

THE CULTIC LANDSCAPES OF PHRYGIA

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ABSTRACT

THE CULTIC LANDSCAPES OF PHRYGIA

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M. Sc., Graduate Program in Settlement Archaeology

Supervisor: Assist. Prof. Dr. Geoffrey D. Summers

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This thesis examines Phrygian cultic sites in Western Phrygia from the perspective of landscape using a range of Geographical Information Systems (GIS) analyses. More specifically, it explores spatial relationships between these cultic sites and the regional geographical context with reference to certain environmental and cultural parameters. These include topography, geology, and distance to settlements, hilltop sites, and ancient roads. A total of 30 Phrygian cultic sites form the primary archaeological evidence. Secondary archaeological evidence covers a range of mound settlements and hilltop sites associated with Phrygian culture. The study heavily relies on the readily available archaeological site data from related publications and recent surveys in the region. Geographic datasets used include ASTER Global DEM and derived surfaces, as well as digital geological and historical maps. This study contributes to our understanding of Phrygian cultic sites by revealing certain patterns as to their locations. It also brings all the available site data from Western Phrygia together for the first time. Ultimately, it suggests that the “highlandscapes” of Phrygia with spectacular geological formations could have played a crucial role on the cultic site locations.

Keywords: Phrygia, Iron Age, Cult Monuments, Landscape Archaeology, GIS

ÖZ

FRİGYA BÖLGESİ KÜLT ALANLARININ PEYZAJI

Özarlan, Yasemin

Yüksek Lisans, Yerleşim Arkeolojisi

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Bu tezde Batı Frigya’da bulunan Frig költ alanları peyzaj odaklı bir bakış açısıyla coğrafi bilgi sistemleri (CBS) kullanılarak incelenmiştir. Frig költ alanları ile bölgesel coğrafi yapı arasındaki uzamsal ilişkiler, belli çevresel ve kültürel parametreler göz önüne alınarak araştırılmıştır. 30 Frig költ alanı bu çalışmanın temel arkeolojik verisini oluşturmaktadır. İkincil olarak kullanılan arkeolojik veri ise Frig költürüyle bağlantılı bir grup höyük ve tepeüstü yerleşmeyi kapsamaktadır. Çalışma arkeolojik veri açısından, konuyla ilgili bilimsel yayınlar ve yakın geçmişte yapılan yüzey araştırmalarına dayanmaktadır. Kullanılan coğrafi veri kümeleri, ASTER Global DEM ve bundan üretilmiş raster veri haritaları ile dijital tarihi ve coğrafi haritaları içermektedir. Tez, Frig költ alanlarına dair belli uzamsal örüntüleri ortaya çıkararak daha iyi anlaşılmasına katkıda bulunmaktadır. Ayrıca, Batı Frigya’da bulunan Frig költ alanları ile höyük ve tepeüstü yerleşmeleri ilk defa bir arada sunmaktadır. Sonuç olarak, görkemli jeolojik oluşumlara sahip yüksek Frigya yaylalarının költ alanlarının dağılımında önemli rol oynamış olabileceğini önermektedir.

Anahtar Kelimeler: Frigya, Demir Çağı, Költ Anıtları, Peyzaj Arkeolojisi, CBS

Biricik Anneme ve Babama

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CHAPTER I

INTRODUCTION

1.1 The Aim and Scope of the Thesis:

After the collapse of the Hittite Empire, around 1200 BC, Anatolia underwent a political and economic turmoil that perhaps lasted until the 9th century BC. Following this so-called Dark Age, due to the absence of written evidence, a major political power, with its capital at Gordion, 100 km west of Ankara today, emerged. This political entity, known as the Phrygian State, was one of the most prominent actors of the 1st millennium BC and it left permanent traces in the cultural history of Anatolia.

Under the Phrygian rule, perhaps from as early as the 10th century BC; until the arrival of the Persian Empire around 550 BC, the landscapes of mid-west Anatolia underwent significant changes through the construction of a great number of rock-cut monuments, some of which were dedicated to the Phrygian Goddess *Matar*. The aim of this thesis is to analyse these cultic sites through the lens of a landscape approach using Geographical Information Systems (GIS).

Phrygian cult monuments have been visited, examined and published by various scholars since the 19th century.¹ In most cases they were studied on an individual basis with structural and functional questions in mind. Fortunately, a consensus that these monuments were places of worship associated with cult activity has been reached. Many scholars also believe that the cults themselves were not new, but of earlier Anatolian origin which took on a very Phrygian character.

¹ See Leake 1824; Texier 1839; Ramsay 1882: 256-263; Körte 1898; Brandenburg 1906; Haspels 1971; Berndt 1986 and 2008; Tüfekçi Sivas 1999; Roller 1999; Fiedler 2003; Berndt-Ersöz 2006; Tamsü 2008.

This thesis, however, will neither question their cultic functions nor interrogate the cult activities involved. Instead, it will explore certain environmental and cultural factors that may have affected their spatial distribution. Therefore, the main objective of the thesis is to reveal the spatial patterns of these cultic sites by analysing the regional geographical setting with reference to certain environmental and cultural parameters. These include topography, geology, and distance to settlements, hilltop sites and major ancient roads.

Within this framework a total of 30 Phrygian cultic sites will be examined in the following chapters. These form the primary archaeological evidence. This low number is because some of the cultic sites will be treated as site complexes composed of monument clusters for practical purposes due to the extensive extent of the study area as well as unavailability of site data. The monuments include four main types, facades, niches, step monuments and idols. Step monuments and idols are usually found in combination. Secondary archaeological evidence will cover a range of mound settlements and hilltop sites associated with Phrygian culture. The study will also heavily rely on the readily available archaeological site data in related publications and recent surveys.

In Chapter II the archaeological and physical landscapes of the study area will be introduced and explained with a critical approach. The third chapter will be dedicated to the elaboration of the methods used in the study as well as data collection procedures. This will be later followed by a section of data analysis and results. The fourth and fifth chapters will be devoted to the discussion and conclusion. In the end the study will contribute to our understanding of the Phrygian cultic sites and their distributions over the archaeological landscape of Phrygia. It will also bring all the available site data from Western Phrygia together for the first time.

1.2 The Chronology Problem:

The absence of an absolute chronology for the Phrygian cultic sites is the main bottleneck of this thesis. One reason is that there are not any historical records that provide information about their dates. When this is combined with the lack of stratigraphical evidence related to site context it becomes yet more vexing. Nevertheless, there have been several controversial attempts for a relative dating, particularly for the facades, which entirely relies on their forms and decorations, and sometimes pottery and inscriptions.²

Earlier suggestions give a date around late 8th century BC for some of the architectural facades based on the inscriptions of the so-called *Midas Monument*, the largest of the known cult monuments.³ This is because these inscriptions were thought to have been contemporary with the reign of King Midas.⁴ Later, however, most facades were dated to early or late 6th century BC.⁵ For the abandonment of the unfinished facades, e.g. *the Unfinished Monument* and *the Areyastis facade*, on the other hand, a date around mid 6th century BC was suggested due to the Persian invasion at that time. In terms of decoration, links were also established between 6th century Greek art and the facades with floral motifs or animal figures.

In a recent attempt step monument without inscriptions was suggested to have been the earliest type of all Phrygian cult monuments, hence dated to the Early Phrygian Period (950-800 BC) based on the pottery evidence from *Dümrek*.⁶ The earliest

² Akurgal 1955; Haspels 1971; Işık 1987; DeVries 1988; Sams 1995; Roller 1999; Tüfekçi Sivas 1999; Fiedler 2003; Berndt-Ersöz 2006.

³ Haspels 1971: 102-108.

⁴ The reign of King Midas is thought to have corresponded to the 8th century BC in the light of evidence from two separate ancient sources: the annals of the Assyrian King Sargon II and Classical Greek and Latin literature.

⁵ Berndt-Ersöz 2009: 11-19.

⁶ Berndt-Ersöz 2009: 17.

anthropomorphic images of the Mother Goddess Matar, on the other hand, were dated to the Middle Phrygian Period (800-550 BC) in the same study.⁷

As a result of these contradictory ideas and the absence of solid evidence, this thesis will neither deal with their chronologies nor integrate them into GIS. This topic will be explored through future research. What this study will be focusing on is the Phrygian landscape of the 5th century BC by when all the monuments had already been constructed.

The lack of a chronology for the majority of the Phrygian settlements and hilltop sites also poses the same problem for the thesis. Most information about their dates comes from the published surveys⁸ which are based on surface pottery and sometimes inscriptions. Therefore, in terms of settlement, we will be only dealing with what might be Phrygian.

⁷ Berndt-Ersöz 2009: 17.

⁸ Efe 1995; Tüfekçi Sivas and Sivas 2003; Tüfekçi Sivas and Sivas 2004a; Tüfekçi Sivas and Sivas 2004b; Tüfekçi Sivas and Sivas 2004c; Tüfekçi Sivas and Sivas 2005, Tüfekçi Sivas and Sivas 2007.

CHAPTER II

THE STUDY AREA

The study area, covering almost entire Eskişehir province together with small portions of Afyonkarahisar, Ankara, and Kütahya provinces, extends from Mihalıççık, Eskişehir in the north to İhsaniye, Afyonkarahisar in the south, and from Sabuncupınar Village, Kütahya in the west to Yassihöyük Village, Polatlı, Ankara in the east (Figure 2.1). Stretching between the latitudes of 40°3'39,185"N and 38°54'8,164"N and the longitudes of 30°6'21,119"E and 32°1'19,298"E, the study area has a total extent of nearly 1.524.532 km² and an average altitude of 1000m above sea level. The boundary of the study area adheres to those areas covered in previous archaeological surveys⁹ carried out in the region and therefore, contains the central towns of Eskişehir and Kütahya alongside the towns of Alpu, Beylikova, Günyüzü, Han, İhsaniye, Mahmudiye, Mihallıççık, Polatlı, Seyitgazi, and Sivrihisar.



Figure 2.1 The study area

⁹ Tüfekçi Sivas 2002; Tüfekçi Sivas and Sivas 2003; Tüfekçi Sivas and Sivas 2004a; Tüfekçi Sivas and Sivas 2004b; Tüfekçi Sivas and Sivas 2004c; Tüfekçi Sivas and Sivas 2005; Tüfekçi Sivas and Sivas 2007.

2.1 The Archaeological Landscape

The study area covers what is defined as *West Central Phrygia* and a small portion of *East Central Phrygia*. West Central Phrygia is a geographical term used to describe the Phrygian territory extending beyond the Sivrihisar Mountains (Figure 2.16) towards west where the Phrygian State was the major political and cultural power from as early as the 10th century BC until the Lydian domination in the first half of the 6th century followed by the arrival of the Persian Empire around 547/46 BC. East Central Phrygia, on the other hand, refers to those areas extending from the east edge of the Sivrihisar Mountains to Kızılırmak, or the *River Halys* in the east.

Perhaps the main cultural component of West Central Phrygia is the *Highlands of Phrygia*, another geographical term first introduced by C.H. Emilie Haspels¹⁰ and later used by following researchers. It extends roughly over the mountainous region between Eskişehir, Kütahya, and Afyonkarahisar. This highland area, divided by spectacular natural valleys and embellished by numerous Phrygian rock-cut monuments, is still referred as *Frig Vadisi* (the Phrygian Valley) today by local governors and most travellers in Turkey.

The archaeological landscape of the study area is mainly characterized by mound settlements, cult monuments, hilltop sites, burial tumuli, and rock-cut tombs associated with Phrygian culture. It also includes *Gordion*, the capital of the Phrygian State, which falls into *Central Phrygia* geographically. While the westernmost extent of the Phrygian territory still remains unknown, the Sakarya River, or the *River Sangarius*, with Gordion in the north serves as a kind of transition zone between West Central Phrygia and East Central Phrygia. The general characteristics and descriptions of the archaeological features used in this study are given below:

¹⁰ Haspels 1971.

2.1.1 Phrygian Settlements

A great majority of the known Phrygian settlements in the region are höyük-type settlements with varying sizes located mainly on the alluvial plains within the Sakarya and Porsuk river basins (Figure 2.2). There are also several other sites identified either as a slope settlement, e.g. *Karacakaya* and *Gökçekisik*,¹¹ or an urban complex, e.g. *Pessinus*. However, their distributions, functions and sizes are still based on very poor archaeological evidence and not really clear. Moreover, their quantities and chronologies are still vaguely known due to lack of systematic excavation and survey work in the region. Therefore, it is not possible to establish a rank order among these settlements. Of the major settlements, *Gordion*, *Dorylaion*, and *Midaion* relatively provide the most information.

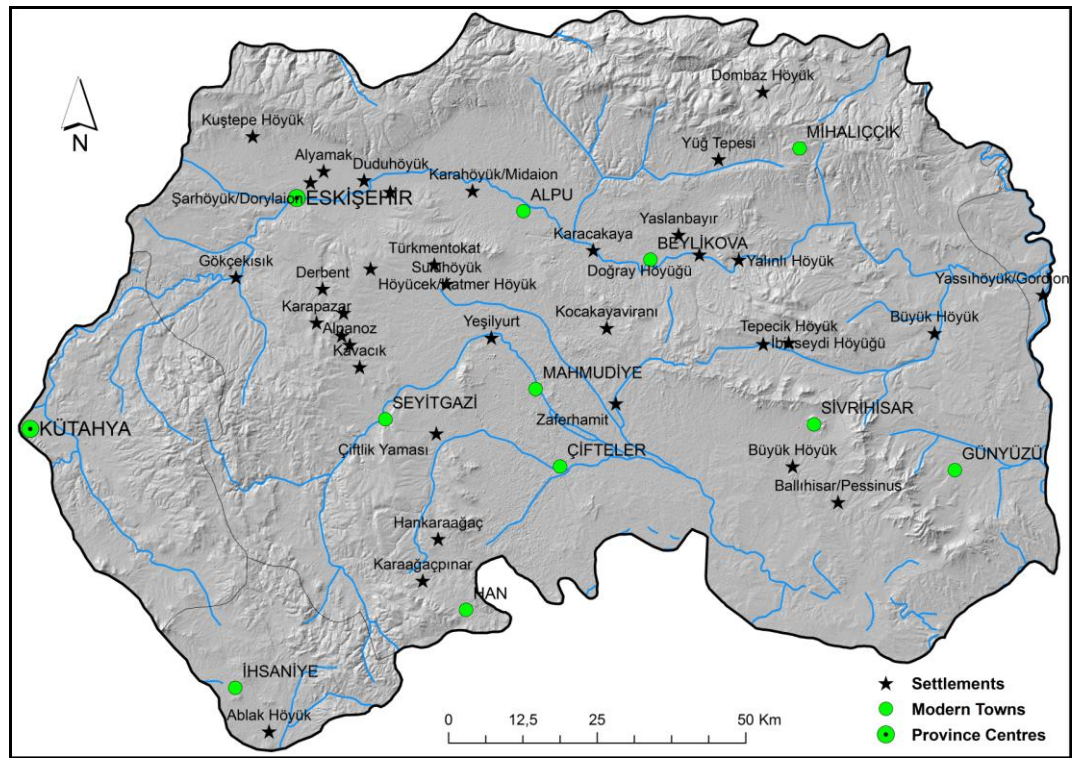


Figure 2.2 Phrygian settlement locations

¹¹ Tüfekçi Sivas 2002, Tüfekçi Sivas and Sivas 2003.

Gordion/Gordium (Figure 2.3) was a political, economic and military urban centre from as early as the 9th century BC until the Persian invasion in the mid 6th century BC.¹² The city, however, maintained its Phrygian character perhaps until the arrival of Alexander the Great in 334 BC. The site, located on the Sakarya River in Yassihöyük Village, Polatlı, Ankara, has been a prevailing subject of systematic research by various scholars since 1950.¹³ It provides a well-established absolute chronology for the Phrygian Period as well as the most diagnostic material evidence associated with Phrygian culture.¹⁴ Composed of a citadel mound, a fortified Lower Town and a large Outer Town, very typical of ancient Anatolian capitals, the settlement has a walled extent of more than one square kilometre with numerous extramural burial tumuli in the vicinity.¹⁵ Its position on ancient east-west trade routes must have played a significant role in its long occupation history and gradual growth as a prosperous city during the 1st millennium BC.



Figure 2.3 *The citadel gate at Gordion and the tumuli (Photo: Geoffrey D. Summers 2008)*

¹² Sams 2007: 56.

¹³ In 1900 Alfred and Gustav Körte, known as Körte brothers, carried out a single season of excavation work at Gordion (Körte and Körte 1904).

¹⁴ Voigt 2007: 69.

¹⁵ Some of these burial tumuli were constructed on the houses that are part of a nearby settlement.

