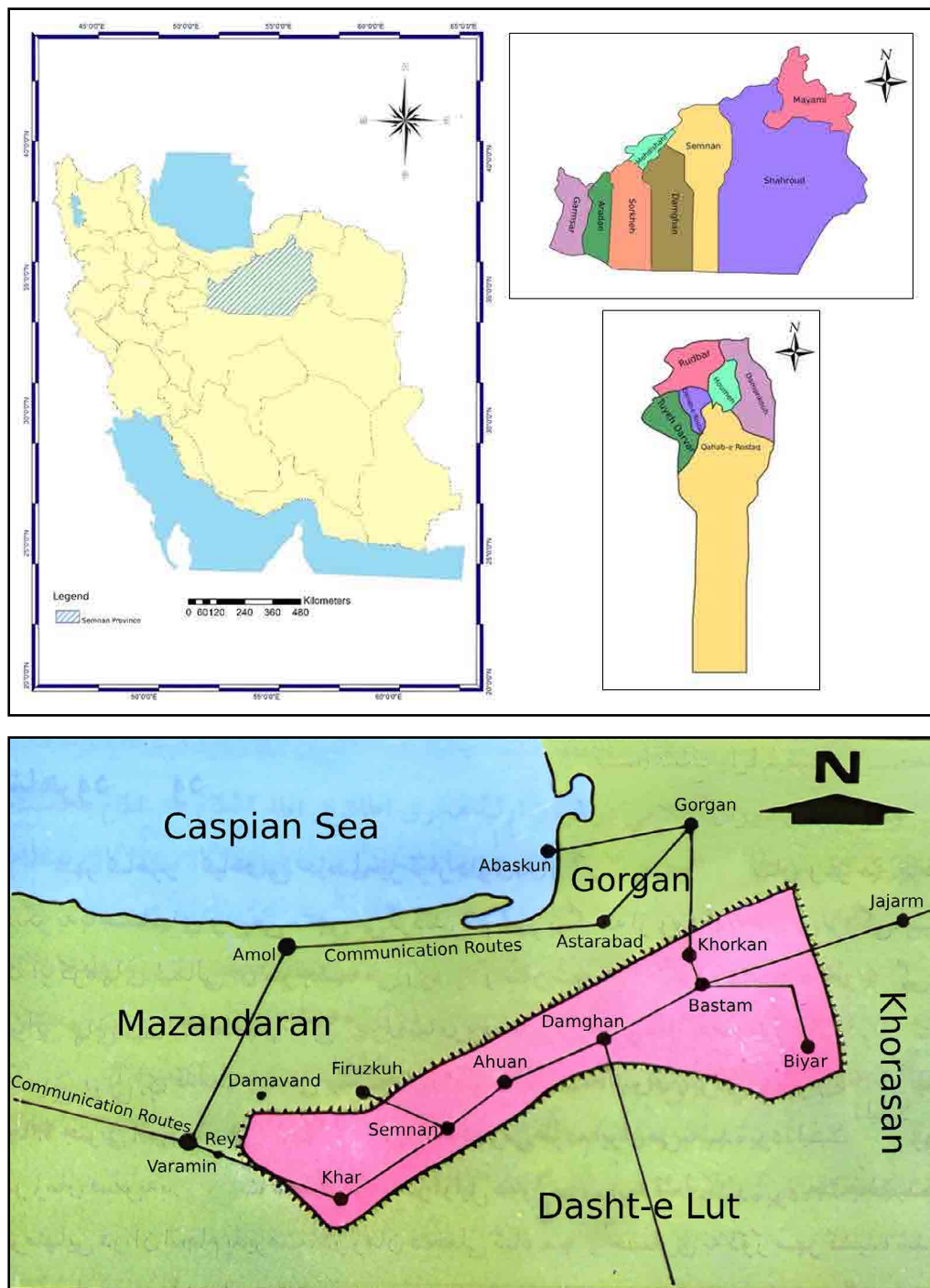


Fig. 1: Top- Location of Dāmḡān County in Iran (Authors, 2024); Bottom- Qūmis during the Islamic Period (Bani Asadi, 1995).

Tab. 1: Known Isma'ili fortresses of the study area (Authors, 2024).

Site	Function	Chronology
Gerdkūh Fortress	Military-Residential	Arsacid, Sassanid, Early, Middle and Late Islamic
Mehrnegār Fortress	Military-Residential	Arsacid, Sassanid, Early and Middle Islamic
Mehrnegār Outpost	Military	Arsacid, Sassanid, Early and Middle Islamic
Qal'a-ye Doktar	Military	Early and Middle Islamic
Mansūrkūh Fortress	Military-Residential	Arsacid, Sassanid, Early and Middle Islamic
Sūvhād Watchtower	Watchtower	Middle Islamic
Shīr Outpost	Military-Watchtower	Early and Middle Islamic

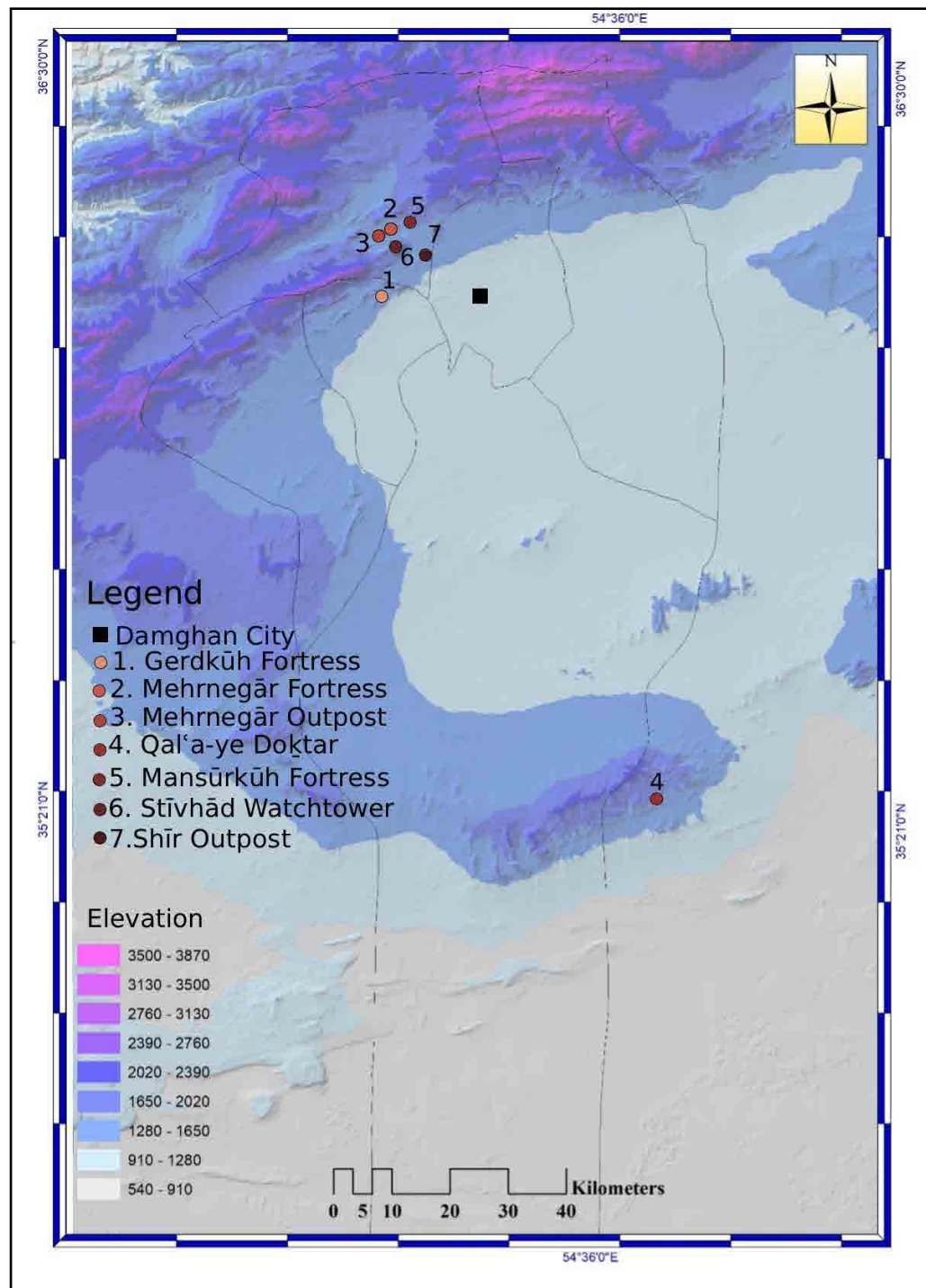


Fig. 2: Elevation and distribution of the discussed Isma'ili fortresses (Authors, 2024).