Dorylaion/Dorylaeum, also known as *Şarhöyük*, located in modern Eskişehir town centre, was another urban centre during the 1st millennium BC (Figure 2.4). The site, excavated since 1989, provides very limited information about the Phrygian Period whereas its importance as a major cultural centre is evident from ancient written sources and inscriptions.¹⁶ Located at the intersection point of ancient east-west and north-south trade routes, *Dorylaion* is another typical multi-layered höyük formation consisting of a mound and a lower city as well as defensive structures. The archaeological record has shown that it was occupied uninterruptedly from the 5th millennium BC until the Ottoman times.¹⁷ However, the size and layout of the Phrygian occupation on the site is still vague and remains to be seen through the ongoing excavation work.¹⁸

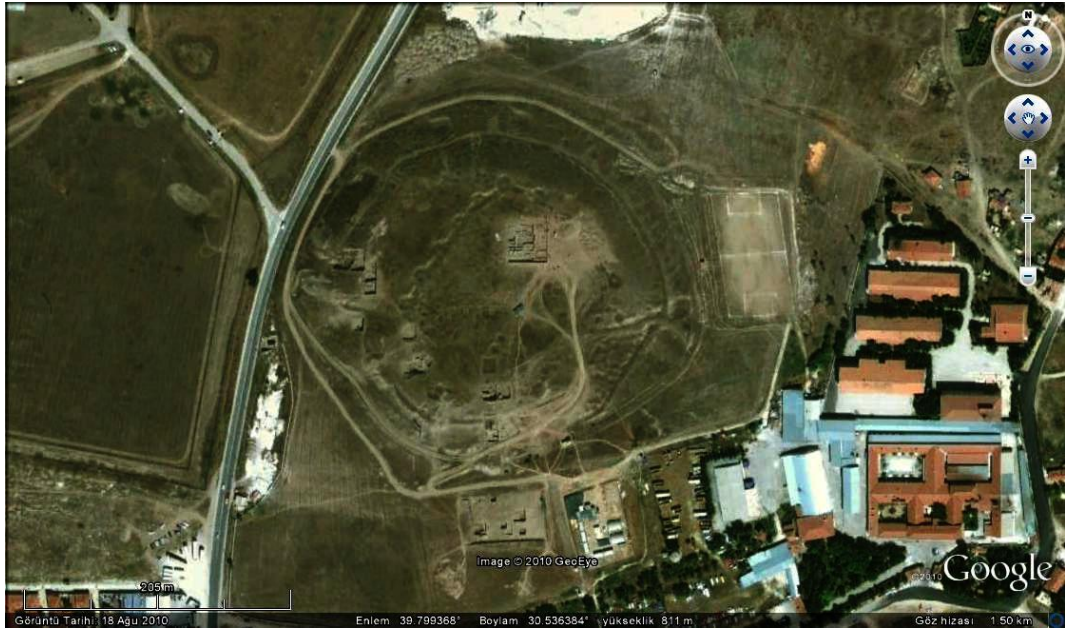


Figure 2.4 Dorylaion from the air (Source: Google Earth 2010)

¹⁶ Darga 1993: 481.

¹⁷ Darga 1993: 481-501.

¹⁸ Darga, Tüfekçi Sivas and Sivas 2003: 47-59.

Midaion/Karahöyük, located approximately 30 km to the east of modern Eskişehir town centre, is another large mound formation (Figure 2.5) where the Phrygian occupation is represented by surface pottery evidence only. It was named as Midaion after a coin found on the site with the name of King Midas inscribed on it.¹⁹ A very systematic archaeological survey²⁰ was carried out on the site in 2004 which showed that the site was occupied uninterruptedly from the 3rd millennium BC until the Islamic Period. The archaeological evidence mainly includes high concentrations of pot sherds, architectural remains, metal objects, coins, several statues, as well as a large necropolis area located by the höyük. The size and layout of the Phrygian settlement on the site is not yet clear.



Figure 2.5 Midaion from the air (Source: Google Earth 2010)

¹⁹ Arık 1956: 29.

²⁰ Bilgen 2006: 403-405.

2.1.2 Phrygian Hilltop Sites

Hilltop sites refer to those sites located on high rocky hills or outcrops with commanding views over the surrounding areas and valleys (Figure 2.6). They are described as either *kales*, or *look outposts*,²¹ or *kale-type sites*²² because most of them have evidence for defensive structures. These sites were identified as Phrygian, mainly based on the pot sherds found on surrounding slopes and fields as well as seldom architectural evidence.²³ Since a majority of them are also intervisible over considerable distances, Haspels argues that these *kales* must have functioned as military strongholds in times of need and communicated with each other through signals, providing mutual assistance.²⁴



*Figure 2.6 A view of Gökğöz, Pişmiş and Kocabaş Kale respectively
(Photo: Yasemin Özarslan 2009)*

²¹ Haspels 1971: 29-72.

²² Tüfekçi Sivas and Sivas 2003.

²³ Haspels 1971: 29-72.

²⁴ Haspels 1971: 34.

Built on bedrock formations on high plateaus with vertical edges and flat-tops, or rarely on isolated rocks, these hilltop sites contain certain features such as fortification walls of stone blocks, gate structures, cut-out floors, subterranean staircases, water cisterns, silos, post holes, and tomb chambers, etc. cut into bedrock. Among them, *Midas City*, *Kümbet Asar Kale* and *Pişmiş Kale*, for instance, have substantial evidence for fortifications and occupation.²⁵ The rest, however, possesses only little or no evidence for settlement. Moreover, their plans and sizes are unclear. There are also unfortified hilltop sites such as *Göçeri Kale*.²⁶ A number of these hilltop sites, e.g. *Demirli Kale*, *Doğanlı Kale* and *Midas City*, were still in use in later periods.²⁷ When the small scale of these hilltop sites and poor evidence are taken into account, they cannot be considered as large urban centres nor as major settlements inhabited by substantial amounts of people. This explains why they are simply referred as hilltop sites rather than settlements in this study.



***Figure 2.7 Midas City with the Unfinished Monument in the middle
(Photo: Yasemin Özarıslan 2009)***

²⁵ Haspels 1971: 40.

²⁶ Haspels 1971: 68.

²⁷ Haspels 1971: 48-60.

Of the hilltop sites (Figure 2.8), *Midas City* (Figure 2.7), excavated in 1930s and 1940s, is described as a city in the literature.²⁸ In the excavations a small area consisting of residential buildings was exposed. However, the size and function of this excavated area is still debatable. So is the date. Therefore, it is difficult to describe it as a typical city especially when the evidence is poor. As suggested by a number of earlier researchers,²⁹ *Midas City* seems to have functioned as a regional cult centre rather than a political one with little occupation evidence. This is apparent from the number of cult monuments, 82 in total, related to this site. The cult monuments at *Midas City* are also larger in size compared to other cultic sites. The site was also used in Hellenistic, Roman and Byzantine periods as seen from the inscriptions and excavated material.

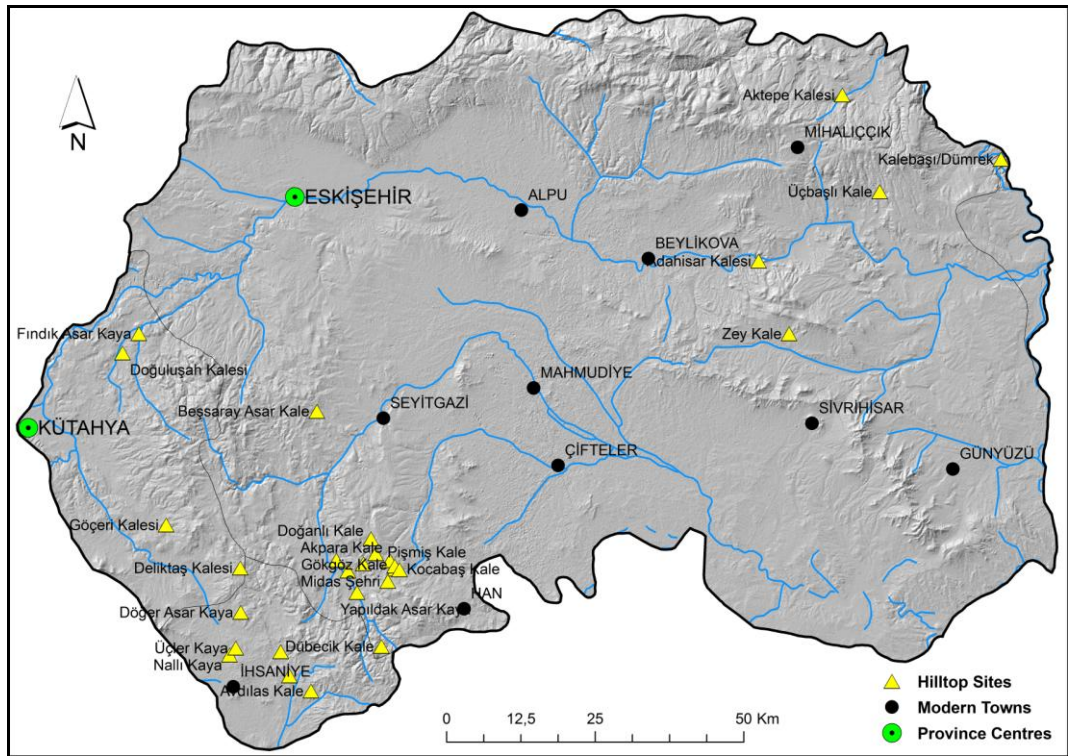


Figure 2.8 Phrygian hilltop site locations

²⁸ Çambel 1951; Haspels 1951; Gabriel 1952 and 1965.

²⁹ Tüfekçi Sivas 1999; Berndt-Ersöz 2006.

2.1.3 Phrygian Cultic Sites

The main characteristic of the Phrygian cultic sites (Figure 2.9) is that they are composed of at least one or more rock-cut monuments of various sizes (See also Figure 3.1). These cult monuments, also called *rock-cut shrines*,³⁰ possess certain structural evidence of cultic and iconographic importance. They are usually analysed under four main types as facades, niches, step monuments and idols.

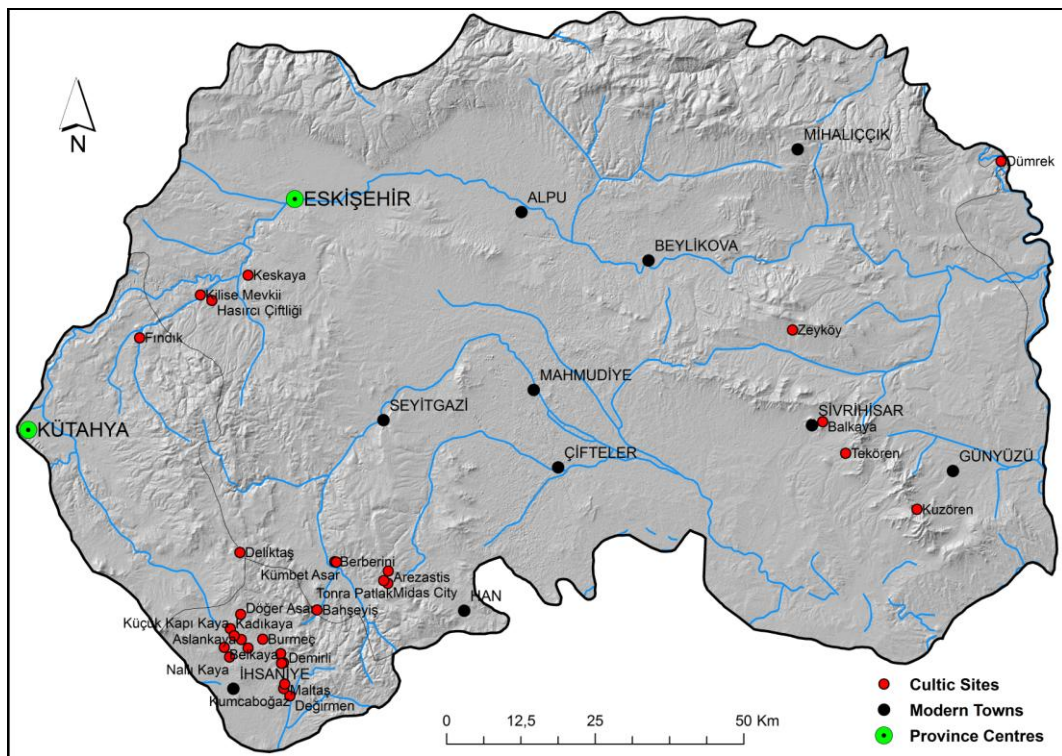


Figure 2.9 Phrygian cultic site locations

Facades are divided into two main sub-groups as *architectural facades* and *small facades*. **Architectural facades** are colossal monuments carved onto vertical sides of natural rock plateaus a few meters above ground (Figure 2.10). Their most prominent feature is a focal **niche** with a surrounding facade decorated with geometrical motifs

³⁰ Berndt-Ersöz 2006.

accompanied by a pitched roof above with an akroterion at the top and a gable field below.³¹ This is one reason why they are interpreted as “building, or architectural facades” because they are thought to have imitated the front of a building of public importance.³² Another important characteristic of the architectural facades is that they can be seen from some distance since their dimensions can reach 17 m in length and 16 m in width, e.g. *the Midas Monument*.



Figure 2.10 Arslankaya Facade (Photo: Ben C. Cockson 2006)

³¹ Tüfekçi Sivas 1999: 182-184; Berndt-Ersöz 2006: 21.

³² Tüfekçi Sivas (1999: 180) and Berndt-Ersöz (2006: 194) both argued that they must have imitated the facade of Phrygian megaron.

Small facades, on the other hand, were similarly designed and constructed with the architectural ones.³³ They differ from the architectural facades in size so they are visible only when they are approached (Figure 2.11). Moreover, their niches are shallower. Some of them are also carved into isolated rocks. In total there are 9 architectural and 20 small facades that have been recorded until now.



Figure 2.11 Büyük Kapı Kaya Facade (Photo: Ben C. Coockson 2006)

Representing an open doorway, some **niches**, rectangular in shape and plan, had either a free standing, or a rock-cut relief image of the Phrygian Goddess *Matar* inside.³⁴ *Matar* is usually depicted with a human body wearing a *polos* with a veil fastened beneath hanging down both sides and sometimes accompanied by animal

³³ Tüfekçi Sivas 1999: 115.

³⁴ Berndt-Ersöz 2006: 40.

figures.³⁵ Not all the facades have a niche or an image as their focal point, e.g. *Arezastis Facade*. These facades are believed to be incomplete. Some facades also have a shaft behind whose function is not yet clear, e.g. *Maltaş* and *Bahşeyiş*.³⁶ A number of them have inscriptions either on a side or above the roof including Phrygian letters. **Niches** are sometimes found alone without a surrounding facade.



Figure 2.12 The so-called King's Throne at Midas City is a very nice example to step monuments with idols and Phrygian letters at the top (Photo: Ben C. Cockson 2006)

Step monuments also simply referred as step altars, or step thrones in the literature are the most common type of Phrygian cultic sites with a wider geographical distribution (Figure 2.12). In a recent study it was stated that their number has

³⁵ Berndt-Ersöz 2006: 59.

³⁶ Tüfekçi Sivas (1999: 197) proposed that the shafts were filled with sacrifice blood during rituals whereas Berndt-Ersöz suggested that they could have been used for oracular activity (1998: 98) or divination (2006: 193).

reached 93 in total.³⁷ In the same study a new typology was also suggested for these monuments.³⁸ According to this new attempt, three main types classified into ten sub-types were identified based on the current evidence as shown in Figure 2.13 below. Similarly carved into natural rock outcrops, these monuments are composed of steps of various size and number (7 at max.) leading to an altar found at the top with/without an idol, or a double-idol behind. An **idol** is a rock-cut anthropomorphic relief image of the Mother Goddess. Idols, either single or in groups, may also exist independently of step monuments (Figure 2.14). The majority of the step monuments have a seat-shaped area at the upper part that looks like a throne whose function is still controversial. Examples of built versions of step monuments³⁹ and reliefs of idols⁴⁰ are also known from other regions outside the study area. Larger step monuments usually possess inscriptions (Figure 2.12).

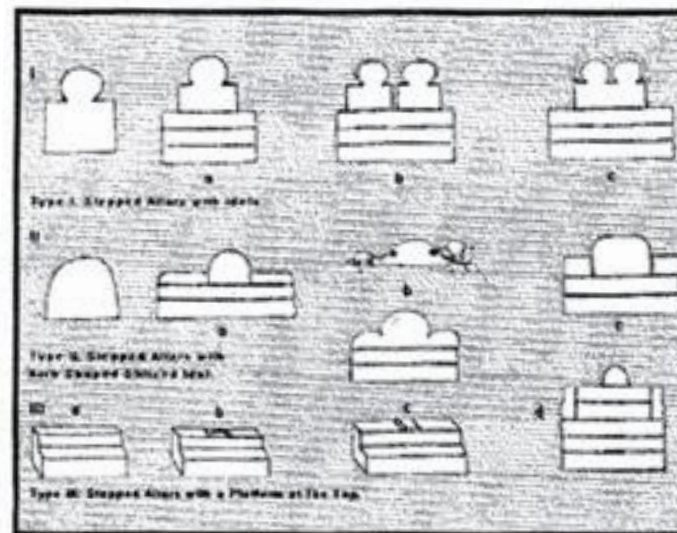


Figure 2.13 The known step monument types
(Source: Tamsü 2008: 443)

³⁷ Tamsü 2008: 439.

³⁸ For details see Tamsü 2008: 439-445.

³⁹ Built step monuments are composed of built steps instead of carved steps leading to an idol similarly at the top (Summers *et al.* 2006: 10).

⁴⁰ Idols, or reliefs of idols were also reported from Ankara (Prayon 1987), from Boğazköy, Çorum (Neve 1993: 621-652) and Kerkenes, Yozgat (Summers 2006: 647-59).



*Figure 2.14 An idol carved onto a rock face at Midas City
(Photo: Yasemin Özarslan 2009)*

Most Phrygian cult monuments, particularly the step monuments, have an eastern orientation so they face the rising sun.⁴¹ However, most facades seem to have been carved onto available sides of rock formations looking down the valleys with no orientation concerns. In functional terms, altars were probably used for presenting votive gifts or sacrifice to the cult. A number of them are located close to city gates, hence must have had a protective role for the city.⁴² A spatial relationship between step monuments and agricultural lands was also suggested.⁴³ Some were associated with springs.⁴⁴ Several monuments are also found in funerary contexts.

⁴¹ Berndt-Ersöz 2006: 16-21.

⁴² Berndt-Ersöz 2006: 158.

⁴³ Tüfekçi Sivas 1999: 197.

⁴⁴ Tüfekçi Sivas 2003: 194.



Figure 2.15 *The so-called Midas Monument at Midas City*
(Photo: Yasemin Özarlan 2009)

The majority of the cult monuments have enough space in front for public gatherings and ritual activities. Particularly, some facades were supplemented by additional external features such as *stoa*, which probably had a function during such occasions, e.g. *the Midas Monument* (Figure 2.15). A distinction was also made between the architectural facades and smaller monuments by suggesting that the former were dedicated to the State whereas the latter belonged to local elites, or landowners.⁴⁵ In a recent attempt some facades were also suggested to have been Lydian royal manifestations aimed for the Phrygian society.⁴⁶

⁴⁵ Tüfekçi Sivas 1999: 192.

⁴⁶ Berndt-Ersöz 2006: 176.

2.2 The Physical Landscape

2.2.1 Topography and Geomorphology

The current topography of the region is characterized by large alluvial plains, high mountain ranges, rocky plateaus, deep and broad valleys mainly formed as a result of tectonic activity, and a large stream network which has had a significant impact on the landforms (Figure 2.16). The highest peak is Türkmen Dağ (1,824 m) located in the west whereas the lowest point is the valley to the north of the Sündiken mountain range (262 m). The major rivers in the region are the Sakarya and its tributary Porsuk, flowing approximately 460 km long from west to east. The alluvial plains suitable for agriculture within these two flat river basins are other prominent features of this landscape. The only natural lake in the study area is Emre Gölü, located in the southwest. The climate is typical continental climate with very hot and dry summers and very cold and dry winters. Vegetation includes forests of pine, oak, beech, hornbeam, cedar, poplar, and juniper whereas the larger portion of the region is characterized by pasture and grassland.⁴⁷

The northern section of the region (Figure 2.16) is surrounded by the Sündiken mountain range, and the Porsuk River as well as fertile plains extending on both sides of the river along the broad and flat Porsuk Valley where elevation is ca. 750m. The southwest section has a rather rugged and higher terrain characterized by a series of mountains and hills with flat tops and sharply sloping sides divided by deep valleys as well as their extensions. This is the highest zone with varying elevations over 1100 m above sea level that contains Türkmen Dağ, Yazılıkaya Plateau and Şaphane Dağ. In the central part, also called the Upper Sakarya Basin, the landscape is represented by the great Sakarya River and its tributaries bending towards northwest and large flat alluvial plains where the average altitude is 850 m. To the southeast lies the Sivrihisar mountain range with elevations from 1000 m to 1600 m,

⁴⁷ Eskişehir İl Çevre Durum Raporu 2008.

a relatively smaller highland region. The Sakarya River and surrounding flat alluvial plains running from north to south articulate the eastern edge of the study area.

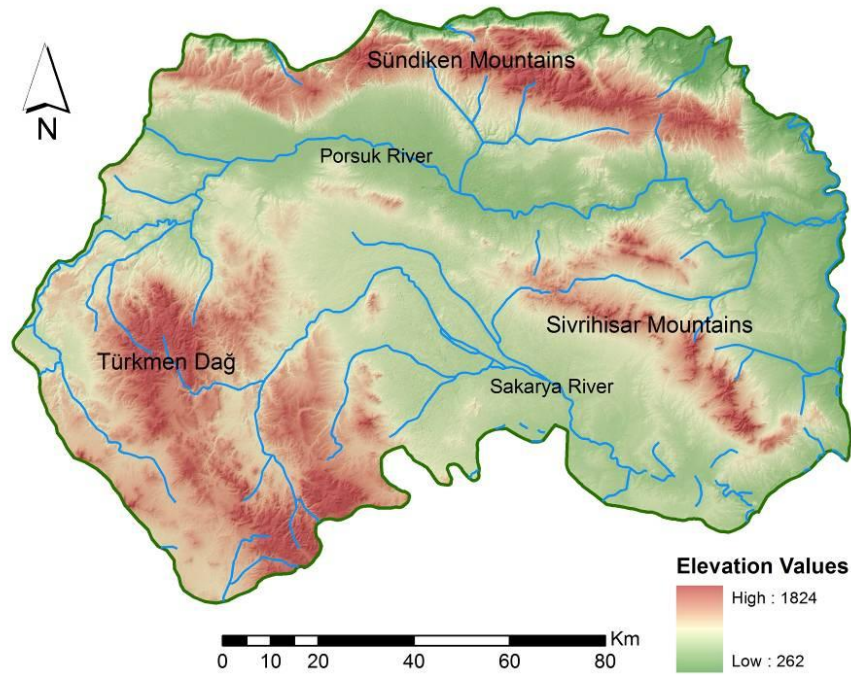


Figure 2.16 The major geomorphological features within the study area

2.2.2 Geology

The geological formations in the study area are largely a result of tectonic activities and east-west fault systems.⁴⁸ The Eskişehir Graben, extending from Bursa to the west of Tuz Gölü and passing through the study area with a northwest-southeast orientation is an important regional tectonic factor both on the geological and geomorphological formations. The main geological units (Figure 2.17) include various metamorphic, volcanic, and sedimentary rock types as well as Quaternary

⁴⁸ Gözler *et al.* 1985: 40-54.

alluviums.⁴⁹ The oldest formations in the region are Triassic schist and ophiolitic melange. Upper formations include rocks such as conglomerate, sandstone and limestone dated to Jurassic and Paleocene. The Eocene Period is represented by a layer of conglomerate, marl, sandstone, and limestone (approx. 250-300 m thick) overlaid by layers of conglomerate, claystone, marl, andesite, andesitic tuff, and limestone dated to the Miocene Period (100-400m). The Pleistocene is represented by conglomerate, sandstone, and limestone (100-300m) whereas the Pliocene is composed of volcanic clay, tuff, and basalt. The youngest unit is Quaternary alluvial deposits including gravel and sand mostly.

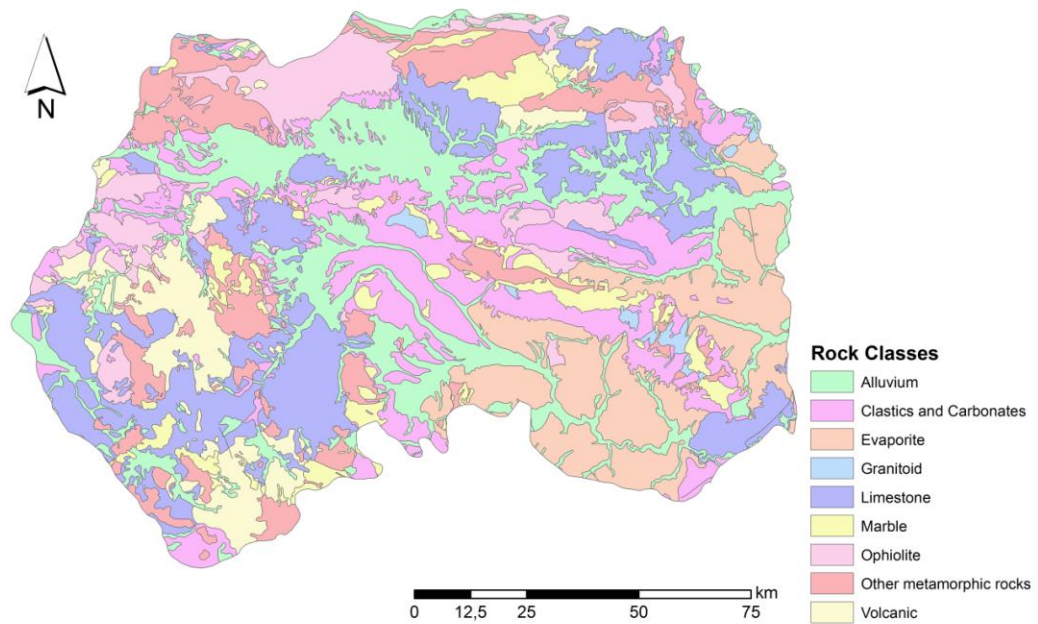


Figure 2.17 The geological zones within the study area

⁴⁹ Eskişehir İl Çevre Durum Raporu 2008.

CHAPTER III

DATA, METHODOLOGY AND ANALYSIS

3.1 Landscape Archaeology

Landscape archaeology, an integral part of regional studies in archaeology today, can be described as an holistic approach to the study of archaeological landscapes which investigates the reciprocal relationships between people and the landscape they inhabit using multiple theories and methods ranging from ecological to phenomenological. The main aim of the approach is to explore the development of cultural landscapes by examining social, political, economic, environmental, religious and symbolic aspects with a focus on the human factor and reveal their cultural and historical significance.

The history of systematic landscape and regional studies goes back to the early 20th century in Britain when cultural landscapes were being examined within a historical context through aerial photography and regional maps.⁵⁰ This was followed by the more geographical and economic approaches of 1960s and 1970s in the form of settlement archaeology in a highly deterministic manner. With the introduction of settlement studies the focus of research has shifted from site-based archaeology to the analysis of wider settlement areas and patterns, site-catchments, territories, macro-environments, and eventually to landscapes and regions.⁵¹ Therefore, archaeologists have started to investigate off-site natural and cultural features such as ancient roads, track ways, agricultural lands, irrigation systems, quarries, rivers, lakes, and vegetation, etc. for a better understanding of past political, social and

⁵⁰ See Crawford 1923.

⁵¹ See Adams 1965; Flannery 1968; Johnson 1975; Clark 1977; Vita-Finzi and Higgs 1979.

economic systems.⁵² This increasing application and significance of off-site and regional archaeology has led to the emergence of a sub-discipline called landscape archaeology which has its own body of theory and method today.

Earlier approaches to archaeological landscapes were rather based on ecological and spatial models. In 1990s, however, a more humanistic strand grew out of the post-processual school of thought as a reaction by which archaeologists have begun to examine more cognitive and symbolic dimensions of landscapes.⁵³ According to this later post-positivist strand, how landscapes were perceived and understood by people in the past is also crucial for a complete understanding of archaeological landscapes because people attach meanings to certain landscapes and those landscapes carry certain elements of symbolism. Therefore, one aim of archaeology is also to reveal those meanings attached to landscapes by people in the past by looking at certain natural and cultural elements in the archaeological record including monuments, gardens, mountains, caves, springs, etc. and by investigating concepts such as ritual, power, identity, and memory. In other words, it is to explain conceptual and cognitive factors behind the development of particular landscapes.

The rapid increase in the use of landscape concepts has led to a change in archaeological thinking about landscape as well. Landscape is no longer viewed as a passive background to cultural activity, but rather as an active and more complex part of human existence. In other words, landscape is now described as something more than a physical setting for past human activity and historical events, but rather as a phenomenon. In fact, the widely accepted notion among most landscape archaeologists of today is that “people shape the landscape they inhabit and they are shaped by it.” In this study the landscape of Western Phrygia will be analyzed through the glasses of such an approach.

⁵² See Willey 1999; Sanders 1999; Wilkinson 2003.

⁵³ See Bender 1993; Ashmore and Knapp (eds.) 1999; Bradley 2000; Tilley 2006; Bender *et al* 2007.

3.2 Landscape Archaeology and GIS

Archaeology is a very spatially oriented discipline by its very nature. Spatial distributions of artefacts, features and sites are the essential components of archaeological investigations. In this respect, GIS have great potential to be a valuable tool for archaeology especially for landscape archaeology. In fact, the accessibility and relative ease of use of GIS software and satellite imagery has dramatically improved our ability to look at the archaeological record on a landscape scale.

Because of the ever-changing nature of its technology, GIS is not simple to define. Very briefly GIS can be defined as a computer system used to collect, display, manipulate, manage and store spatial information. Unlike Computer Aided Drawing (CAD), it goes beyond simple map-generating by incorporating database and statistical functionality. It is an invaluable tool for handling large geographical datasets. In this study GIS will be used as a practical toolkit to investigate certain relationships of cultic sites to each other and their natural and cultural environment.

3.3 Data Collection and Processing

3.3.1 A Geospatial Database

The first step was to prepare a spreadsheet containing the coordinate pairs and attributes for the cultic sites using OpenOffice.org Calc.⁵⁴ Another spreadsheet was also prepared for the settlements and hilltop sites including as much attribute information as possible. These spreadsheets were then saved as .dbf files and

⁵⁴ **OpenOffice** is an open-source application suite containing tools for word processing, spreadsheets, presentations, graphics and databases. It can be downloaded and used completely free of charge for any purpose from <http://www.openoffice.org/>.

imported into ArcMap, a component of ArcGIS,⁵⁵ as point shape files. As a result, a geospatial database containing all the data necessary for the later GIS analyses was built which was updated gradually at various stages for more information. All the later attribute datasets such as elevation and site distances were produced in ArcMap and managed through ArcCatalog.

3.3.1.1 X,Y Data (Coordinate Pairs)

The X,Y data for site locations were largely provided by Prof. Dr. Taciser Tüfekçi Sivas from Anadolu University who had collected them with a hand-held GPS during her archaeological surveys in the region over the years. A number of coordinate pairs were also taken from Ben Claasz Cookson's personal database from Bilkent University, who had also collected GPS points during his own travels in the region.

The accuracy of all these point data was later improved by Google Earth.⁵⁶ The rest was acquired through field visits and Google Earth based on the information given in previously published maps and descriptions by Haspels,⁵⁷ Efe,⁵⁸ Tüfekçi Sivas and Sivas,⁵⁹ Berndt⁶⁰ as well as the TAY Project database.⁶¹

⁵⁵ **ArcGIS** is a widely used commercial suite consisting of a group of Geographic Information System (GIS) software products produced by ESRI (<http://www.esri.com/software/arcgis/index.html>).

⁵⁶ **Google Earth** is a virtual globe, map and geographical information program originally created by Keyhole, Inc. and later acquired by Google. It maps the earth through images obtained from satellite imagery, aerial photography and GIS 3D globe.

⁵⁷ Haspels 1971.

⁵⁸ Efe 1995.

⁵⁹ Tüfekçi Sivas and Sivas 2002; Tüfekçi Sivas and Sivas 2003; Tüfekçi Sivas and Sivas 2004a; Tüfekçi Sivas and Sivas 2004b; Tüfekçi Sivas and Sivas 2004c; Tüfekçi Sivas and Sivas 2005; Tüfekçi Sivas and Sivas 2007.

⁶⁰ Berndt 2002; Berndt 2008.

⁶¹ **TAY Project** is an entirely independent organisation whose goal is to build a chronological inventory of findings for the cultural heritage of Turkey and share it with the international community. An extensive database for site locations and related attributes is available through TAY Project website at <http://www.tayproject.org/>.

3.3.1.2 Attribute Data

The attribute data used in this study are, similarly, based on previously published studies and surveys carried out in the region. The attribute data for the cultic sites include site names; province and village names; monument types; monument counts per site as well as publications used⁶² (Appendix A and B). The chronological divisions of the sites were excluded from the database due to the reasons discussed in Chapter I page 3 above. The datasets for the settlements and hilltop sites, on the other hand, cover site names; province and village names; site types and dimensions (length, width and height above ground) where available as well as publications used (Appendix C).

3.3.2 DEM and Derived Surfaces

Any topographical and landscape analysis in a GIS environment is realised on a Digital Elevation Model (DEM). A DEM, also known as Digital Terrain Model (DTM), is a digital representation of the earth's surface which records height above sea level either in a raster format or in a triangular irregular network. A raster DEM is a grid of elevation values, from which it is possible to derive a variety of secondary products, including terrain slope, aspect and hillshade surfaces.

The DEM used in this study was generated from ASTER data provided and supported by the National Aeronautics and Space Administration (NASA).⁶³ For this purpose, four separate ASTER Global DEM tiles with 30 meter resolution were

⁶² Haspels 1971; Tüfekçi Sivas 1999; Berndt-Ersöz 2006; Bozdağ 2009.

⁶³ **ASTER** (Advanced Spaceborne Thermal Emission and Reflection Radiometer) is an imaging instrument flying on Terra, a satellite launched in December 1999 as part of NASA's Earth Observing System (EOS). ASTER is a cooperative effort between NASA, Japan's Ministry of Economy, Trade and Industry (METI) and Japan's Earth Remote Sensing Data Analysis Center (ERSDAC). ASTER is being used to obtain detailed maps of land surface temperature, reflectance and elevation (<http://asterweb.jpl.nasa.gov/>).

downloaded from NASA's official website,⁶⁴ converted into ESRI GRID format and mosaicked together in ArcMap. Then this DEM was clipped with the boundary polygon created for the study area. Later two derived surfaces, hillshade and slope maps, were generated from the DEM by using ArcMap/Spatial Analyst/Surface Analysis tool. Lastly the coordinate system and geographic projection of all the datasets were set on WGS 1984 UTM, zone 36N.

3.3.3 Ancient Roads

The ancient road network map used in the thesis was digitized from *The Barrington Atlas of the Greek and Roman World*,⁶⁵ an extensive historic atlas including colour topographic maps at 1:500,000 and/or 1:1,000,000 scales of ancient Asia, Europe and North Africa. The Atlas offers an up-to-date presentation of ancient geography and landscapes from Archaic Period (550 BC) to Late Antiquity (640 AD) based on epigraphic and archaeological data.

The map used in this thesis was digitised from “Map 62 Phrygia” compiled by Drew-Bear⁶⁶ whose work is mainly based on epigraphic evidence and earlier maps by Ramsay⁶⁷ and Calder.⁶⁸ The original map shows major settlement locations as well as major and minor Roman Roads passing through Phrygia, but excludes vegetation.⁶⁹ The main limitation with this map is that it is heavily based on Roman Phrygia due to lack of inscriptions from earlier periods. Therefore, there are only a few toponyms

⁶⁴ Available at: <http://asterweb.jpl.nasa.gov/gdem.asp>.

⁶⁵ Talbert, R. J. A. (ed.) 2000.

⁶⁶ Drew-Bear 2000.

⁶⁷ See Ramsay 1895 and 1897.

⁶⁸ See Calder and Bean 1958.