near the village of Hājīrābād i Raḡavī, at an elevation of 1,594 m above sea level (Fig. 2), and covers an area of approximately thirteen hectares. The fortress commands an unobstructed view of the Khorasan Road. The surviving remains include multiple courses of citadel walls in various parts of the site, several cisterns, the southern wall of a dovecote in the eastern sector of the fortress, towers and other defensive structures, two wells, as well as dams and water channels. Most of the architectural remains of Gerdkūh, however, remain buried beneath the surface. In addition, traces of the moat,

stone walls, and small outposts constructed by the Mongols around the mountain to ensure a complete siege of the fortress are still visible. In total, fourteen cisterns were constructed within the fortress. The larger cisterns were built along the mountain slope in a stepped arrangement; that is, they were constructed successively at different elevations, descending from higher to lower levels in a terraced configuration. To ensure more effective water management, the inhabitants also constructed two dams in the western and northwestern sectors of the fortress. These structures functioned both as reservoirs and as defensive barriers, preventing attackers from accessing these parts of the stronghold (Fig. 3). The remains of a deep well commissioned by Rāīs Moẓaffar can also be identified. According to historical sources, this well was constructed at a cost exceeding thirteen thousand gold dinars (Hāfez e Abrū, 1985). In the central and eastern sectors of the fortress, the architectural remains are densely concentrated. Based on the surviving evidence and textual references from the Islamic period, these structures may be identified as the residential and public quarters of the fortress, including a mosque, a madrasa, and military barracks. One of the most remarkable engineering features of the site is its sanitation system. In the western and central sectors, it is possible to reconstruct the fortress's sewage network and its associated terracotta pipelines. Kiani has argued that the origins of Gerdkūh may date back to prehistoric times (Kiani, 2000: 184). Daftary (2001) notes that both the date and the circumstances of the construction of Gerdkūh—possibly a pre Islamic site—remain uncertain, and that the earliest known reference to the fortress dates to the early 4th century in connection with the early Isma'ili movement in the Jebāl. Based on visits to the site by the authors and the archaeological survey conducted in 2022 mentioned above, and considering the architectural remains and surface sherds, it may be suggested that the origins of the fortress likely date to the Arsacid period, with further evidence of occupation attested from the early Islamic centuries.

Gerdkūh remained inhabited between the fifth and seventh centuries AH during the period of Isma'ili presence (Table 1), and both historical accounts (Daftary, 1997) and archaeological evidence indicate that it played a central role throughout this era. The fortress is explicitly mentioned in several Islamic texts, where it is also referred to as Dež-e Gonbadān (Mostawfī, 1983: 201; Hamadānī, 1959: 117; Ferdowsī, 1884). In 613 AH, Ḥamawī visited the fortress and noted that it could easily be distinguished from the surrounding mountains (Ḥamawī, 2001: 539). During the reign of the Saljuq ruler Malekšāh, Gerdkūh was administered by an individual named Ẕordak. Following Malekšāh's death, control of the fortress passed to Amīrdād and Rāīs Moẓaffar, and from 493 AH onward it came under Isma'ili administration (Sotoudeh, 1983: 157–159). Reports in Islamic historical sources attest to the fortress's great importance for the Isma'ilis, to the extent that it may be regarded as the principal center of Isma'ili fortresses in Qūmis (Mostawfī, 1983). According to one account, the wife and children of Ḥasan Šabbāḥ resided in this fortress (Mostawfī, 1983).

Gerdkūh was the last Nezārī stronghold in Iran to surrender to the Mongols. The fortress was besieged for seventeen consecutive years, beginning in Rabīʿ I 651 AH (May 1253). The garrison of Gerdkūh finally surrendered due to a lack of clothing in Rabīʿ II 669 AH (December 1270), some thirteen years after the fall of Alamūt (Daftary, 2001). The Mongols did not demolish Gerdkūh, and some historical reports from later periods indicate continued habitation at the site (Daftary, 2001). Surface sherds from Gerdkūh also provide evidence of later occupation. It appears that Gerdkūh was completely abandoned by the early Safavid period (Daftary, 2001).



Fig. 3: Gerdkūh: Left- View of Gerdkūh from the southwest (Saber, 2023: 50); Right- Dam on the northern slope (Authors, 2024).

Mehrnegār (Fortress and Outpost)

The stronghold of Mehrnegār was constructed in two sections on two adjacent peaks that complemented one another. The Fortress of Mehrnegār occupies the summit of Jeshnegān to the east and served as the residential sector, while the Mehrnegār Outpost is located on the summit of Mehrnegār Peak to the west, immediately adjacent to the Časma-ye ʿAlī road (Fig. 2). Mehrnegār is situated 19 km northwest of the city of Dāmghān, at elevations of 1,667 m above sea level for the fortress and 1,507 m for the outpost.

In both sections of the site, construction and restoration materials commonly used by the Ismaʿilis are evident, including stone, gypsum mortar, brick, and sarooj. The eastern residential sector of Mehrnegār covers an area of approximately 1,820 m² and, based on its structural layout, has a rectangular plan oriented east–west (Fig. 4). The fortress features a central corridor running along its longitudinal axis, allowing rapid and efficient access to all parts of the complex and creating an organized spatial arrangement. The site also includes several cisterns, storage areas, and residential structures. The most notable feature of the eastern sector of Mehrnegār is the relative absence of defensive structures. This characteristic may support the interpretation that the complex primarily served residential and storage functions, while defensive responsibilities were likely assigned to the Mehrnegār Outpost to the west.

The Mehrnegār Outpost (Fig. 4) covers an area of approximately 1,000 m² and contains numerous towers and defensive walls. In the eastern section of the outpost, a tower rising to a height of four meters remains visible, while room-like structures covering approximately 60 m² can be observed in the northwestern part. The remains of

a small cistern are also located on the western slope of the fortress. In addition to this cistern, three others were constructed in the central part of the outpost adjacent to the northern defensive wall, and two more were built below the western defensive wall. The layout of the outpost suggests that its entrance was probably located on the eastern side.

Based on architectural and archaeological evidence, Mehrnegār appears to have been occupied from the Arsacid period through the Middle Islamic period (Table 1). Moreover, the architectural evidence clearly indicates that the two sections formed a single integrated complex (Saber & Khosheghbal, 2023). Thus, the eastern sector (Mehrnegār Fortress) contained cisterns and residential structures, whereas the western sector (Mehrnegār Outpost) was equipped with towers and substantial military fortifications.

Mehrnegār was probably captured and restored by the Ismaʿilis during the Middle Islamic period, following the conquest of Gerdkūh, sometime between 494 and 501 AH. The fortress derived its importance from its control over Časma-ye ʿAlī, the largest water source in the region; the fertile Āhvānū Valley; the trade route of the Khorasan Road; and its communication with other major fortresses in the region. As a result, the Ismaʿilis were frequently engaged in conflicts with regional powers in order to maintain control of the site (Ebn al Aṭīr, 1992: 17; Qazvīnī Rāzī, 1979; Sotoudeh et al., 1988: 47; Saber & Khosheghbal, 2023: 126). Historical sources from after the sixth century AH also refer to this fortress by the name Mehrīn (Ebn Esfandīār, 1987: 35–95; Qazvīnī Rāzī, 1979: 345). Islamic textual sources indicate that in 651 AH, Kītūqā, the Mongol military commander, captured Mehrnegār after a siege lasting five months, thereby bringing Ismaʿili rule at the fortress to an end (Hamadānī, 2014: 871). Archaeological investigations conducted at the base of Mount Jeshnegān, upon whose summit Mehrnegār Fortress is situated, have yielded evidence of military conflict, including arrowheads (Saber & Khosheghbal, 2023: 127). The last known historical reference to the fortress appears in the travel account of Clavijo from the Timurid period. He mentions the fortresses surrounding Časma-ye ʿAlī and describes them as ruined and no longer usable (Clavijo, 1987: 181).