⁶⁹ Drew-Bear 2000.

attested from the Phrygian period. Nevertheless, Drew-Bear⁷⁰ states that a great majority of these names must have been indigenous and belonged to the local communities who had existed there long before the arrival of the Greeks. He also stresses that the roads are largely based on the maps of Tabula Imperii Byzantini (TIB) Phrygien⁷¹ and unpublished work by D.H. French who assisted him with the marking.⁷²

3.3.4 Geological Map

A digital geological map of Eskişehir province was provided by Prof. Dr. Can Ayday from Eskişehir Anadolu University who has carried out numerous geological studies in Eskişehir and in the surrounding region since 1990s. Later a new geological map was produced by extending the areas covered on this map. These extensions were digitised from the 1:500.000 scale geological map of Turkey published by MTA (the General Directorate of Mineral Research and Exploration).⁷³ Lastly, the given geological classes on the resulting map were dissolved into new rock categories by using ArcMap/Data Management/Generalization/Dissolve tool.

3.4 Data Limitations and Various Solutions

As mentioned earlier in the text, instead of a monument-based analysis, the cult monuments that belong to the same cultic complex will be considered as one site for practical purposes. This is mainly due to lack of point data for each of these monuments. The second reason is that these monuments are usually no more than a few meters away from each other. Thus, grouping them as one site would not affect

⁷⁰ Drew-Bear 2000: 957.

⁷¹ Belke and Mersich 1990.

⁷² Drew-Bear 2000: 958.

⁷³ Available at: www.mta.gov.tr. Unfortunately, the geology map used in the thesis was the one with the best available resolution for this region.

the general course of the analysis. In order to prevent any misinterpretation, a separate column was dedicated to the monument counts associated for such sites in the spatial database. The cultic sites will be represented with graduated symbols on the resulting maps so that the monument quantities can be visualized.

In the geospatial database (See Appendices) there are some empty data fields particularly related to site size which resulted from the total absence of information about site dimensions in publications. This is also the main reason why any rank-analysis based on site size cannot be conducted at present. Furthermore, the thesis had to exclude the site data collected after 2005 since they have not been published yet. This can be considered as a major limitation to our general understanding of the distribution of the Phrygian sites and settlements in the region.

3.5 Data Analysis and Results

In the following section a total number of 30 cultic sites, 35 settlements, and 28 hilltop sites dated to the Phrygian Period will be analysed using a range of GIS functionalities. In the first part of the analysis, site distributions will be explored quantitatively in relation to each other. In the second part, relationships between topography and cultic site locations will be examined. In the third part an analysis of site locations per geology type will be carried out. The last part will be dedicated to the proximity analysis of cultic site locations to settlements and hilltop sites. Distance to ancient roads will also be discussed as part of the proximity analysis.

3.5.1 Cultic Site Location Patterns

As seen on the map below (Figure 3.1), the cultic sites are concentrated around the certain parts of the landscape. In order to see whether there is any clustering or randomness as to their locations across the landscape, a point pattern analysis was conducted by using Nearest Neighbour Analysis, also known as Clark and Evans

Nearest Neighbour Statistic.⁷⁴ Nearest Neighbour Analysis has been a widely used technique by archaeologists particularly in settlement pattern analysis since 1970s.⁷⁵ It is still an important quantitative method used to analyse, interpret and explain spatial patterns within point type of datasets such as locations of artefacts, features and sites.

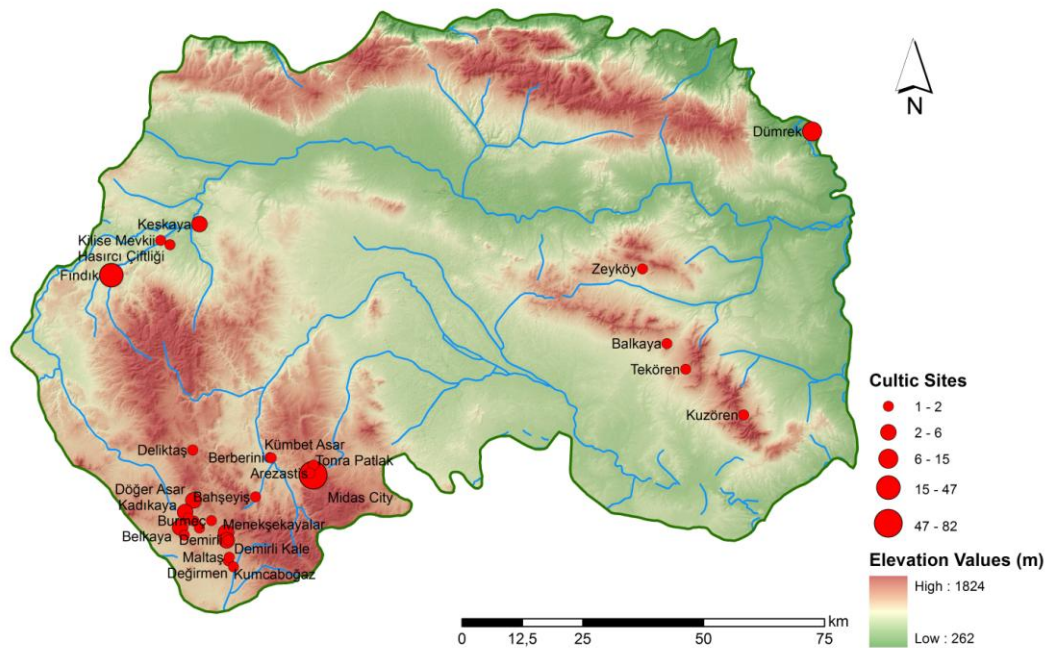


Figure 3.1 Cultic Site Distributions

The site locations were analysed using the Nearest Neighbour Index tool⁷⁶ in ArcGIS. This algorithm finds the distance between each point and its closest

⁷⁴ See Clark and Evans 1954.

⁷⁵ Conolly and Lake 2006: 162.

⁷⁶ NN Analysis is an ArcScript written by Dr. Sawada in 2002 which performs a basic Nearest Neighbour Analysis and gives summary statistics of point distributions available at <http://arcsripts.esri.com/details.asp?dbid=12227>.

neighbour, and then calculates the mean of these distances. As a result, it produces an R-value by dividing the mean of the observed distance between each point and its nearest neighbour R_o by an expected value of R if the distribution was random (R_e) with the following equation:⁷⁷

$$R = R_o / R_e \quad (3.1)$$

An R-value less than 1 indicates a clustered distribution whereas an R-value greater than 1 indicates that the points are more regularly distributed. If the observed mean distance is equivalent to the expected one, this means the distribution is random.

According to the results shown in the Table 3.1 below an R-value equal to **0.4** was obtained which is less than 1 indicating a significantly clustered pattern within the site locations.

Table 3.1 The results of the Nearest Neighbour Analysis

Variable	Corrected	Uncorrected
NN Index	0,4	0,4
Avg. Distance	5265,64	5265,64
Exp. avg. dist.	12477,26	11271,39
SD	1326,72	1075,69

Point patterns are usually described as random, clustered or regular. According to the results of our NN analysis, the cultic sites have a clustered pattern across the study area. Nearly 70% of them forms a cluster in the southwest section where the Highland region lies. There is one cluster of sites in the west near *Fındık Valley* as well. The only isolated site is in the northeast which is *Dümrek*.

⁷⁷ Conolly and Lake 2006: 165.

Any type of clustering or regular patterning may stem from a number of factors such as access to resources and road networks, the presence of regional centres, or less-obvious social variables that are not detectable in the record at a first glance. The clustering in the Highland region to the southwest (Figure 3.1) could be related to the presence of *Midas City*, which lends support to the idea that it is a regional cult centre. The clustering near Fındık Valley could be associated with the presence of *Fındık Asar Kaya*, probably another major cult centre. With the current evidence, however, it is more difficult to comment on the monument groups in the southeast unless we take Pessinus into account. Similarly, *Dümrek* which has no known associations in its vicinity is also intriguing. Nevertheless, it seems highly likely that the site itself could have been a regional cult centre since there are at least 15 cult monuments within the site context.

3.5.2 Cultic Sites and Topography

A topographical analysis of the Phrygian cult monuments in relation to their immediate environments has been done by previous researchers who concluded that the majority of the monuments, with few exceptions, have enough space in their surroundings for large gatherings and public activities although they do not have an easy access from the immediate terrain.⁷⁸ In this study, we will also analyse the relationships between the cultic site locations and topography at a broader scale in a comparative manner with the larger landscape. For this purpose, an elevation analysis was carried out on the DEM below (Figure 3.2). Later, a slope analysis was also run based on the same elevation model (Figure 3.5).

The results showed that the elevations of the cultic sites vary between 673 m and 1367 m with *Dümrek*, the lowest, and *Midas City*, the highest (See Appendix B). As seen in the bar graph below (Figure 3.3), nearly 80% of the cultic sites are located on areas above 1100 m whereas there are only 7 sites below this level.

⁷⁸ Berndt-Ersöz 2006: 157.

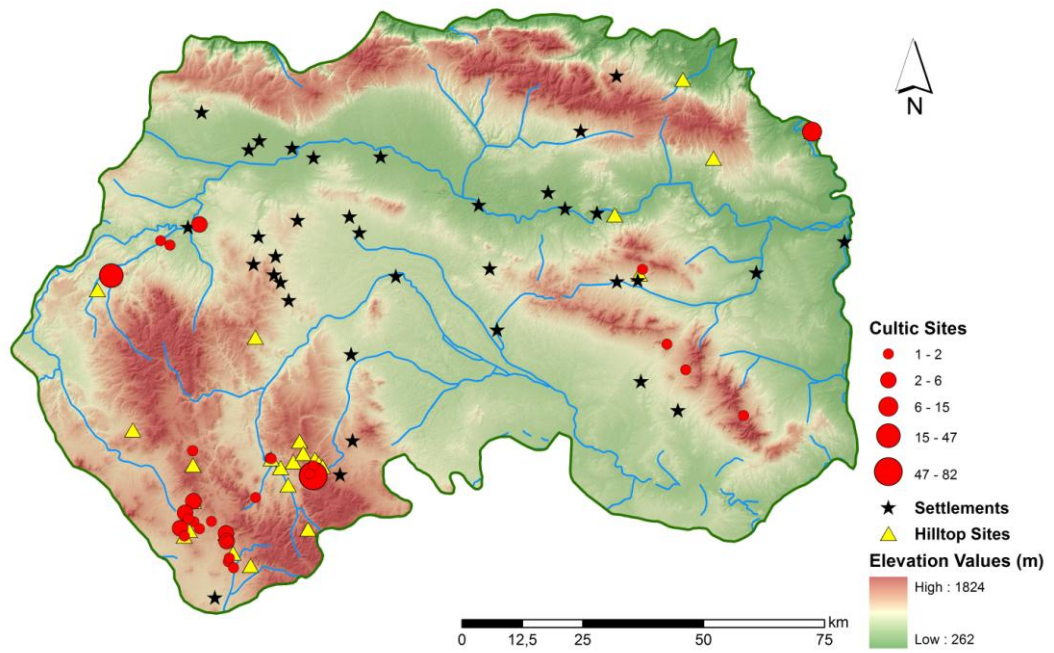


Figure 3.2 The Digital Elevation Model (DEM) showing the point distributions and elevation values

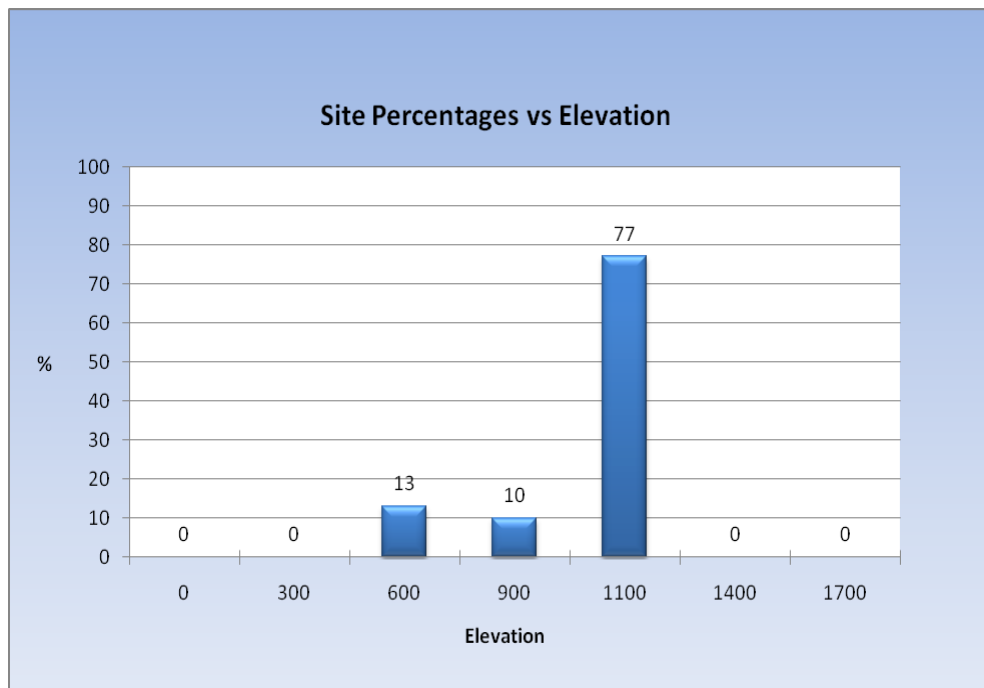


Figure 3.3 Cultic site percentages per elevation category

If this is compared to the elevations of the known Phrygian settlements whose majority is located in areas lower than 1100 m as shown in the bar graph below (Figure 3.4), it could be suggested that the majority of cultic sites are located within zones of higher elevation rather than lower alluvial plains.

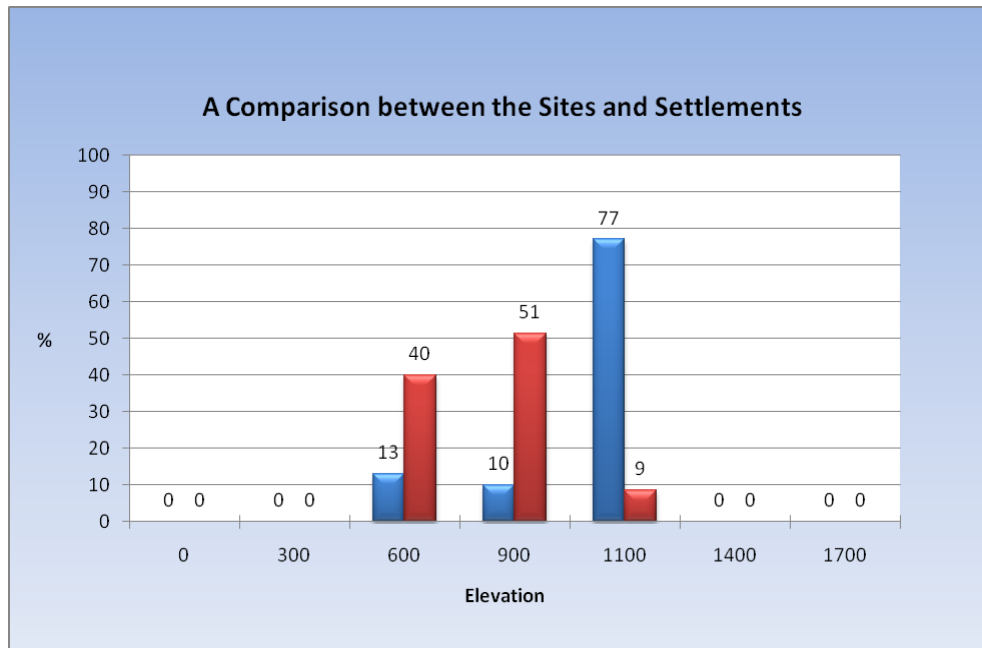


Figure 3.4 A comparison of the elevations of the cultic sites and settlements

The slope analysis also further showed that all cultic sites are concentrated on areas with varying slope degrees where elevations change abruptly (Figure 3.5). This also indicates that the Phrygians chose more rugged parts of the landscape with fluctuant slope degrees for their cultic site locations instead of flat and open areas. In fact, the areas where the cultic sites are aggregated are the higher and less accessible parts of the landscape compared to lower flat plains with gentle slope degrees where major Phrygian settlements are located near water sources.

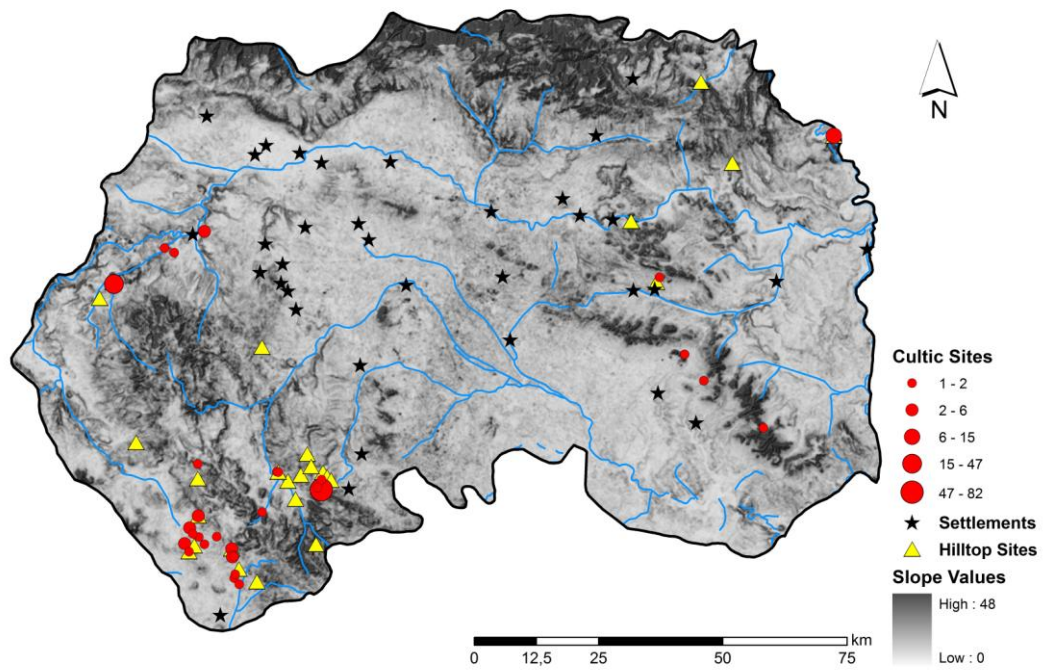


Figure 3.5 The slope map showing the slope values and point distributions

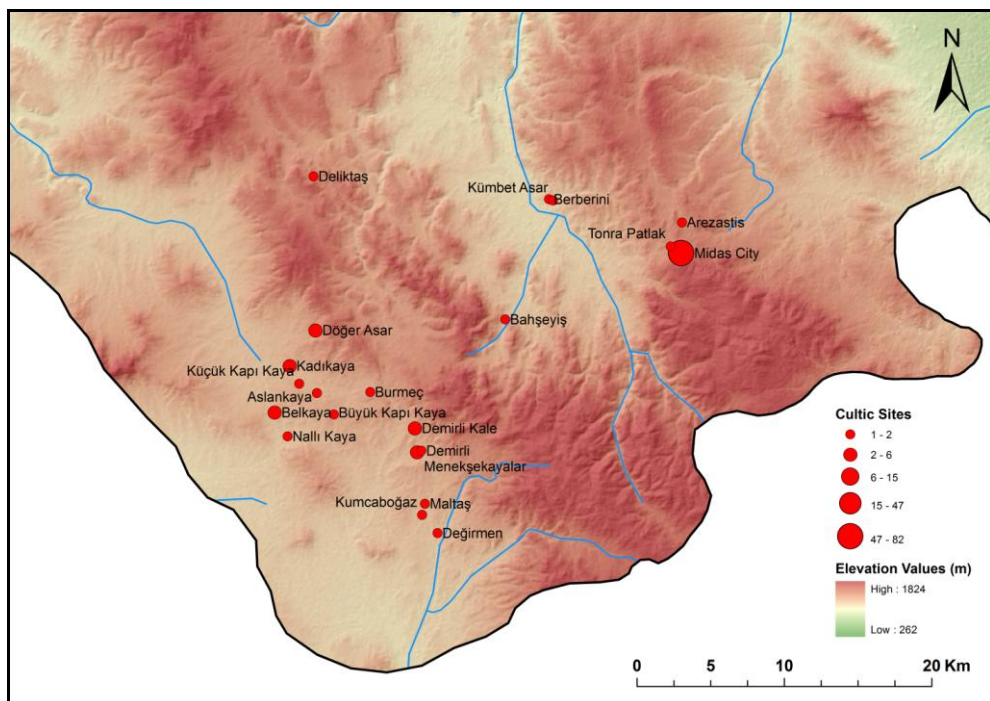


Figure 3.6 A detailed relief map showing the cultic site locations in the southwest section

As a result, the topographical analysis showed that most cultic sites are located either on the edges or within highland regions with higher elevation values such as the Findık Valley to the west, the Highlands of Phrygia to the southwest, and the Sivrihisar mountain range to the southeast (Figure 3.2). At a closer scale, on the other hand, most of the cultic sites are either located on ridges and/or near valley edges at a certain height above the ground (Figure 3.6 and 3.7).

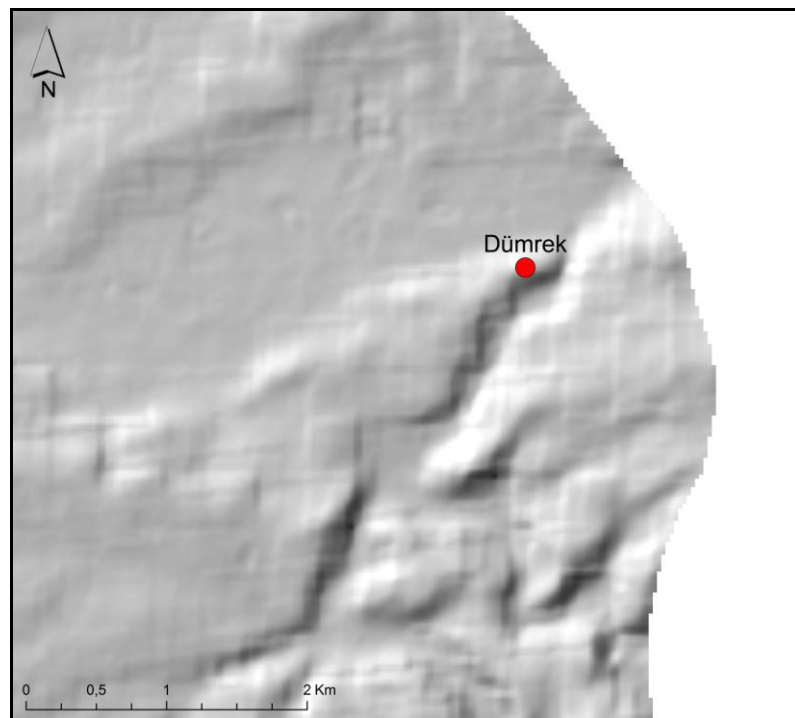


Figure 3.7 Dümrek at a closer scale on the hillshade map

The only sites that are located in lower altitudes include the site clusters around *Findık* and *Keskaya* in the west as well as *Dümrek* in the northeast. However, when the local environments of these sites are examined closely on the slope and relief maps it can be seen that they are located at places with varying slope degrees higher than their immediate terrain (Figure 3.5 and 3.7). This suggests that slope⁷⁹ could

⁷⁹ Slope is “the maximum rate of change of the elevation at a given location” (Conolly and Lake 2006: 190).

have been a more important factor than absolute elevation. Therefore, it could be argued that the cultic sites are located where there is a significant contrast over the landscape due to local topographical variations on the terrain.

3.5.3 Cultic Sites and Geology

The first geological investigations of the areas associated with the Phrygian cultic sites were carried out by Ernest Chaput⁸⁰ whose work was specific to the Highlands of Phrygia to the southwest. His studies revealed that most Phrygian cult monuments were located in zones of volcanic tuff. Later, however, as new monuments were discovered it was realised that other types of rock, e.g. granite, were also used for monument carving. The cult monuments at Balkaya, Dümrek, Kuzören⁸¹ and Tekören are very nice examples of such granite monuments whereas the idol at Kerkenes is of limestone.⁸²

In the reclassified digital geology map below (Figure 3.8) it can be clearly seen that in the west and southwest sections where the cultic sites are found in high concentrations the bedrock is generally composed of limestone and volcanic formations such as soft and/or hard andesitic tuff, agglomerate and basalt. The valleys of Fındık, Karababa, Köhnüş, Kümbet, and Yazılıkaya are very typical examples of such volcanic formations. In the north, east and southeast, however, the case is different. While the major part of the visible landscape here is represented by Quaternary alluvial as well as other types of sedimentary deposits stretching across the Porsuk and Sakarya river basins, no volcanic type is observed. Instead, marble and other metamorphic rock types are found in considerable proportions. Furthermore, the rock type where the cultic sites are located to the northeast and southeast is granite.

⁸⁰ Chaput 1941.

⁸¹ Tüfekçi Sivas 2003: 191.

⁸² Summers and Summers 2003: 63.

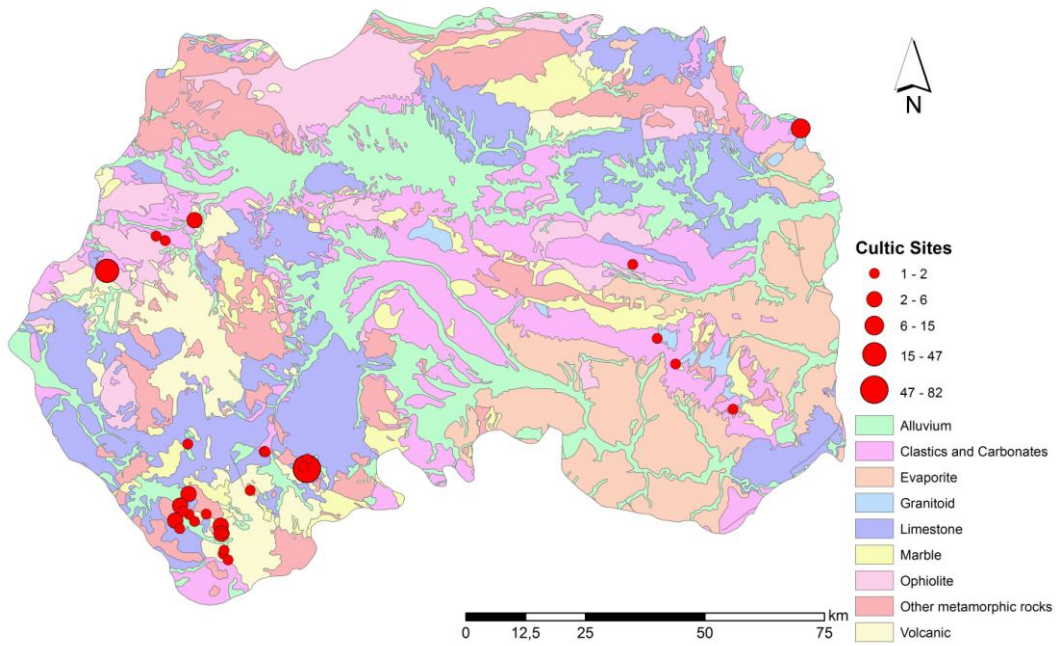


Figure 3.8 The geological map showing different rock classes and cultic site locations

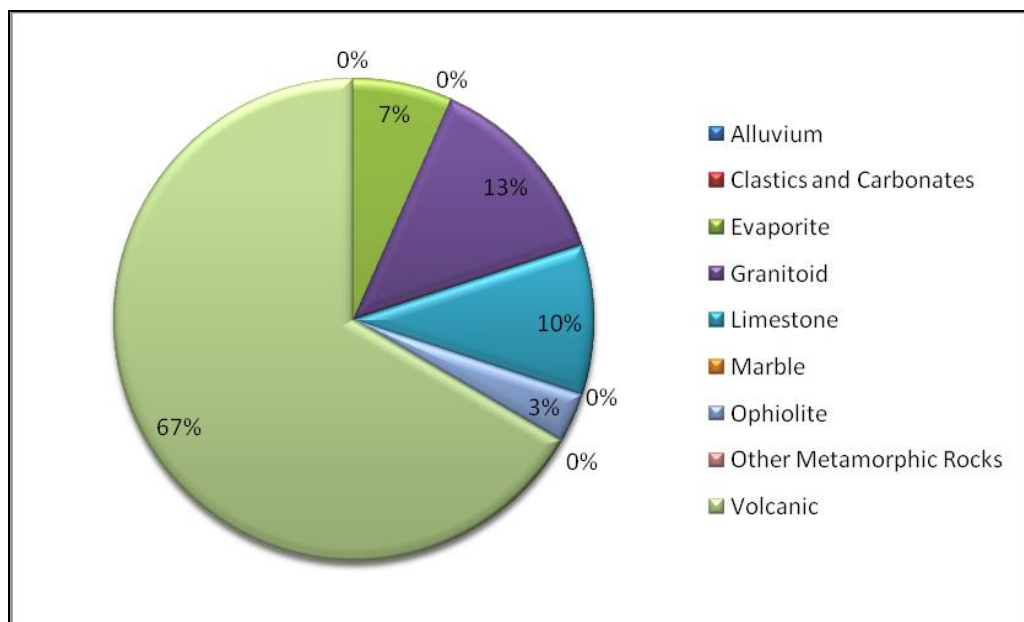


Figure 3.9 The percentages of cultic site occurrence per rock class

The pie chart above (Figure 3.9) shows the percentages of cultic sites per geology type. According to the chart, 67% of the cultic sites are located within volcanic zones whereas 13% is associated with granite. The majority of the rest is found in limestone while a few occur within other zones. As a result, the analysis showed that cultic site locations are not specific to volcanic landscapes although there is a significant relationship between them.

3.5.4 Cultic Sites in relation to Settlements, Hilltop Sites and Ancient Roads

In the related publications spatial relationships between Phrygian cultic sites and höyük-type as well as urban settlements were passed over with only a few words. In most cases they were simply associated with the nearest habitation areas such as hilltop sites. This resulted mainly from the lack of settlement evidence in the region. In addition to this, it was hastily argued that they were located along important roads.⁸³ These suggestions, however, did neither consider the real geographical distances nor the whole regional context.

Fortunately, recent regional surveys have provided us with some settlement evidence, which now contributes to our understanding of their distributions to a certain degree. Therefore, in this section spatial relationships between the cultic sites and urban and/or höyük-type settlements will be analysed by proximity analysis.⁸⁴ Later the proximity to hilltop sites will be examined. This will be followed by an analysis of proximity to ancient roads passing through the study area. In the end proximity analysis will allow us to see to what extent the Phrygian cultic sites might have been spatially related to settlements, hilltop sites and road networks in the light of new evidence.

⁸³ Haspels 1971.

⁸⁴ Proximity analysis is another core component of GIS analysis which measures distances between two locations or features such as points, lines and polygons. However, it does not include topographical factors such as slope and aspect in the calculations.

3.5.4.1 Proximity to Settlements

The proximity to the known Phrygian höyük and/or urban settlements was analysed in three stages. In the first stage the distances between the cultic sites and settlements were measured without defining a search radius. Table 3.2 below shows the results of the first analysis. In the table the first column contains the cultic site names. The third and fourth columns show the nearest settlement names and related distances in kilometres respectively. According to the results of the first analysis, the minimum nearest distance between the cultic sites and settlements is **2.40 km** whereas the maximum nearest distance is **30.62 km**. The mean of nearest distance to settlements is **12.67 km** (Table 3.2).

In the second analysis the search radius was reduced to 15 km whose results are shown in Table 3.3 below. The second analysis showed that there are only **20 cultic sites** which have at least one settlement within 15 km distance whereas the rest **10 cultic sites** do not have any settlement within 15 km distance.

In the third stage the search radius was reduced to 5 km, and the results shown Table 3.4 were obtained. According to the results, there are only **2 cultic sites** that have a settlement within 5 km distance whereas the rest **28 cultic sites** do not have any settlements within 5 km distance.

As a result of the proximity analysis between the cultic sites and settlements, it was understood that there are no cultic sites within any settlement context within the boundaries of the study area. The fact that there are only **2 cultic sites** that have a settlement within a 5 km search radius, which requires several hours of walk, suggests no direct association between the cultic site locations and known höyük-type or urban settlements in the region (Figure 3.10). Among the settlements, *Ablak Höyük*, *Karaağaçpınar* and *Gökçekısıık* occur more frequently in association with the cultic sites.

Table 3.2 The nearest settlements to each cultic site

cultic_site_name	province_name	nearest_settlement	distance (km)
Aslankaya Facade	Afyon	Ablak Höyük	16,20
Belkaya Complex	Afyon	Ablak Höyük	16,01
Burmeç Facade	Afyon	Ablak Höyük	15,70
Büyük Kapı Kaya	Afyon	Ablak Höyük	14,52
Değirmen Facade	Afyon	Ablak Höyük	7,23
Demirli Facade	Afyon	Ablak Höyük	12,03
Demirli Kale	Afyon	Ablak Höyük	13,43
Döğer Asar Kaya	Afyon	Ablak Höyük	20,35
Kadıkaya Complex	Afyon	Ablak Höyük	18,51
Kumcaboğaz Kapı Kaya	Afyon	Ablak Höyük	7,88
Küçük Kapı Kaya	Afyon	Ablak Höyük	17,16
Maltaş Facade	Afyon	Ablak Höyük	8,66
Menekşekayalar	Afyon	Ablak Höyük	11,86
Nallı Kaya	Afyon	Ablak Höyük	14,17
Deliktaş Niche	Kütahya	Ablak Höyük	30,62
Arezastis Facade	Eskişehir	Karaağaçpınar	5,78
Bahşeyiş Facade	Eskişehir	Karaağaçpınar	18,11
Berberini Facade	Eskişehir	Karaağaçpınar	14,89
Kümbet Asar Kale	Eskişehir	Karaağaçpınar	14,61
Midas City	Eskişehir	Karaağaçpınar	5,57
Tonra Patlak Facade	Eskişehir	Karaağaçpınar	6,27
Hasırcı Çiftliği	Eskişehir	Gökçekısık	5,29
Keskaya Complex	Eskişehir	Gökçekısık	2,40
Kilise Mevkii	Eskişehir	Gökçekısık	6,33
Fındık Complex	Kütahya	Gökçekısık	18,81
Dümrek Complex	Eskişehir	Gordion	23,61
Balkaya Facade	Eskişehir	Büyük Höyük I	9,36
Kuzören Facade	Eskişehir	Pessinus	13,63
Tekören Altar	Eskişehir	Pessinus	8,51
Zeyköy Altars	Eskişehir	Tepecik Höyük	2,47