Fig. 4: Mehrnegār Fortress and Outpost: Left- Aerial image of the Mehrnegār Fortress; Right- Aerial image of the Mehrnegār Outpost (Saber & Khosheghbal, 2023: 132).

Qalʿa-ye Doktar

Qalʿa-ye Doktar near Bīdeštān covers an area of approximately 3,000 m² and is situated at an elevation of 1,643 m above sea level. According to current administrative divisions, the fortress lies within the boundaries of Shāhroud County, near the present

day political border between Dāmḡān and Shāhrūd (Fig. 2), in the upland area above the villages of Satveh and Bīdestān. However, given its proximity to Dāmḡān and its location along the Dāmḡān–Jandaq road, it should be considered within the cultural landscape of Dāmḡān as part of the Isma‘ili fortification network. This fortress was first introduced by Sven Hedin under the name Qal‘a-ye Doḡtar, and later reports were provided by Rajabi, Saeidi, and Saber (Hedin, 2015; Rajabi, 2004; Saeidi, 2013; Saber, 2021). The importance of Qal‘a-ye Doḡtar for the Isma‘ilis lay in its control over the mineral resources of the surrounding mountains, including several copper mines and Kūh Zar (Gold Mountain), a gold mine located northwest of the fortress and one of the largest ancient gold mines in Iran. Evidence of copper smelting furnaces has also been recovered from the site (Stroeva, 1992: 167). Moreover, as noted above, the fortress controlled the communication route from Dāmḡān to the south. Saber argues that this fortress is probably identical with the Vanda mentioned in Islamic textual sources (Saber, 2021: 5–6; Eṣṭaḡrī, 1968; Ebn Ḥawqal, 1938; Maqdesī, 1982). The remains of the fortress include five towers, substantial defensive walls, several cisterns, and internal architectural structures extending from the northwest to the southeast of the mountain summit (Fig. 5). Access to the fortress is possible from the south and southeast. The available evidence indicates that the fortress was constructed using brick, stone, gypsum, timber, and sarooj mortar. Although the architectural layout of the site remains discernible, extensive destruction—including the earthquake of 1952 CE—precludes a complete reconstruction of its original form. Architectural remains indicate that the southern wall of the fortress was approximately three meters wide and forty meters long and was flanked by circular towers. These towers were constructed on multiple levels using wooden frameworks in combination with stone. The internal structures of the fortress include a rectangular architectural space measuring approximately 5×4 m, as well as a central corridor extending forty meters from north to south. Additional architectural remains and rooms are arranged around this corridor, although their precise function cannot be determined on the basis of the surviving evidence. In the eastern part of the fortress, there was probably a defensive wall; however, because of extensive destruction, its original form cannot be reconstructed. As in other Isma‘ili fortresses, spaces for water and food storage were incorporated into the architecture of the site. In this regard, two storage areas can be identified in the northern half of the fortress, constructed of stone, gypsum, brick, and sarooj mortar. Architectural evidence and surface archaeological data confirm occupation during the early and Middle Islamic centuries (Table 1).

Mansūrkhūh

Mansūrkhūh Fortress covers an area of approximately 5 hectares and is located northwest of the city of Dāmḡān, adjacent to the present-day village of Mansūrkhūh, at an elevation of 1,768 m above sea level (Fig. 2). In contrast to the other Isma‘ili fortresses of Dāmḡān,

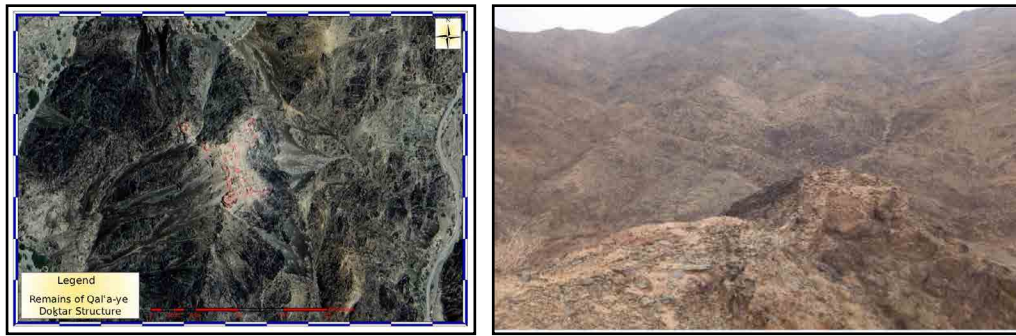


Fig. 5: Qal'a-ye Doktar: Left- Architectural structure of Qal'a-ye Doktar; Right- The communication corridor between the southern towers (Saber, 2021: 11).

Mansūrkhūh has suffered less destruction, and its architectural remains have survived in relatively good condition.

The remains of the fortress include several layers of defensive walls, four towers, and a number of other substantial structures. Evidence indicates that, like Gerdkhūh, the fortress was constructed on multiple levels (Fig. 6), and some of its buildings were multi-storied. As in other Isma'ili fortresses of the region, the primary construction materials consisted of stone, gypsum mortar, and sarooj, although brick was also employed in certain sections. All of the towers were constructed on the mountain slope and integrated into the defensive wall circuit. Narrow arrow slits have been well preserved in some of them, clearly indicating their defensive function. The tower located in the northern part of the fortress, however, differs from the others in that it was built on the mountain ridge itself (Fig. 6). Given its elevation and relative inaccessibility compared with the rest of the fortress, it is difficult to attribute a defensive purpose to this structure. This tower has a circular plan, and its walls have survived to a height of approximately seventeen meters. The interior space is divided into separate compartments by internal walls. Near the upper section of the outer wall, a series of upward-inclined openings has been incorporated. This type of aperture is unique among the Isma'ili fortresses of the region and is likely the reason why the structure has become known as the "Observatory".

A noteworthy aspect of Mansūrkhūh is that, in addition to the visible architectural remains on the surface, a substantial portion of the fortress's architectural features and communication routes remains buried. On the mountainside, the roof of one of these underground corridors has partially collapsed. This passage is approximately ten meters long and is intersected by another corridor that leads to a chamber containing a water well. This well, located beneath the mountain, was constructed above the course of a spring. The spring's outlet is situated approximately five hundred meters from the fortress and would have been easily accessible—and thus vulnerable—to enemy forces during a siege. The internal well, however, ensured a reliable and secure water supply for the inhabitants of the fortress. Unlike other Isma'ili fortresses of the region, Mansūrkhūh contains relatively few storage facilities and water cisterns, suggesting that the well served as the primary water source.

Surface sherds indicate that Mansūrkhūh Fortress was occupied from the Arsacid period through the Middle Islamic period (Table 1). The fortress was constructed near Mehrnegār, and direct references in Islamic textual sources confirm that it remained under Isma‘ili control (Ebn Esfandīār, 1987). The Bāvandīd ruler Shāh Ghāzī Rostam b. ‘Alī succeeded in capturing the fortress for a time; however, according to Islamic sources, this occupation was brief. During the Mongol invasion and the reign of the Isma‘ili ruler ‘Alā’ al-Dīn Moḥammad, the fortress remained in Isma‘ili possession before eventually falling under Mongol siege (Ebn Esfandīār, 1987: 111–112; Daftary, 1997: 426; Sotoudeh, 1983: 160–161).



Fig. 6: Mansūrkhūh Fortress: Left- View of Mansūrkhūh Fortress from the southwest; Right- The structure known as the Observatory (Authors, 2024).

Stīvhād Watch tower

The Stīvhād Watchtower is located northwest of the city of Dāmḡān, adjacent to the village of Āhvānū, at an elevation of 1,403 m above sea level (Fig. 2). Locally, the site is also referred to as Āsīābād. Its location provides exceptional command over the Čāšma-ye ‘Alī and the Āhvānū Valley. The watchtower also occupied a key position within the communication network between Gerdkūh in the west and the other Isma‘ili fortresses located east of Čāšma-ye ‘Alī, as it maintains clear lines of sight to all the fortifications surrounding the spring. This limited function—namely, its role as a communication and observation post—likely explains why, unlike the other Isma‘ili structures in the region, the site occupies only a small area. The surviving remains consist of a stone tower situated on the ridgeline, several small mudbrick chambers on the lower slope, and a wall located farther downslope at a considerable distance (Fig. 7).