Table 3.3 The nearest settlements within a 15 km search radius

cultic_site_name	province_name	nearest_settlements	distance (km)
Büyük Kapı Kaya	Afyon	Ablak Höyük	14,52
Değirmen Facade	Afyon	Ablak Höyük	7,23
Demirli Facade	Afyon	Ablak Höyük	12,03
Demirli Kale	Afyon	Ablak Höyük	13,43
Kumcaboğaz Kapı Kaya	Afyon	Ablak Höyük	7,88
Maltaş Facade	Afyon	Ablak Höyük	8,66
Menekşekayalar	Afyon	Ablak Höyük	11,86
Nallı Kaya	Afyon	Ablak Höyük	14,17
Arezastis Facade	Eskişehir	Karaağaçpınar	5,78
Arezastis Facade	Eskişehir	Hankaraağaç	9,63
Berberini Facade	Eskişehir	Karaağaçpınar	14,89
Kümbet Asar Kale	Eskişehir	Karaağaçpınar	14,61
Midas City Complex	Eskişehir	Karaağaçpınar	5,57
Midas City Complex	Eskişehir	Hankaraağaç	10,95
Tonra Patlak Facade	Eskişehir	Karaağaçpınar	6,27
Tonra Patlak Facade	Eskişehir	Hankaraağaç	11,19
Berberini Facade	Eskişehir	Karaağaçpınar	14,89
Hasırcı Çiftliği	Eskişehir	Gökçekısık	5,29
Keskaya Complex	Eskişehir	Karapazar	13,85
Keskaya Complex	Eskişehir	Gökçekısık	2,40
Keskaya Complex	Eskişehir	Derbent	12,46
Kuzören Facade	Eskişehir	Pessinus	13,63
Balkaya Facade	Eskişehir	Pessinus	13,84
Balkaya Facade	Eskişehir	Büyük Höyük I	9,36
Balkaya Facade	Eskişehir	Tepecik Höyük	14,47
Tekören Altar	Eskişehir	Pessinus	8,51
Tekören Altar	Eskişehir	Büyük Höyük I	9,55
Zeyköy Altars	Eskişehir	İbikseydi Höyüğü	5,81
Zeyköy Altars	Eskişehir	Tepecik Höyük	2,47
Zeyköy Altars	Eskişehir	Yalınlı Höyük	14,95

Table 3.4 The nearest settlements within a 5 km search radius

cultic_site_name	province_name	nearest_settlements	distance (km)
Keskaya Complex	Eskişehir	Gökçekısık	2,40
Zeyköy Altars	Eskişehir	Tepecik Höyük	2,47

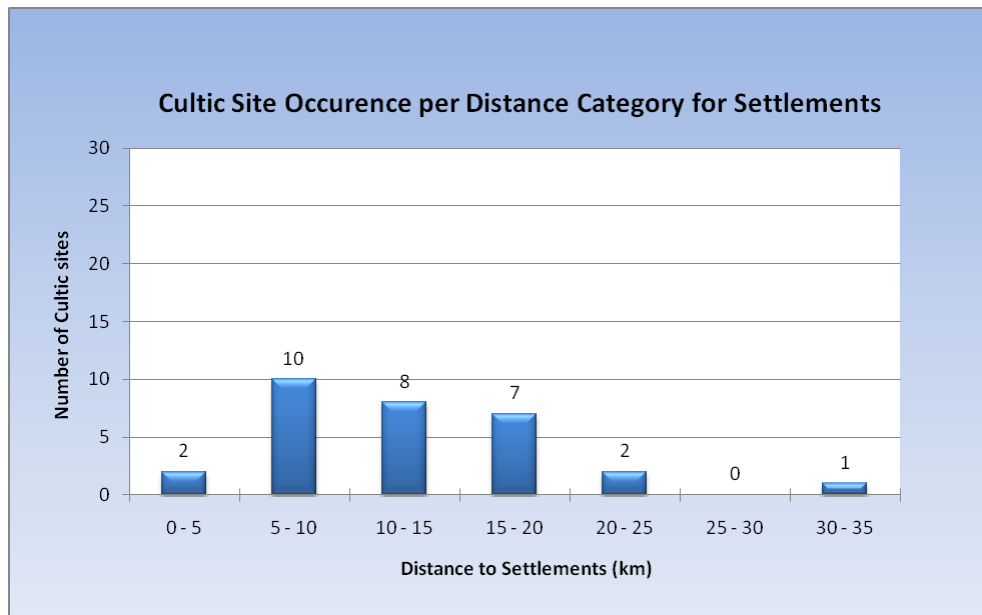


Figure 3.10 The histogram showing the frequencies of cultic sites within specified distances to the nearest settlements

3.5.4.2 Proximity to Hilltop Sites

The table below (Table 3.5) shows the results of the proximity analysis between the cultic sites and hilltop sites. The first column includes the cultic site names whereas the third and fourth columns contain the nearest hilltop site names and related distances in kilometres respectively.

According to the results of this analysis, the minimum nearest distance between cultic sites and hilltop sites is **0 km** while the maximum nearest distance is **36.27 km**. The mean nearest distance to hilltop sites is **5.32 km**.

In the table below (Table 3.5) **6 out of 30 cultic sites** with varying number of cult monuments, namely *Demirli Kale*, *Döğler Asar Kaya*, *Dümrek Complex*, *Kümbet Asar Kale*, *Midas City Complex*, and *Nallı Kaya* are located within hilltop sites so each of these sites is directly associated with the site itself.

Table 3.5 The nearest hilltop sites to each cultic site

cultic_site_name	province_name	nearest_hilltop_site	distance (km)
Burmeç Facade	Afyon	Demirli Kale	3,89
Demirli Facade	Afyon	Demirli Kale	1,58
Demirli Kale	Afyon	Demirli Kale	0,00
Menekşekayalar	Afyon	Demirli Kale	1,62
Döğer Asar Kaya	Afyon	Döğer Asar Kaya	0,00
Kadıkaya Sanctuary	Afyon	Döğer Asar Kaya	2,97
Değirmen Facade	Afyon	Köhnüş Kale	3,04
Kumcaboğaz Kapı Kaya	Afyon	Köhnüş Kale	2,04
Maltaş Facade	Afyon	Köhnüş Kale	1,30
Belkaya Complex	Afyon	Nallı Kaya	1,84
Nallı Kaya	Afyon	Nallı Kaya	0,00
Aslankaya Facade	Afyon	Üçler Kaya	2,01
Büyük Kapı Kaya	Afyon	Üçler Kaya	2,11
Küçük Kapı Kaya	Afyon	Üçler Kaya	2,42
Dümrek Complex	Eskişehir	Dümrek/Kalebaşı	0,00
Hasırcı Çiftliği	Eskişehir	Fındık Asar Kaya	13,64
Keskaya Complex	Eskişehir	Fındık Asar Kaya	21,01
Kilise Mevkii	Eskişehir	Fındık Asar Kaya	12,42
Berberini Facade	Eskişehir	Kümbet Asar Kale	0,28
Kümbet Asar Kale	Eskişehir	Kümbet Asar Kale	0,00
Midas City	Eskişehir	Midas Şehri	0,00
Tonra Patlak Facade	Eskişehir	Midas Şehri	0,84
Arezastis Facade	Eskişehir	Pişmiş Kale	1,21
Bahşeyiş Facade	Eskişehir	Yapıldak Asar Kaya	7,23
Balkaya Facade	Eskişehir	Zey Kale	15,52
Kuzören Facade	Eskişehir	Zey Kale	36,27
Tekören Altar	Eskişehir	Zey Kale	21,93
Zeyköy Altars	Eskişehir	Zey Kale	1,15
Deliktaş Kale	Kütahya	Deliktaş Kale	2,94
Fındık Complex	Kütahya	Fındık Asar Kaya	0,36

As shown in the histogram below (Figure 3.11), **23 cultic sites** are located within less than 5 km distance from a hilltop site. The rest of the **7 cultic sites** are within between 5 and 36 km distance from the nearest hilltop site.

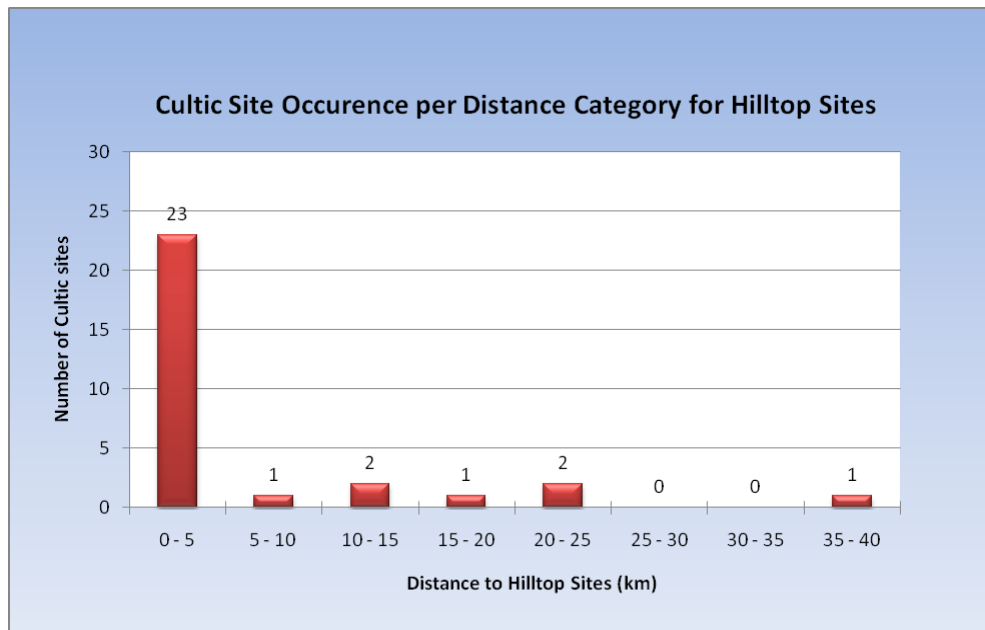


Figure 3.11 The histogram showing the frequencies of cultic sites within specified distances to the nearest hilltop sites

3.5.4.3 A Comparison between the Two Proximity Analyses

Table 3.6 A comparison of the distances to the nearest settlements and hilltop sites

	Minimum Nearest Distance (km)	Maximum Nearest Distance (km)	Mean (km)	SD
Distance to Settlements	2,40	30,62	12,67	6,46
Distance to Hilltop Sites	0,00	36,27	5,32	8,5

The proximity analysis showed that the nearest distances to settlements range from **2.40** to **30.62 km** with a mean distance of **12.67 km**. The nearest distances to hilltop sites, on the other hand, range from **0** to **36.27 km** with a mean distance of **5.32 km**. When the results of the two proximity analyses are compared, it was observed that

the cultic sites are more closely located to hilltop sites than to höyük-type and urban settlements (Table 3.6). Therefore, it could be suggested that the cultic sites are more associated with the hilltop sites than with the settlements (Figure 3.12).

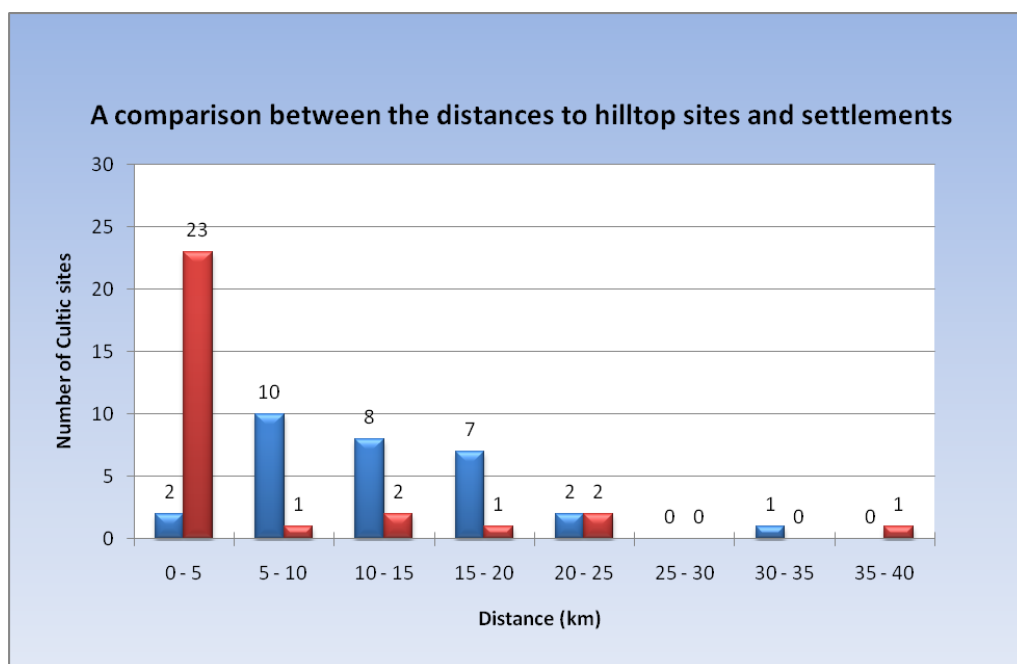


Figure 3.12 The histogram comparing the two proximity results

3.5.4.4 Cultic Sites and Major Ancient Roads

A proximity analysis between the cultic site locations and major ancient roads (Figure 3.13) was also carried out in order to see whether there was any association between them. Before this, however, it should be noted that this analysis relies entirely on the assumption that a great extent of the ancient major road network covered in this study follows existing earlier road networks only with minor deviations.⁸⁵ Therefore, these roads were probably already in use in the Phrygian period and even earlier.

⁸⁵ Drew-Bear 2000: 958.

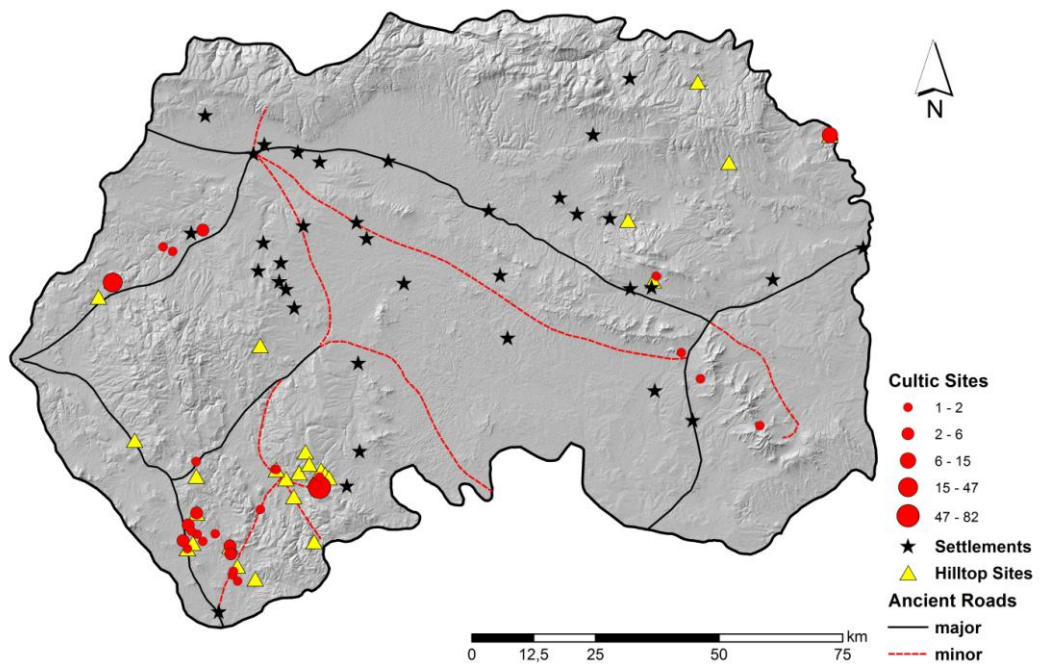


Figure 3.13 The known ancient major and minor routes within the study area

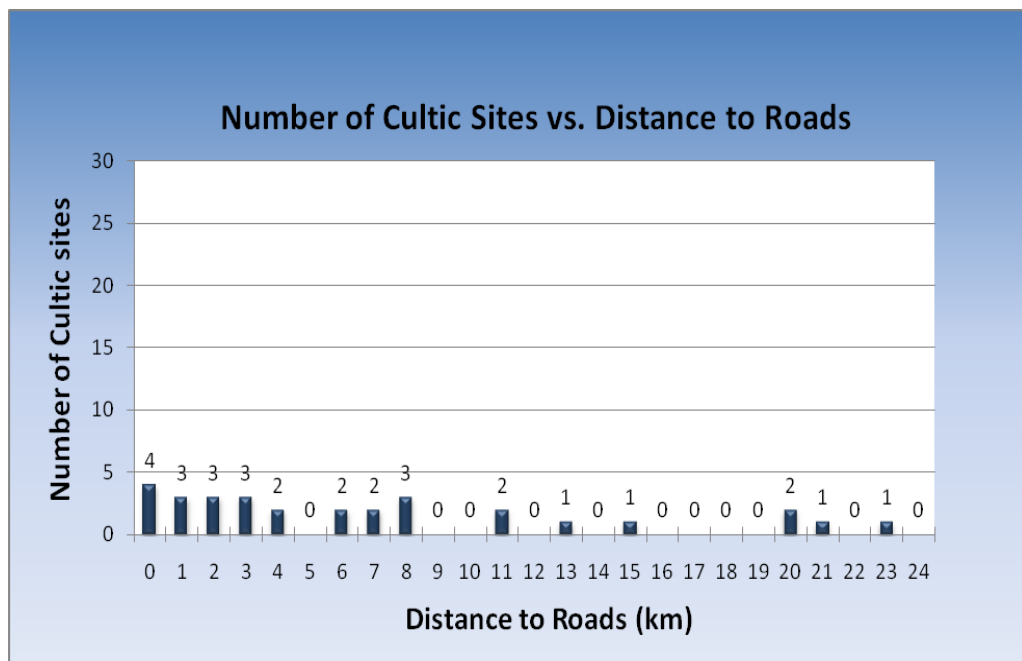


Figure 3.14 The histogram showing the frequencies of cultic sites within specified distances from the nearest ancient road

The frequency histogram above (Figure 3.14) shows the number of cultic sites that falls within every 1 km distance from a major road. According to the histogram, the majority of the cultic sites are within 8 km distance to the nearest ancient major road. The minimum distance is **0.02 km** whereas the maximum distance is **23.54 km**. The mean of the nearest distances is **7.43 km**.

Later a detailed buffer analysis was carried out in order to detect how many cultic sites are located within 500 m, 1 km, and 2 km distances from a major ancient road. For this analysis, three separate buffer zones were created along the major road network as shown respectively on the maps Figure 3.15, 3.16 and 3.17 below. According to the analysis, **2 out of 30 cultic sites** fall into the 500 m-buffer zone whereas there are **4 cultic sites** that fall into the 1 km-buffer zone. Figure 35 shows that **7 out of 30 cultic sites** fall into the 2 km-buffer zone. This means **23 cultic sites** are out of the zone.