The stone tower, which represents the best preserved element of Stīvhād, was constructed using materials similar to those employed in the other fortresses examined in this study. However, the wall on the western part of the mountain and the small mudbrick chambers were probably built at a different time. These structures do not correspond to the other known Isma‘ili architectural remains of the region and show no visible structural connection with the tower. For this reason, the authors argue that the term “fortress” should be avoided for this site and that, given its strategic function, it is more appropriately classified as a watchtower. The watchtower was probably constructed by the Isma‘ilis between 494 and 501 AH and, like the other fortifications

in the Časma-ye ‘Alī region mentioned by [Clavijo \(1987\)](#), was probably destroyed in the eighth century AH by order of Tīmūr ([pp. 180–181](#)).



Fig. 7: Stīvhād Watchtower: Left- Architectural structure of Stīvhād; Right- View of the Stīvhād Watchtower from the south ([Saber, 2023: 53](#)).

Shīr Outpost

The Shīr Outpost, also known as Labrūd, is located northwest of the city of Dāmḡān at the base of the Shahīd Shāhcherāghī Dam (Fig. 8), at an elevation of 1,388 m above sea level (Fig. 2). The outpost is larger than the Stīvhād Watchtower but smaller than the Mehrnegār Outpost. Based on the architectural evidence and the scale of its structures, the site was likely not capable of accommodating a large permanent garrison. Furthermore, given its commanding view over the city of Dāmḡān, it most likely functioned primarily as a communication and observation post. The surviving remains indicate that the Shīr Outpost was a small Isma‘ili military observation and communication post northwest of Dāmḡān. Although much of its architecture has been destroyed, the remaining structures suggest that the site originally included several towers, defensive walls, and small storage spaces constructed of stone, gypsum mortar, and sarooj, consistent with other Isma‘ili sites in the region. Archaeological evidence, including pottery sherds and architectural remains, indicates that the outpost was occupied during the early and Middle Islamic periods. The pottery sherds and architectural remains recovered from the Shīr Outpost further indicate that the site was occupied during the early and Middle Islamic centuries (Table 1). [Kiani \(2000\)](#) dates the Shīr Outpost to the sixth century AH ([p. 184](#)).



Fig. 8: Shīr Outpost: Left- View of the Shīr Outpost and the Shahīd Shāhcherāghī Dam; Right- Shīr Outpost, viewed from the west ([Authors, 2024](#)).

Geographic and Environmental Variables

Dāmḡān is one of the counties of Semnān Province and comprises two districts and six rural districts ([Iran Statistical Yearbook, 2021](#)). The geographic and environmental variables associated with the Isma‘ili fortresses of Dāmḡān are discussed below.

Slope, Faults, and Topographic Relations

From a topographic perspective, Dāmḡān County can be divided into three elevational zones. The northern and northwestern parts consist of highland areas aligned along the east–west axis of the Alborz Mountain Range. Moving from north to south and from west to east, the landscape gradually transitions into foothill zones and ultimately into desert regions (Mahmoudi, 1999: 100–110). Mount Sartangeh, with an elevation of 3,813 m above sea level, constitutes the highest point in the county (Iran Statistical Yearbook, 2021). The Isma‘ili fortresses of Dāmḡān County are situated within an elevational range of approximately 1,400–2,000 m above sea level. The elevations of the individual sites are as follows: 1) Gerdkūh Fortress, 1,594 m; 2) Mehrnegār Fortress, 1,667 m; 3) Mehrnegār Outpost, 1,507 m; 4) Qal‘a-ye Doktor, 1,643 m; 5) Mansūrkūh Fortress, 1,768 m; 6) Stīvhād Watchtower, 1,403 m; and 7) Shīr Outpost, 1,388 m above sea level (Figs. 2 and 9).

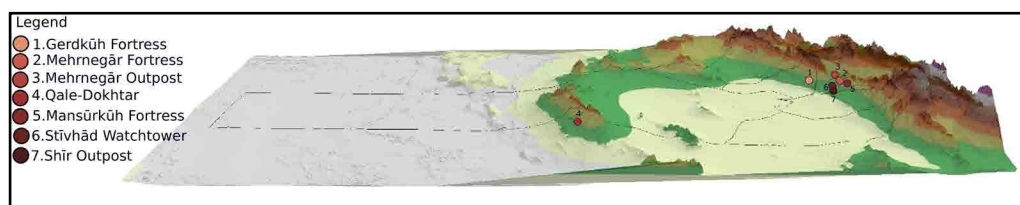


Fig. 9: Three-dimensional elevation, east–west orientation (Authors, 2024).

The slope of Dāmḡān County is strongly influenced by the region’s topography and generally decreases from north to south. In the highland areas, slopes reach up to 55 degrees, whereas in the Dāmḡān Plain and the Zardāyneh–Dāmḡān desert basin, slopes of approximately 1–5 degrees are observed (Fig. 10). Slope aspect further indicates that the fortresses are predominantly aligned along an east–west axis (Fig. 10). Dāmḡān contains numerous active and inactive faults, which generally trend north–south. However, the largest fault in the region enters from the east and is known as the Tarzeh Fault. Other active faults in the area include the Attāri Fault, the Dāmḡān Fault, and the Āstāneh Fault (Fig. 10). In 242 AH, following the activation of the Qūmis Fault, the city was destroyed. Islamic sources report that repeated earthquakes occurred in Qūmis in the same year, resulting in the deaths of more than 45,000 people beneath the rubble of collapsed houses (Ebn al Aṭīr, 1992: 247; Kāndamir, 2001: 521; Ya‘qūbī, 1977: 521; Mas‘ūdī, 2002: 48–49). The variables of topography, slope, and faults are conceptually interconnected in relation to the distribution of the Isma‘ili fortresses in Dāmḡān. Elevational and point based spatial data indicate that these fortresses exercised extensive visual control over the surrounding plains and landscapes (Figs. 2 and 9). This visual dominance enabled the monitoring of communication routes, subsistence resources, and mining activities, as well as the establishment of defensive and offensive systems by the fortress inhabitants.