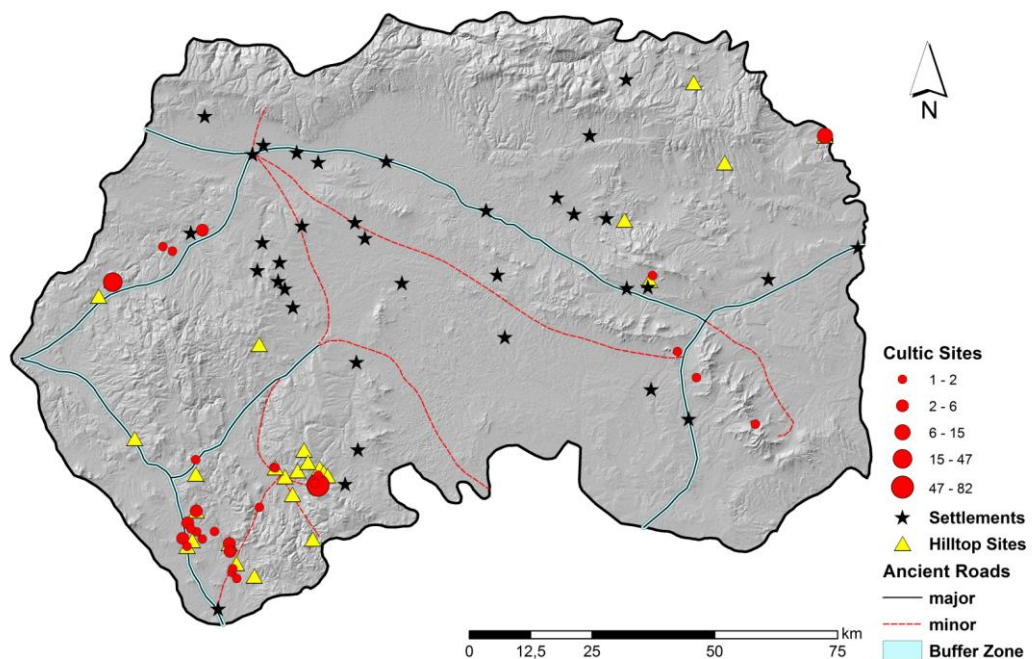


Figure 3.15 The map with the 500 m-buffer zone along the major roads

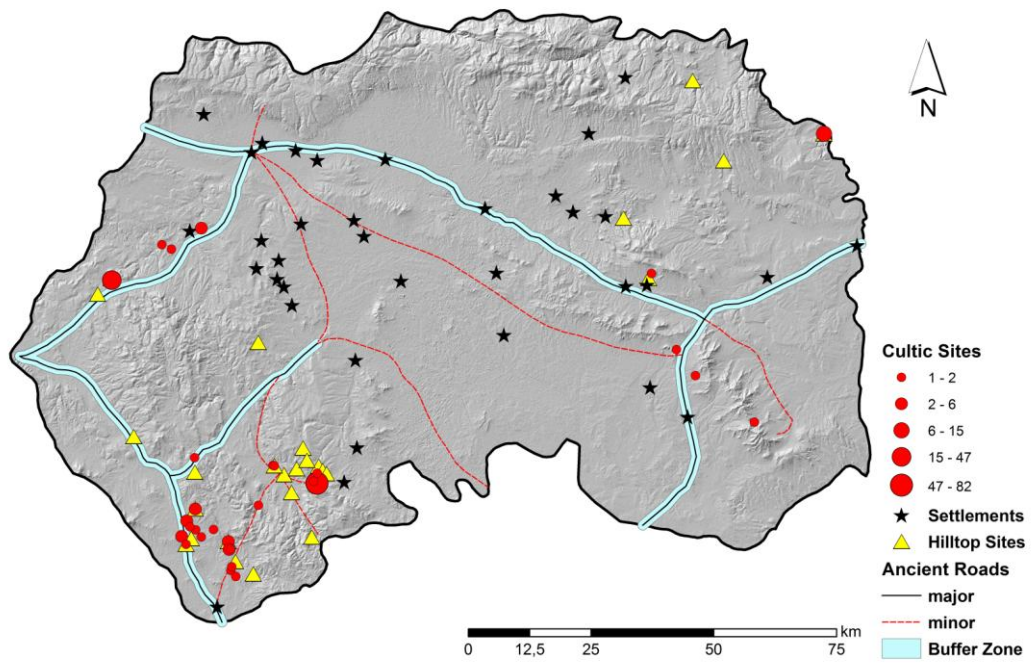


Figure 3.16 The map with the 1 km-buffer zone along the major roads

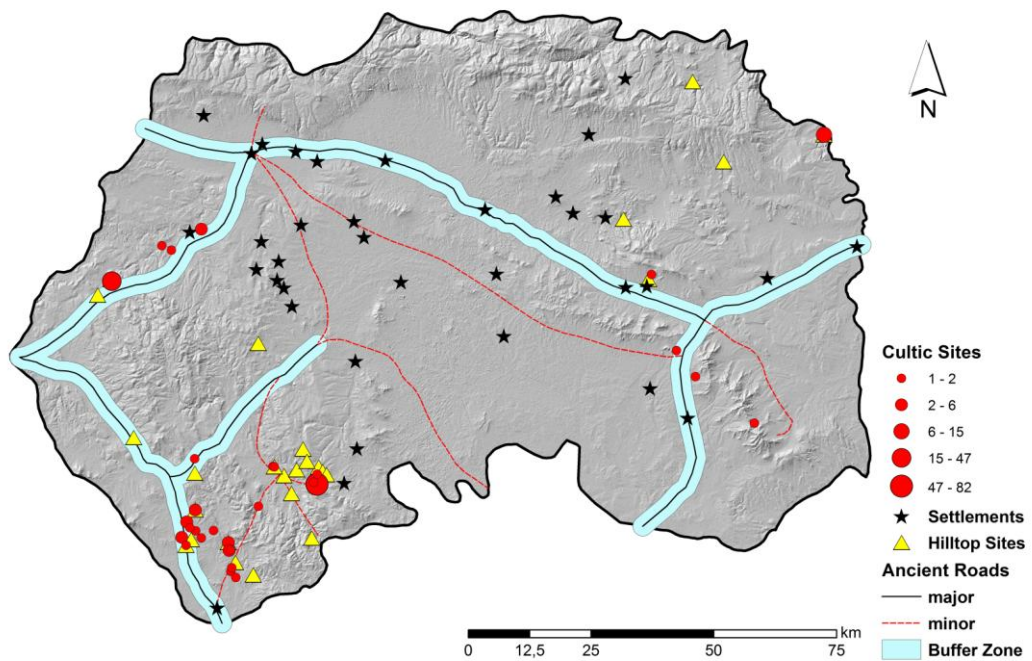


Figure 3.17 The map with the 2 km-buffer zone along the major roads

As a result, only *Nallı Kaya* and *Deliktaş Kale* seem to have been located within a walk distance (500 m) from a major ancient road (Figure 3.18). Most of the cultic sites, however, did not have a direct access to the road network. Interestingly enough, none of the architectural facades that are visible from some distance are associated with these major roads. Therefore, it is difficult to suggest a direct association between the major, frequently used roads and cultic site locations. This may suggest that they were not easily accessible. However, this does not rule out the possible existence of other routes unknown to us. This also further suggests that different routes could have been used in the Phrygian period. The red lines on the map below represent the ancient minor routes also digitised from *the Barrington Atlas*. The site groups in the highland region in the southwest were probably connected to the major road network via these minor routes. In other words, these minor routes shown in red were probably the routes that facilitated access to the cultic sites and hilltop sites.

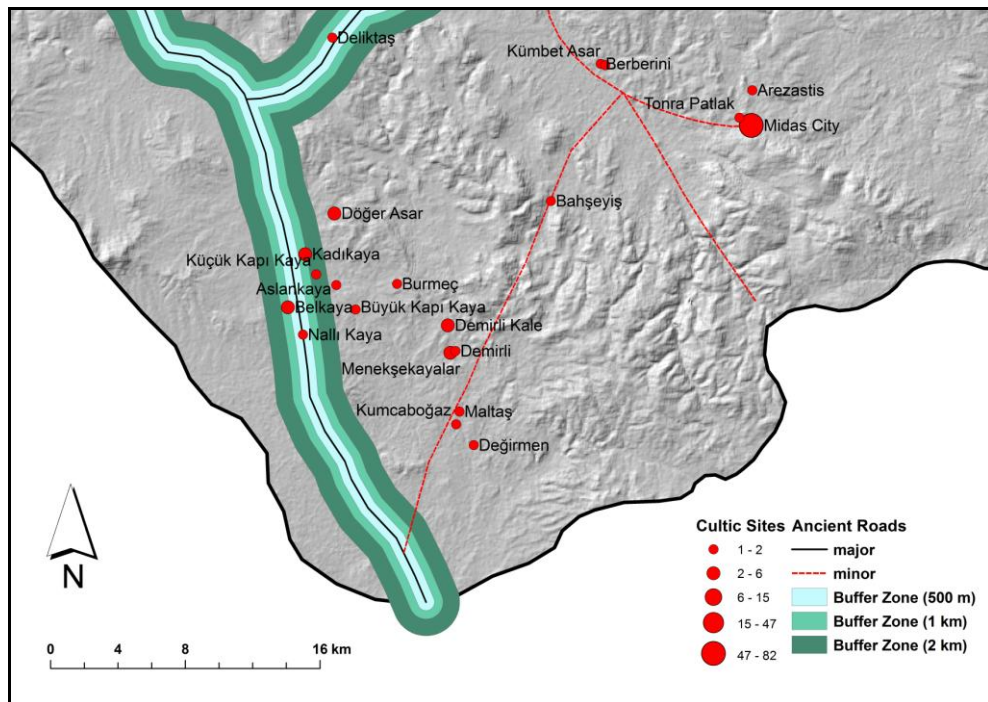


Figure 3.18 *The relationship between the cultic sites and major roads in the southwest section of the study area*

CHAPTER IV

DISCUSSION

4.1 Towards a Cultic Landscape?

In the pattern analysis it was understood that the cultic sites are not randomly distributed over the study area. They are found in clusters in certain areas of the region. The topographical analysis revealed that they are located either on the edges or within the highland zones with lower accessibility. The geological analysis indicated that the majority of the monuments are found in volcanic landscapes. The proximity analysis further showed that they are located outside the flat alluvial settlement geography of West Central Phrygia even in the light of new survey evidence. Moreover, it was realised that a great majority of the cultic sites did not have a straight access to the major ancient road networks.

The frequent occurrence of cultic sites in volcanic zones, of course, is not random. It is obvious that volcanic types of rock were more favoured than others (Figure 3.19). A widely accepted notion among previous researchers is that volcanic rocks, particularly tuff, are easier to cut. This idea may well explain the low density or total absence of cultic sites in most areas where there is not any volcanic type such as the Sündiken range and the Porsuk basin. Nevertheless, the analysis also showed that the cult monuments are not specific to volcanic zones. Where this type of rock was not available, other types, such as granite and limestone, were also used. Therefore, the idea that volcanic rocks were chosen because they are easier to cut is not sufficient by itself to explain the high frequency of cultic site occurrence in volcanic areas. There must be less-obvious cultural reasons for monument construction alongside the practicality of these volcanic rocks.



*Figure 3.19 The geological formations in Fındık Valley
(Photo: Yasemin Özarıslan 2009)*

As a result, what does this evidence suggest in terms of our understanding of the Phrygian cultic sites? Why would people construct their cult centres and spectacular cult monuments in such less-accessible areas from the surrounding landscape? Above all, in this part of the country the climate is rather harsh and the ground is covered with snow for months in winters as expected from a continental climate. Then why would they go and build their cult monuments in such challenging spaces?

We suggest that it could be the landscape itself. These mountainous settings characterized by a series of high mountains divided by deep valleys and rocky hills with flat tops and sheer edges where elevations change abruptly are unusual (Figure 3.20). These landscapes also provide unusual fantastic geological formations (Figure 3.21). As a result, they produce a high contrast with the surrounding flat alluvial settlement geography. As Taçon notes, “certain landscape features invoke common

responses in human beings,”⁸⁶ such as power, respect, beauty, feeling of sacredness, most of which occur particularly upon perceiving four types of places:

- a) where the results of great acts of natural transformation can be best seen, such as mountain ranges, volcanoes, steep valleys or gorges;
- b) at junctions or points of change between geology, hydrology, and vegetation, or some combination of all three, such as sudden changes in elevation, waterfalls, the places where rainforest meets other vegetation;
- c) where there is an unusual landscape feature, such as a prominent peak, cave, or hole in the ground that one comes upon suddenly;
- d) places providing panoramic views or large vistas of interesting and varied landscape features.⁸⁷

Therefore, the contrasts created by these “highlandscapes” were perceived, conceived and responded by the Phrygians. Despite their low accessibility, these unusual landscapes were shaped, monumentalised and converted from natural to social and meaningful places by these people. Into the heart of these fantastic settings they built their most spectacular monuments.

Human response to such unusual landscapes by monument construction is neither new nor specific to the Phrygian Highlands. Similar examples of rock carving are known from other Anatolian cultures including the Hittite, Urartu, Cappadocia, Lycia and Cilicia. There are also many other examples from the world including Africa, Bulgaria, Crete, Britain, and Mesoamerica, as well as Australia. It is a universal human reaction to convert such unusual natural landscapes to sacred places through the construction of monuments for deities and cults.

⁸⁶ Taçon 1999: 36-37.

⁸⁷ Taçon 1999: 37.



*Figure 3.20 A view of the surrounding landscape from Midas City
(Photo: Yasemin Özarıslan 2009)*



*Figure 3.21 A very nice example of tuff rock formation at Midas City
(Photo: Yasemin Özarıslan 2009)*

The cult itself was not new either, as suggested by previous researchers. The Phrygians embedded their own identity and power to this pre-existing cult, and these “highlandscapes” offered the ideal environment for the evolution and permanency of their cult who is known to have a mountainous character. They probably dedicated not only the rocks, but also the whole landscape to their cult as evident from the strong association between the cultic site locations and these unusual zones. Over time strong ties between their cult and these landscapes must have developed.

4.2 Further Questions

The clustering of the cultic sites in the Fındık Valley in the west, the Highlands of Phrygia in the southwest and the Sivrihisar range promote these highland areas as significantly special among the other zones. Nevertheless, when the whole geomorphological context is examined, it is apparent that these areas are not the only highland zones in the region. The Sündiken range in the north is another highland area, for instance. The question is why there are no cultic sites within this zone. Is this because this zone was simply ignored by the Phrygians, or not covered in previous archaeological surveys? Or is it the geology there? This question is difficult to answer for the time being.

The other question is *Dümrek* to the northeast (Figure 3.22). *Dümrek* is the only known cultic site near the Sündiken range. The site has a total of 15 cult monuments, which renders it a readily prominent cultic site. It also falls into a different geological zone which is granite. Besides this, it has no obvious connection with any known settlement and road network. If we assume that *Dümrek* is the earliest cult centre among all the others, as suggested by Berndt-Ersöz very recently,⁸⁸ we could suggest a transfer of cultic sites to the higher zones such as the Highlands to the southwest for an unknown security reason over time. If this is the case, then an explanation can be made for the high frequency of hilltop site occurrence near cultic sites. However,

⁸⁸ Berndt-Ersöz 2009: 17.

with the current state of evidence, it is difficult to understand the dynamics behind *Dümrek*. There may also exist other cultic sites in the region unknown to us which should be a topic of further research. The lack of archaeological investigations on the hilltop sites together with the absence of a chronology also prevents us from making any interpretation at present. Under these circumstances, it is also difficult to answer what they were protecting. One realistic argument would be that they cannot have been inhabited by large populations.



Figure 3.22 Dümrek (Photo: Geoffrey D. Summers 2008)

Evidence from elsewhere proved that cultic monuments might also occur within urban settlement contexts.⁸⁹ Within the boundaries of the study area, however, no such an observation was made. The question is how and when this tradition emerged. Whether this is true for all settlements associated with Phrygian culture is unknown. Hopefully further archaeological research in the region will answer this question.

⁸⁹ Summers *et al.* 2003: 63.

CHAPTER V

CONCLUSION

In this thesis a total of 30 Phrygian cultic sites located in the area between the centre of Kütayha to the west, Polatlı, Ankara to the east, Mihaliççık, Eskişehir to the north, İhsaniye, Afyon to the south were examined through a landscape perspective using a range of GIS analyses. In the analyses, spatial relationships of the cultic sites to each other, to topography, geology, settlements and major ancient routes were explored.

While portraying certain patterns as to the Phrygian cultic site locations, the study also placed particular emphasis on the landscapes which they are part of. Eventually, the study drew attentions to the cognitive dimensions of these landscapes alongside the availability of resources. In this respect, it suggested that the highlandscapes of Western Phrygia and the presence of contrasts caused by the natural features could have played a crucial role on the cultic site locations.

There must be numerous other factors such hydrology, vegetation, the availability of agricultural lands, etc. behind these phenomena that are not covered in this study as well. In fact, this study will never be sufficient alone to understand the complete picture. Nevertheless, this study should be considered as a small step towards an understanding of the cultic landscapes of Phrygia.

With the current state of evidence, it is also difficult to reveal the cognitive and socio-symbolic significance of these landscapes. A long-term multi-period landscape analysis may be needed to complete this puzzle. Therefore, further research should also turn to evidence from other periods since the transformation of these landscapes through monument construction continued until modern times. The answer probably lies within this continuity.

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APPENDICES

APPENDIX A

List of the cultic sites used in the analysis

site id	site name	province	town	village	utm easting	utm northing	UTM zone
1	Aslankaya Facade	Afyon	İhsaniye	Döğer Beldesi	277726	4331627	36N
2	Belkaya Complex	Afyon	İhsaniye	Döğer Beldesi	274860	4330313	36N
3	Burneç Facade	Afyon	İhsaniye	Döğer Beldesi	281337	4331692	36N
4	Büyük Kapı Kaya Facade	Afyon	İhsaniye	Döğer Beldesi	278876	4330177	36N
5	Döğer Asar Kaya	Afyon	İhsaniye	Döğer Beldesi	277622	4335869	36N
6	Kadıkaya Complex	Afyon	İhsaniye	Döğer Beldesi	275883	4333458	36N
7	Küçük Kapı Kaya Facade	Afyon	İhsaniye	Döğer Beldesi	276534	4332256	36N
8	Nallı Kaya	Afyon	İhsaniye	Döğer Beldesi	275747	4328695	36N
9	Demirli Facade	Afyon	İhsaniye	Demirli Köyü	284806	4327725	36N
10	Demirli Kale	Afyon	İhsaniye	Demirli Köyü	284363	4329241	36N
11	Menekşekayalar Complex	Afyon	İhsaniye	Demirli Köyü	284511	4327624	36N
12	Kumcaboğaz Kapı Kaya	Afyon	İhsaniye	Kayihan Beldesi	284850	4323385	36N
13	Maltaş Facade	Afyon	İhsaniye	Kayihan Beldesi	285051	4324141	36N
14	Değirmen Facade	Afyon	İhsaniye	Kayihan Beldesi	285897	4322147	36N
15	Hasırcı Çiftliği Altars	Eskişehir	Merkez	Yeni Sofça Köyü	272767	4388677	36N
16	Kilise Mevkii Facade	Eskişehir	Merkez	Yeni Sofça Köyü	270843	4389599	36N
17	Keskaya	Eskişehir	Merkez	Karaalan Köyü	278866	4392927	36N
18	Berberini Facade	Eskişehir	Seyitgazi	Kümbet Köyü	293441	4344733	36N
19	Kümbet Asar Kale	Eskişehir	Seyitgazi	Kümbet Köyü	293715	4344657	36N
20	Tonra Patlak Facade	Eskişehir	Seyitgazi	Gökçegüney	301685	4341545	36N
21	Arezastis/Areyastis Facade	Eskişehir	Han	Yazılıkaya Köyü	302448	4343168	36N
22	Midas City Complex	Eskişehir	Han	Yazılıkaya	302391	4341085	36N
23	Bahşeyiş Facade	Eskişehir	Han	Gökbahçe	290481	4336603	36N
24	Dümrek Complex	Eskişehir	Mihalıççık	Dümrek Köyü	405592	4412089	36N
25	Kuzören Facade	Eskişehir	Günyüzü	Kuzören Köyü	391443	4353535	36N
26	Tekören Altar	Eskişehir	Günyüzü	Tekören Köyü	379446	4362976	36N
27	Balkaya Facade	Eskişehir	Sivrihisar	Böğürtlen Köyü	375577	4368275	36N
28	Zeyköy Complex	Eskişehir	Sivrihisar	Zeyköy	370496	4383710	36N
29	Deliktaş Kale	Kütahya	Merkez	Ovacık Köyü	277494	4346286	36N
30	Fındık Complex	Kütahya	Merkez	Fındık Köyü	260606	4382384	36N

APPENDIX B

List of the cultic sites used in the analysis

site_id	site_name	mon_counts	mon_type	elevation	nearest_settlement	distance (km)	nearest_hilltop_site	distance (km)	nearest_road (km)
1	Aslankaya Facade	1	Architectural facade	1155	Abiak Höyük	16,20	Üçler Kaya	2,01	2,45
2	Belkaya Complex	6	Monument Cluster	1135	Abiak Höyük	16,01	Nallı Kaya	1,84	0,60
3	Burneç Facade	1	Architectural facade	1181	Abiak Höyük	15,70	Demirli Kale	3,89	6,02
4	Büyük Kapı Kaya Facade	1	Small facade	1158	Abiak Höyük	14,52	Üçler Kaya	2,11	3,35
5	Döğür Asar Kaya	5	Monument Cluster	1222	Abiak Höyük	20,35	Döğür Asar Kaya	0,00	3,13
6	Kadıkaya Complex	4	Monument Cluster	1134	Abiak Höyük	18,51	Döğür Asar Kaya	2,97	0,93
7	Küçük Kapı Kaya Facade	1	Small facade	1132	Abiak Höyük	17,16	Üçler Kaya	2,42	1,37
8	Nallı Kaya	1	Stepped Altar	1112	Abiak Höyük	14,17	Nallı Kaya	0,00	0,02
9	Demirli Facade	1	Small facade	1146	Abiak Höyük	12,03	Demirli Kale	1,58	8,85
10	Demirli Kale	6	Monument Cluster	1199	Abiak Höyük	13,43	Demirli Kale	0,00	8,61
11	Meneşkekayalar Complex	5	Monument Cluster	1138	Abiak Höyük	11,86	Demirli Kale	1,62	8,55
12	Kumcaboğaz Kapı Kaya	2	Monument Cluster	1125	Abiak Höyük	7,88	Köhnüş Kale	2,04	6,97
13	Maltaş Facade	1	Architectural facade	1131	Abiak Höyük	8,66	Köhnüş Kale	1,30	7,43
14	Değirmen Facade	1	Architectural facade	1108	Abiak Höyük	7,23	Köhnüş Kale	3,04	7,13
15	Hasırcı Çiftliği Altars	2	Stepped Altar	888	Gökçekisik	5,29	Fındık Asar Kaya	13,64	2,46
16	Kilise Mevkii Facade	1	Small facade	847	Gökçekisik	6,33	Fındık Asar Kaya	12,42	4,59
17	Keskaya	4	Monument Cluster	866	Gökçekisik	2,40	Fındık Asar Kaya	21,01	1,76
18	Berberini Facade	1	Small facade	1071	Karağaçpınar	14,89	Kümbet Asar Kale	0,28	11,69
19	Kümbet Asar Kale	1	Altar	1084	Karağaçpınar	14,61	Kümbet Asar Kale	0,00	11,97
20	Tonra Patlak Facade	1	Small facade	1270	Karağaçpınar	6,27	Midas City	0,84	20,42
21	Arezastis/Arevasis Facade	1	Architectural facade	1265	Karağaçpınar	5,78	Pişmiş Kale	1,21	20,05
22	Midas City Complex	82	Monument Cluster	1367	Karağaçpınar	5,57	Midas City	0,00	21,26
23	Bahşeyiş Facade	2	Architectural facade	1147	Karağaçpınar	18,11	Yapıldak Asar Kaya	7,23	15,00
24	Dümrek Complex	15	Monument Cluster	673	Gordion	23,61	Dümrek	0,00	23,54
25	Kızören Facade	1	Small facade	1229	Pessinus	13,63	Zey Kale	36,27	13,00
26	Tekören Altar	1	Stepped Altar	1168	Pessinus	8,51	Zey Kale	21,93	3,03
27	Balkaya Facade	1	Small facade	1210	Büyük Höyük I	9,36	Zey Kale	15,52	1,45
28	Zeyköy Complex	2	Stepped Altar	1126	Tepecik Höyük	2,47	Zey Kale	1,15	4,72
29	Deiktaş Kale	1	Niche	1314	Abiak Höyük	30,62	Deiktaş Kale	2,94	0,25
30	Fındık Complex	47	Monument Cluster	969	Gökçekisik	18,81	Fındık Asar Kaya	0,36	2,22

APPENDIX C

List of the settlements and hilltop sites used in the analysis

site_id	site_name	province	town	village	UTM_eastings	UTM_northings	UTM_zone	length x width	height	site_type
1	Yassıboğuk/Gördön	Ankara	Poltalı	Yassıboğuk	412331	4389461	36N	-1 sqkm		Hilltop Site
2	Demirli Kale	Alyonkarahisar	İsmiye	Demirli Köyü	284363	4329241	36N	150m x 100m	28m	Hilltop Site
3	Kömbük Kalesi	Alyonkarahisar	İsmiye	Alyonkarahisar	288326	4325182	36N	65m x 15m	14m	Hilltop Site
4	Döğür Asar Kaya	Alyonkarahisar	İsmiye	Döğür Beldesi	277622	4335869	36N	57m x 7	16.50m	Hilltop Site
5	Sallı Kaya	Alyonkarahisar	İsmiye	Döğür Beldesi	275747	4328695	36N	87m x 20m	17m	Hilltop Site
6	Uçlar Kaya	Alyonkarahisar	İsmiye	Döğür Beldesi	276789	4329847	36N	24m x 8m	9.2m	Hilltop Site
7	Avdulas Kale	Alyonkarahisar	İsmiye	Avzamlı Beldesi	289448	4322650	36N	220m	11m	Hilltop Site
8	Arslan Höyük	Alyonkarahisar	Merkez	Ablak Köyü	280065	4416014	36N	456m	20m	Hilltop Site
9	Sarıboğuk/Derhisın	Alyonkarahisar	Merkez	Sarıboğuk Mahallesi	280555	4408419	36N	500m	20m	Hilltop Site
10	Karabıyık/Mıdanın	Alyonkarahisar	Merkez	Karabıyık Köyü	316340	4406988	36N	200m	25m	Hilltop Site
11	Kanpazar	Alyonkarahisar	Merkez	Kanpazar Köyü	290078	4384794	36N	280m	9.5m	Hilltop Site
12	Dudulhöyük	Alyonkarahisar	Merkez	Cumhuriyet Mahallesi	290667	4408745	36N	110m	7m	Hilltop Site
13	Kapıye Höyük	Alyonkarahisar	Merkez	Rekin Köyü	279380	4416154	36N	195m	11m	Hilltop Site
14	Gökçekeskik	Alyonkarahisar	Merkez	Gökçekeskik Köyü	276518	4392413	36N	69m	2.5m	Hilltop Site
16	Alyanak	Alyonkarahisar	Merkez	Sevink Köyü	302460	4406779	36N	69m	2.5m	Hilltop Site
17	Bakırcı Höyük	Alyonkarahisar	Merkez	Türkmenotuk Köyü	309894	4394583	36N	210m	8m	Hilltop Site
18	Türkmenotuk	Alyonkarahisar	Merkez	Türkmenotuk Köyü	311955	4391326	36N	100m	4.5m	Hilltop Site
19	Suluhöyük	Alyonkarahisar	Merkez	Kıraydan-Kamlpınar	299159	4393854	36N	75m	10m	Hilltop Site
20	Hoyuçek/İmamr Höyük	Alyonkarahisar	Alpu	Yalını Köyü	361128	4395361	36N	120m	5m	Hilltop Site
21	Yalını Höyük	Alyonkarahisar	Sevinköyü	Yalını Köyü/Kavacak Mevkii	297319	4377340	36N	110m	4.8m	Hilltop Site
22	Kavacak	Alyonkarahisar	Sevinköyü	Beykula Köyü/Ciftlik Yamasi Mevkii	310238	4366168	36N	100m	5m	Hilltop Site
23	Ciftlik Yamasi	Alyonkarahisar	Sevinköyü	Zaferhamit Köyü	340442	4371228	36N	75m	12m	Hilltop Site
24	Zaferhamit	Alyonkarahisar	Sevinköyü	Sarıören (Alpanaz) Köyü	295643	4381073	36N	140m	14m	Hilltop Site
25	Alpanaz	Alyonkarahisar	Sevinköyü	Sarıören (Alpanaz) Köyü	294297	4382655	36N	66m	9m	Hilltop Site
26	Kozağzı	Alyonkarahisar	Sevinköyü	Sarıören (Alpanaz) Köyü	294617	4386443	36N	100m	4.8m	Hilltop Site
27	Kranhöyük	Alyonkarahisar	Sevinköyü	Kanpazar Köyü	307950	4341388	36N	80m x 25m	30m	Hilltop Site
28	Kanagöppınar	Alyonkarahisar	Sevinköyü	Derbent Ciftligi	291078	4390477	36N	7 x 25m	25m	Hilltop Site
29	Derbent	Alyonkarahisar	Sevinköyü	Çukuren Köyü	299564	4348259	36N	133m x 47m	13.40m	Hilltop Site
30	Döğanlı Kale	Alyonkarahisar	Sevinköyü	Kumbet Köyü	295674	4342831	36N	380m x 150m	33m	Hilltop Site
31	Bağlık Kale	Alyonkarahisar	Sevinköyü	Kumbet Köyü	295674	4342831	36N	12m x 5m	11m	Hilltop Site
32	Demirkapı Kalesi	Alyonkarahisar	Sevinköyü	Kumbet Köyü	298266	4344652	36N	30m x 27m	13m	Hilltop Site
33	Yapıdaki Asar Kule	Alyonkarahisar	Sevinköyü	Yapıdaki Köyü	297215	4344657	36N	84m x 45m	18m	Hilltop Site
34	Yapıdaki Asar Kaya	Alyonkarahisar	Sevinköyü	Yapıdaki Köyü	297214	4344657	36N	75m x 18m	12.50m	Hilltop Site
35	Dulbecek Kale	Alyonkarahisar	Sevinköyü	Yapıdaki Köyü	297115	4344657	36N	64m	27.50m	Hilltop Site
36	Besseyaz Asar Kule	Alyonkarahisar	Sevinköyü	Besseyaz Köyü	301324	4340126	36N	7 x 42m	32m	Hilltop Site
37	Alman Kale	Alyonkarahisar	Han	Yazıkaya	290441	4369704	36N	64m x 35m	Hilltop Site	Hilltop Site
38	Pınar Kale	Alyonkarahisar	Han	Yazıkaya	302739	4344757	36N	30m x 24m	17m	Hilltop Site
39	Gökçöz Kale	Alyonkarahisar	Han	Yazıkaya	303657	4343154	36N	84m x 45m	18m	Hilltop Site
40	Kozağzı Kale	Alyonkarahisar	Han	Yazıkaya	303555	4343666	36N	75m x 18m	12.50m	Hilltop Site
41	Dereboyni Kalesi	Alyonkarahisar	Han	Yazıkaya	304350	4343027	36N	64m	27.50m	Hilltop Site
42	Yıldız Şehri	Alyonkarahisar	Han	Yazıkaya	303862	4345761	36N	7 x 42m	32m	Hilltop Site
43	Hançar Höyük	Alyonkarahisar	Han	Yazıkaya	302391	4341083	36N	64m x 35m	Hilltop Site	Hilltop Site
44	Yespür	Alyonkarahisar	Mahmutiyeye	Yespür Köyü/Örenler Mevkii	310531	4348406	36N	660m	8m	Hilltop Site
45	Kozağzıvarını	Alyonkarahisar	Mahmutiyeye	Balıkbisar Köyü	319501	4382266	36N	350m x 200m	36N	Hilltop Settlement
46	Yalıncıyazır	Alyonkarahisar	Beylikova	Emreçik Köyü	338925	4383888	36N	150m	8m	Hilltop Site
47	Döğay Höyüğü	Alyonkarahisar	Beylikova	Döğay Köyü	351003	4399569	36N	400m x 250m	19m	Hilltop Site
48	Karacakaya	Alyonkarahisar	Beylikova	Uzambarın Köyü/Kartalteppe Mevkii	354518	4396250	36N	250m x 75m	7m	Hilltop Site
49	Kalebaşı/Dumlek	Alyonkarahisar	Beylikova	Dumlek Köyü	336644	4396990	36N	70m	4m	Hilltop Site
50	Aktepe Kalesi	Alyonkarahisar	Mihalıcık	Seki Köyü	405592	4412089	36N	75m	4m	Hilltop Site
51	Adahisar Kalesi	Alyonkarahisar	Mihalıcık	Adahisar Köyü	378878	4422898	36N	250m x 75m	7m	Hilltop Site
52	Yük Tepesi	Alyonkarahisar	Mihalıcık	Glaz Köyü	364794	4394951	36N	70m	4m	Hilltop Site
53	Dombaz Höyük	Alyonkarahisar	Mihalıcık	Çele Köyü/Dombaz Mevkii	357728	4412260	36N	75m	4m	Hilltop Site
54	Uçbaşı Kale	Alyonkarahisar	Mihalıcık	Uçbaşı Köyü	365175	4422651	36N	40m	4m	Hilltop Site
55	Balıhbisar/Pesimus	Alyonkarahisar	Stırhisar	Balıhbisar Köyü	385186	4406638	36N	Urban Complex		Hilltop Site
56	Zey Köyü	Alyonkarahisar	Stırhisar	Zey Köyü/Kate Mevkii	377852	4354620	36N	200m	10m	Hilltop Site
57	Tepelik Höyük	Alyonkarahisar	Stırhisar	Zey Köyü/Tepelik Tepesi Mevkii	369406	4387724	36N	36N	36N	Hilltop Site
58	İbşavay Höyüğü	Alyonkarahisar	Stırhisar	Sırtkavak Köyü	369444	4381429	36N	36N	36N	Hilltop Site
59	Bayrak Höyük I	Alyonkarahisar	Stırhisar	Aslak Keçen Köyü	365251	4381201	36N	300m	8m	Hilltop Site
60	Bayrak Höyük II	Alyonkarahisar	Stırhisar	Demirel Köyü/Örenler Mevkii	370194	4380621	36N	300m	17m	Hilltop Site
62	Fındık Asar Kaya	Alyonkarahisar	Merkez	Fındık Köyü/Inice Mah	260495	4382731	36N	195m x 75m	29m	Hilltop Site
63	Deliktas Kalesi	Alyonkarahisar	Merkez	Ovacık Köyü/Inice Mah	277546	4343346	36N	70m x 28m	22m	Hilltop Site
64	Döğuluş Kalesi	Alyonkarahisar	Merkez	Döğuluş Köyü	257752	4379519	36N	70m x 28m	12m	Hilltop Site
65	Göçeri Kalesi	Alyonkarahisar	Merkez	Göçeri Köyü	265095	4350778	36N			Hilltop Site