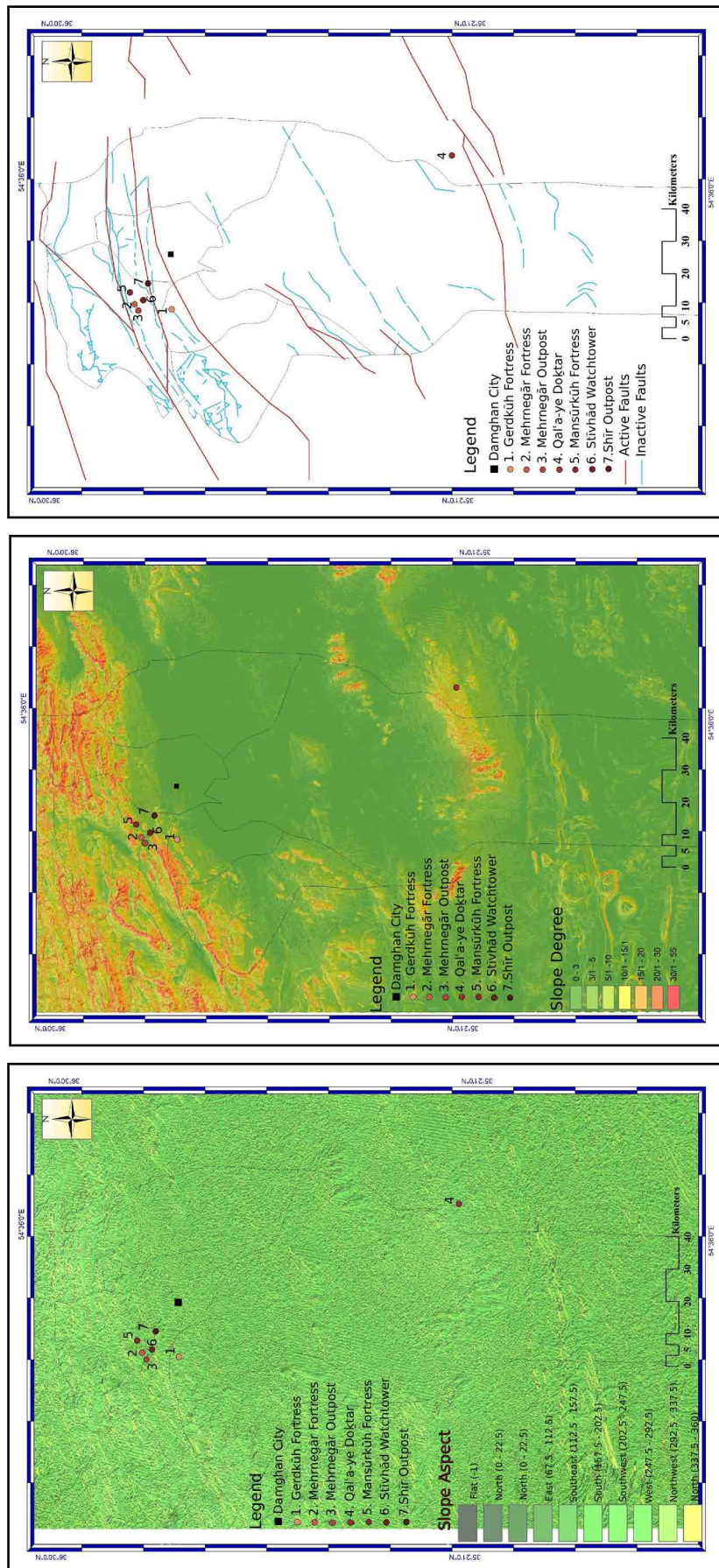


Fig. 10: Map of slope and faults of the study area: Left- Slope aspect; Center- Slope gradient; Right- faults (Authors, 2024).

Slope gradients further indicate that the Isma‘ili fortresses in the region are generally located on inclines of 20–30 degrees. Such steep slopes made access to the fortresses difficult while facilitating their defense and protection; consequently, the inhabitants likely faced lower defensive costs in safeguarding the sites against external attack. Moreover, these steep gradients facilitated the construction of water retention dams for water storage and for reducing flood damage in the downstream foothill areas. These dams may also have served defensive purposes by obstructing access routes to the fortresses. An example of such a water retention structure has been documented at Gerdkūh Fortress (Fig. 3).

Slope aspect also indicates that the fortresses were primarily constructed along an east–west axis. This geographical orientation suggests that the inhabitants optimized solar exposure, thereby maximizing the use of daylight and reducing heating requirements during the winter months.

The spatial distribution of the fortresses in relation to fault lines shows that they are located near both inactive faults and active fault zones. It appears that the fortress inhabitants attempted to reinforce defensive walls against potential seismic activity by constructing supporting buttress walls. Examples of such supporting walls have been documented at the fortresses of Gerdkūh, Mehrnegār, and Mansūrkh. However, it is also possible that these buttress walls were constructed primarily for military purposes and to strengthen the defensive structures.

Climate and Water Resources

The most important surface water resource of the county is Čašma-ye ‘Alī. This relatively large freshwater spring is located at the base of a hill approximately 24 km north of Dāmḡān (Alizadeh, 1990). Flowing southward through the Āhvānū Valley and past the Isma‘ili fortresses, it follows a gentle gradient before reaching the Shahīd Shāhcherāghī Dam (Figs. 8 and 11). Čašma-ye ‘Alī irrigates the Dāmḡān Plain watershed, which covers an area of approximately 1,300 km² (Iran Statistical Yearbook, 2021). Although the principal source of Čašma-ye ‘Alī lies in the northern and northwestern highlands of the county, seasonal waters are also present in the northern half of the county, particularly in the mountainous areas surrounding the Isma‘ili fortresses (Fig. 11). Groundwater resources in the county can be divided into three categories: wells, qanāts, and springs. Water from this and several similar springs, supplemented by numerous qanāts, supplies the domestic and irrigation needs of Dāmḡān and the surrounding villages (Alizadeh, 1990).

The geographic variables of climate and water resources show a significant relationship with the distribution of the Isma‘ili fortresses of Dāmḡān. From a climatic perspective, most of the county is characterized by arid and hyper arid conditions, particularly in the southern and central regions. Within these two climatic zones, however, only one fortress is present: Qal‘a-ye Doktar (Fig. 11), which was strategically established to

maintain proximity to the mining districts of southern Dāmḡān and to control the route connecting Dāmḡān with the southern regions. In contrast, the northern part of the county contains semi arid, Mediterranean, and humid climatic zones, and the majority of the Isma‘ili fortresses are concentrated within the semi arid zone (Fig. 11). Based on the county’s climatic map, it may therefore be argued that the Isma‘ili fortresses of Dāmḡān were well positioned to withstand climatic hazards, including severe winter frosts and summer water shortages.

Based on the county’s topographic map, both permanent and seasonal rivers can be identified. Čašma-ye ‘Alī constitutes the only permanent river in the county, whereas seasonal streams originate in the highlands and form during the winter months as a result of rainfall and flooding. The distribution of the fortresses indicates that the Isma‘ili strongholds were situated in close proximity to Čašma-ye ‘Alī. Gerdkūh Fortress lies less than 10 km from Čašma-ye ‘Alī, Mansūr-kūh Fortress less than 5 km away, and the remaining Isma‘ili fortresses within 2 km of the permanent watercourse (Fig. 11). In contrast, the inhabitants of Qal‘a-ye Doḡtar likely relied on seasonal streams, wells, and springs to secure their water supply.

Although Čašma-ye ‘Alī constituted the principal water source in the region, an irrigation network existed during the Isma‘ili period that can be reconstructed through textual sources, archaeological evidence, and geographic data. This irrigation system consisted of artificial canals, dams, and qanāt networks. It had originally been constructed by the central government, although its use required the payment of taxes (Eṣṭaḡrī, 1968: 124; Ḥodud al ‘Ālam, 1362: 385; al Maqdesī, 1982: 520; Qazvīnī, 1979: 121; Ḥamawī, 2001: 358; Moṣṭawfī, 1983: 200; Le Strange, 1958: 389).

One of the principal challenges faced by the inhabitants of the Isma‘ili fortresses was securing adequate water supplies during the warm season and during periods of warfare and siege. Consequently, water storage played a crucial role in the maintenance and survival of the fortresses. In general, the Isma‘ilis employed several methods of water procurement, including large cisterns, wells, dams, the use of seasonal springs in the mountains, proximity to rivers, water channels designed to collect rainwater, and the conveyance of water uphill from the ground to the mountaintop through terracotta pipes.

Cisterns were of great importance in the architecture of Isma‘ili strongholds, and this architectural feature is present in all major Isma‘ili fortresses. The cisterns were lined with sarooj mortar to facilitate the storage of water and other liquids while preventing leakage and loss. The construction of wells to secure water supplies within Isma‘ili fortresses is also documented in historical sources (Ḥāfeẓ-e Abrū, 1985: 209). A notable example is Gerdkūh, where, according to historical reports, a considerable budget was allocated for the construction of a well. Although springs and rivers constituted important water resources, hydrological conditions prevented the inhabitants from relying exclusively on them. Consequently, these natural resources were supplemented by cisterns and other water management facilities.

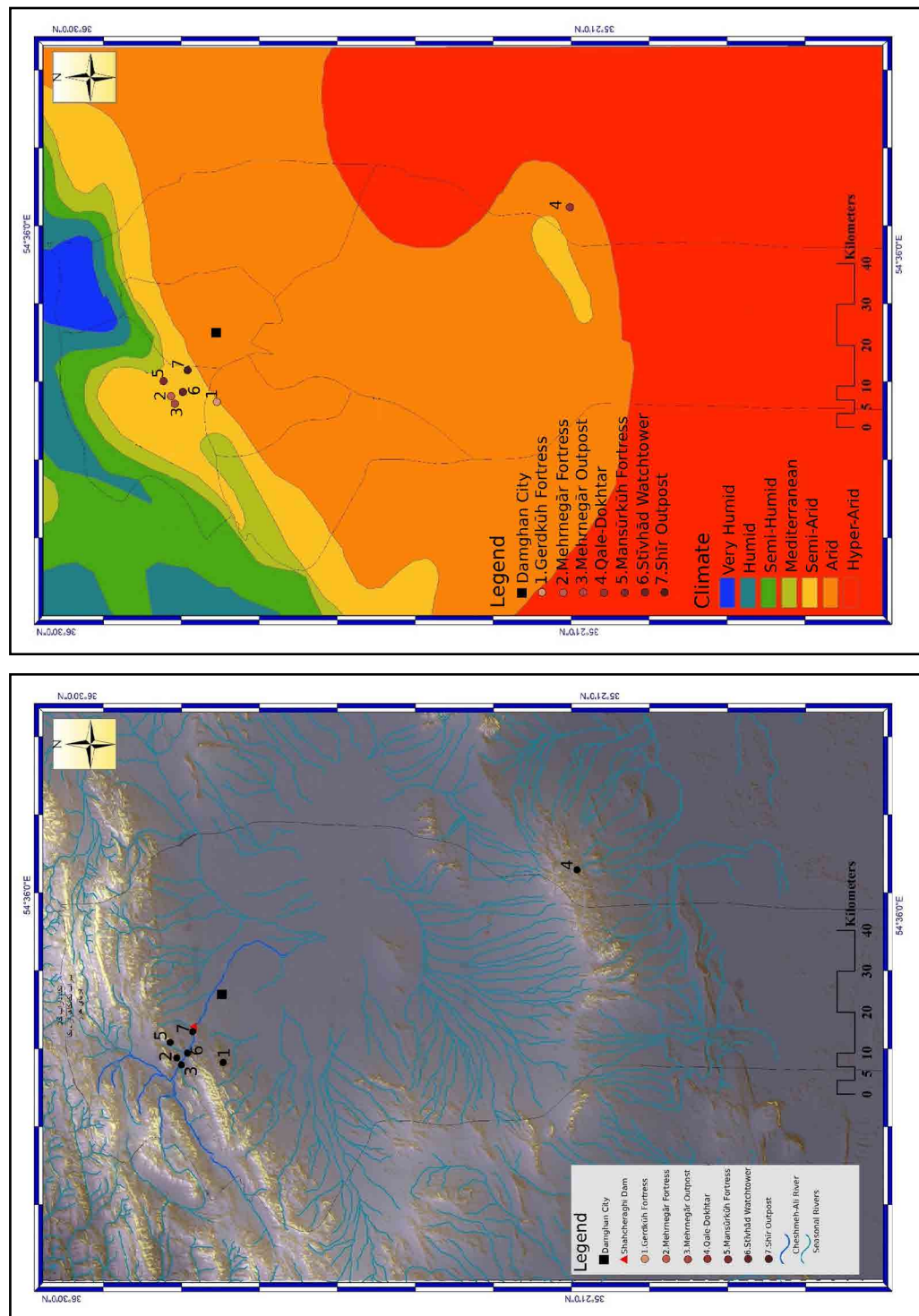


Fig. 11: Map of the climate and water resources of the study area: Top- Climate zones; Bottom- Seasonal water resources and tributaries and course of the Čašma-ye 'Alī (Authors, 2024).

Soils and Vegetation Cover

The soils of Dāmḡān County are strongly influenced by the region's elevational structure. As one moves from the highlands toward the lowlands, coarse grained soils gradually give way to fine grained soils. This shift in soil texture has a substantial impact on soil quality. Consequently, most of the county is dominated by sierozem soils, which

are poor in organic matter. Although agriculturally suitable soils occur in parts of the northern and central regions (Fig. 12), the Kavīr Chāh-e Jam area and regions farther south are characterized by saline soils and extensive salt flats (Soleimani Nejad, 2017).

The interaction of elevation, soil, and water resources has produced a distinctive vegetation cover across the county. In the mountainous areas and along the southern and southeastern slopes of the Alborz Mountains, relatively dense vegetation is present, including trees (*Juniperus* and *Pistacia*), shrubs, and scattered grasslands. In the intermediate zone between the highlands and the desert, vegetation is dominated by wormwood species (*Artemisia sieberi*), whereas the southern part of the county, owing to its unfavorable climatic conditions, is characterized by halophytic vegetation (Fig. 12).

An examination of regional soils in relation to the distribution of the fortresses reveals that the Ismaʿili fortifications were situated within desert soil zones. Although such soils were not particularly suitable for agriculture, the vegetation cover of northern Dāmḡān indicates that the Ismaʿili fortresses were located adjacent to agricultural lands and overlooked plains suitable for dry farming production. This advantage enabled the fortresses to meet their subsistence needs during periods of political and economic crisis by drawing upon the agricultural resources of the surrounding plains.

Mineral Resources

Dāmḡān's known mineral resources are concentrated primarily in the southern part of the county. An archaeological survey conducted by Kourosh Rousta'ei identified 270 mines in the region, including copper, lead, iron, gold, and turquoise deposits. The available data indicate that these mines were exploited during various historical periods—including the Bronze Age, the Iron Age, and the Islamic period—by the inhabitants of the Shāhroud and Dāmḡān regions (Rousta'ei, 2012).

Historical sources likewise refer to the county's mines and particularly emphasize the importance of the region's gold deposits, which were actively exploited (Hamawī, 2001, vol. 2: 358; Abū Dolaf, 1975: 82; Moṣṭawfī, 1983: 201; Stroeve, 1992: 167). Among the fortresses examined in this study, Qalʿa-ye Doḡtar is situated near the rich mineral resources of Dāmḡān County, and the survey of the site revealed the presence of slag on the surface. In addition to controlling the southern communication route linking Dāmḡān to Isfahān through Jandaq, this fortress appears to have played an important role in the Ismaʿilis' control over the region's mineral resources. This may explain the considerable distance between Qalʿa-ye Doḡtar and the other Ismaʿili fortresses of the region (Fig. 2).

Road Network

The most important route in the region was the Great Khorasan Road, or Silk Road, which extended for more than 13,000 km and was systematically used from the middle Arsacid period onward. Originating in eastern China, it passed through Iran and

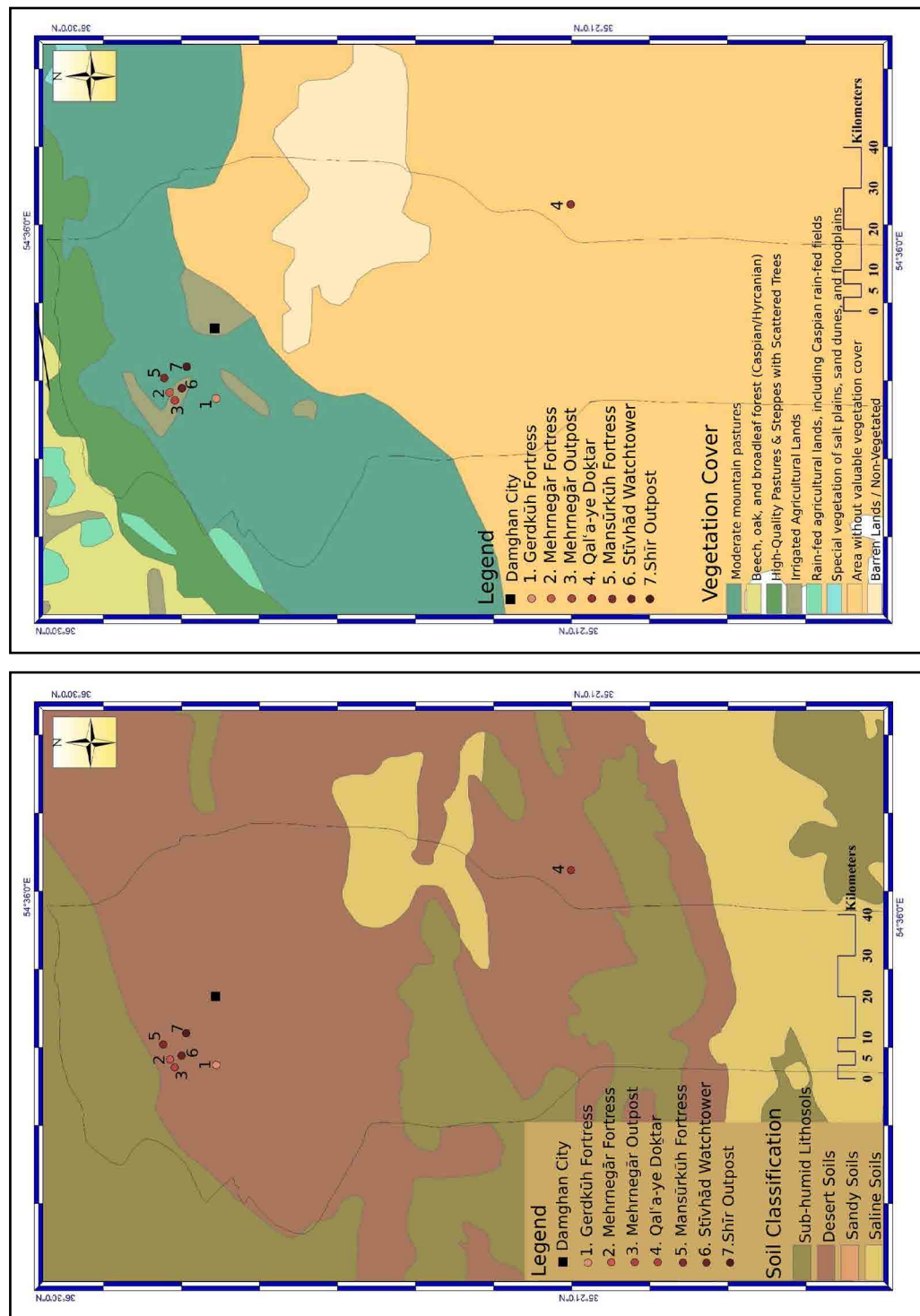


Fig. 12: Map of vegetation cover and soil types of the study area: Top- Vegetation cover; Bottom- Soil types (Authors, 2024).

ultimately connected with the Roman world (Franck & Brownstone, 1997: 12; Montazer Zohouri & Sharahi, 2020: 237; Zekrgoo, 1999; Dahpahlavan & Niknami, 2013: 231; Sharifi, 2019: 146; Hiebert & Dyson, 2002: 116). Numerous subsidiary routes branched off from this main road and were used during different historical periods (Gharchanlou & Hatami, 2012: 80).

Historical texts and archaeological evidence indicate that this route was used by both merchants and governments and that its security was maintained by regional and supra regional powers. This security was ensured through an extensive network of fortresses, defensive installations, and caravanserais designed to protect merchants and travelers, safeguard political frontiers, and sustain and stimulate local, regional, and interregional economies (Dahpahlavan & Niknami, 2013: 238; Dahpahlavan, 2006: 266; Khosheghbal et al., 2022). Al Ya'qūbī (1977), in describing the route through Dāmḡān, states that there were twelve stages along the main road between Ray and Qūmis, some of which passed through desert regions (p. 52).

With the exception of Qal'a-ye Doḡtar, the fortresses of the Dāmḡān region were constructed adjacent to the Khorasan Road (Fig. 13). The Isma'ili fortresses in the northern part of Dāmḡān County are situated in close proximity to this route. In contrast, the southern route extending toward Isfahān and beyond was probably controlled by Qal'a-ye Doḡtar. It may therefore be argued that the commanders of these fortresses were fully aware of the strategic importance of communication routes and sought to maintain control over them. Such control enabled them to use these routes both as leverage against regional and supra regional powers and as an effective means of strengthening their own economic position. The control and management of road networks and mineral resources were therefore of fundamental importance to the Isma'ilis, as they constituted the basis of their economic power.

As noted above, mining constituted one of the principal economic resources of the Isma'ilis. However, historical texts also explicitly describe the politico economic policies of the Isma'ilis regarding the use of communication routes for textile trade, the collection of tribute and taxes, and raids on commercial and pilgrimage caravans. To better understand the Isma'ili economy, which was strongly shaped by both roads and mineral resources, it should be noted that the period of Isma'ili presence in Iran coincided with severe socio economic difficulties. Disease, warfare, and famine were widespread; nevertheless, unlike many of their contemporary rivals, the Isma'ilis experienced a period of economic prosperity in the middle of the sixth century AH (Avarzamani, 2012: 99; Hamadānī, 1976: 83).

During the initial formation of Isma'ili power in Iran, the principal objective was to capture fortresses and expand a politico religious territory under the leadership of Isma'ili authorities. During this period, one of the most important functions of the fortresses was the acquisition of material resources, much of which was derived from commercial caravans (Hamadānī, 1976: 90). Furthermore, once the fortresses had been captured, their surrounding territories contributed to the material needs of the Isma'ili state, and the combined revenues from these sources enabled the consolidation of the Isma'ili economy in Iran (Daftary, 1997; Farjami, 2017: 89).

The most sustainable source of Isma'ili income derived from the principle of economic self sufficiency advocated by Ḥasan Ṣabbāḥ. Islamic sources report that the

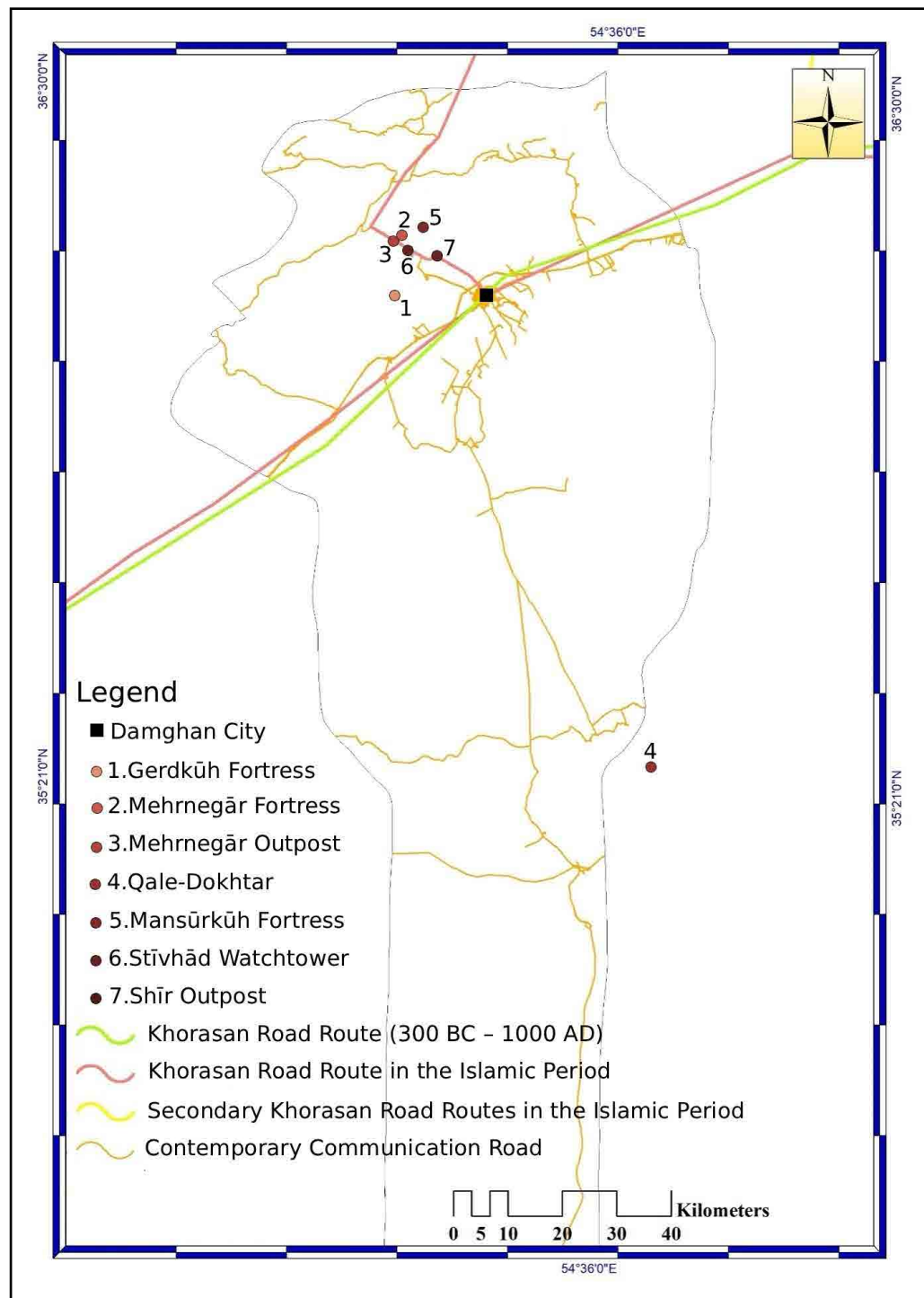


Fig. 13: Road network of the study area (Authors, 2024).

Isma‘ili imam ‘Alā’ al Dīn Moḥammad worked as a shepherd (Stroeva, 1992: 206; Kāshānī, 1987: 223). Likewise, the wife and children of Ḥasan Ṣabbāḥ were engaged in weaving at Gerdkūh Fortress in order to meet their daily needs. At the same time, trade, craftsmanship, textile production, and weaving flourished along the eastern and northern margins of the desert along the Khorasan Road (al Maqdesī, 1982: 471; Jayhānī, 1989).

War booty constituted another source of income. Owing to the strategic strength of their fortresses, the Ismaʿilis were able to acquire wealth through attacks on commercial caravans, local conflicts, irregular warfare, and surprise raids. *Ebn al Aʿfīr* (1992) reports that in 552 AH a pilgrimage caravan traveling from Khorasan to Mecca was attacked by the Ismaʿilis after passing through Baṣṭām. He further states that all the travelers were massacred and their property was plundered (pp. 16–17). *Qazvīnī Rāzī* (1979) also mentions this event but places the massacre and plunder in 553 AH, during the pilgrims' return journey from Mecca (p. 344).

The combination of an economy dependent on road networks and control over mineral resources (*Hamadānī*, 1976; *Jovanī*, 1976; *Stroeva*, 1992) enabled the Ismaʿilis to mint their own coinage (*Farjami*, 2017).

Conclusion

The spatial distribution of the Ismaʿili fortresses in Dāmḡān County was not accidental but reflects a deliberate strategy shaped by both environmental conditions and socio economic considerations. The integration of archaeological evidence, historical sources, satellite imagery, and GIS based spatial analysis demonstrates that these fortifications formed a coherent and highly organized defensive landscape. Their distribution follows a predominantly linear pattern concentrated along the Čašma-ye ʿAlī river corridor and the major communication routes of the region, particularly the Great Khorasan Road (Silk Road), while maintaining access to agricultural lands, water resources, and mineral deposits.

The geographical setting of the fortresses reveals a consistent preference for elevated locations between approximately 1,400 and 1,800 m above sea level, overlooking strategically important routes and fertile plains. Their placement near permanent and seasonal water sources within semi arid environmental zones provided favorable conditions for long term occupation while minimizing vulnerability to climatic hazards. At the same time, steep slopes, natural topographic barriers, and extensive visual command over the surrounding landscape enhanced their defensive capabilities and facilitated communication between neighboring strongholds.

Architecturally, the fortresses share several common characteristics, including the use of rubble stone, gypsum mortar, and sarooj; the construction of cisterns and storage facilities; reinforced defensive walls; and circular towers designed for surveillance and defense. These recurring features indicate the existence of a shared architectural tradition adapted to local environmental conditions. The morphology of the surrounding mountains directly influenced fortress design, producing distinctive spatial solutions such as central circulation corridors at Mehrnegār and Qalʿa-ye Doktar and multi tiered architectural complexes at Gerdkūh and Mansūr-kūh.

The evidence further demonstrates that the Dāmḡān fortress network served purposes extending well beyond military defense. Control of communication routes, access to

mining districts, supervision of agricultural production, and the management of regional resources formed the economic foundation of Ismaʿili authority in the region. The proximity of several fortresses to major transportation corridors and mineral resources, together with archaeological evidence such as metallurgical remains at Qalʿa-ye Doktar, suggests that these sites played a significant role in sustaining the economic autonomy of the Ismaʿili polity. At the same time, their strategic locations enabled the monitoring of movement across the landscape and strengthened the political and military presence of the Ismaʿili state in northern Qūmis.

The spatial organization of the fortresses also reflects the broader ideological and administrative objectives of the Ismaʿili state. Historical sources indicate that major strongholds functioned not only as military centers but also as places of religious instruction, administration, and intellectual activity. Consequently, the fortress network of Dāmḡān should be understood as an integrated system designed to support the interconnected goals of security, economic sustainability, political control, and religious propagation.

The results of this study confirm the central hypothesis that geographical variables—including topography, climate, hydrology, geology, mineral resources, and communication routes—played a decisive role in both the location and architectural development of the Ismaʿili fortresses of Dāmḡān. More broadly, this research demonstrates that the success and longevity of the Ismaʿili presence in the region depended on the effective exploitation of environmental opportunities and the strategic organization of a fortress network capable of controlling both the natural and human landscapes of northern Qūmis. The Dāmḡān fortresses should therefore be understood not as isolated defensive structures but as components of a carefully planned territorial system that underpinned the political, economic, and religious power of the Ismaʿili state in northern Iran.

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Author Contribution

This research is derived from the first author's doctoral dissertation. The primary data collection, encompassing all observational and analytical components, was conducted by the first author under the direct supervision and mentorship of the second author.

Conflict of Interest

In adherence to ethical publication standards, the authors affirm that there are no

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مطالعه‌ای باستان‌شناختی بر قلاع اسماعیلی دامغان با تأکید بر متغیرهای جغرافیایی

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چکیده

این پژوهش به بررسی رابطه میان متغیرهای جغرافیایی و مکان‌گزینی، معماری و تداوم استقرار در قلاع اسماعیلی شهرستان دامغان در شمال شرق ایران می‌پردازد. دامغان در دوران اسلامی، به عنوان بخشی مهم از شبکه دفاعی اسماعیلیان در منطقه تاریخی قومس، دربرگیرنده مجموعه‌ای از قلاع و پاسگاه‌های مهم از جمله: گردکوه، مهرنگار، منصورکوه، قلعه دختر، استیوهاد و شیر بوده است. هدف اصلی این پژوهش ارزیابی میزان تأثیر عوامل محیطی و جغرافیایی بر انتخاب محل استقرار این قلاع و تداوم سکونت در آن‌ها است. این پژوهش با بهره‌گیری از رویکرد توصیفی-تحلیلی و با تلفیق داده‌های حاصل از بررسی‌های میدانی باستان‌شناسی، منابع تاریخی و متنی، تصاویر ماهواره‌ای و تحلیل‌های مبتنی بر سامانه اطلاعات جغرافیایی (GIS) انجام شده است. در این راستا، مجموعه‌ای از متغیرهای محیطی شامل ارتفاع، توپوگرافی، شیب، منابع آب، اقلیم، زمین‌شناسی، منابع معدنی، پوشش گیاهی و مسیرهای ارتباطی مورد بررسی قرار گرفته و با الگوی پراکنش قلاع اسماعیلی مقایسه شده‌اند. نتایج پژوهش نشان می‌دهد که پراکنش این قلاع از الگوی هدفمند و غیرتصادفی پیروی می‌کرده و به طور مستقیم با شرایط راهبردی محیطی ارتباط داشته است. بیشتر این محوطه‌ها بر ارتفاعات مشرف به حوضه رودخانه چشمه علی، مسیرهای ارتباطی مهم مرتبط با جاده خراسان بزرگ (جاده ابریشم)، دشت‌های مستعد کشاورزی و نواحی دارای منابع معدنی احداث شده‌اند. این قلاع علاوه بر برخورداری از ارتباط بصری متقابل، از مزایایی هم چون موقعیت‌های دفاعی مناسب، دسترسی پایدار به منابع آب و بهره‌مندی از ظرفیت‌های اقتصادی منطقه نیز برخوردار بوده‌اند. شواهد معماری نیز نشان می‌دهد که ساختار این استحکامات با شرایط محیطی سازگار شده و از طریق احداث حوض انبارها، دیوارهای دفاعی، برج‌های دیده‌بانی و مجموعه‌های معماری چندسطحی به نیازهای زیستی و دفاعی پاسخ داده است. این پژوهش نشان می‌دهد که متغیرهای جغرافیایی نقش تعیین‌کننده‌ای در مکان‌گزینی، سازمان فضایی معماری و تداوم حیات قلاع اسماعیلی دامغان داشته‌اند. این استحکامات را می‌توان بخشی از یک شبکه سرزمینی یکپارچه دانست که در راستای تحقق اهداف نظامی، اقتصادی، اداری و مذهبی دولت اسماعیلیه نزاری در شمال ایران شکل گرفته و توسعه یافته است.

کلیدواژگان: دامغان، اسماعیلیه نزاری، قلاع اسماعیلی، گردکوه، سامانه اطلاعات جغرافیایی (GIS)، منظر فرهنگی، متغیرهای جغرافیایی.

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