

Exploring Rivers and Ancient Settlements in Aegean Thrace through Spatial Technology

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Introduction: The River Geography of Thrace

Since the early civilizations, the rivers as dynamic carriers of natural and cultural forces had a deep impact on human landscapes.¹ Nevertheless, the ancient Greek civilization was never really a waterway culture since most of the rivers of mainland Greece were small, not navigable and quite often torrential in their character.² In sharp difference to the south, the geography of northern Greece and more specifically the Aegean Thrace (fig. 1),³ is characterized by the presence of two major rivers:⁴ Nestos to the west, and Evros to the east, the second largest river of the Eastern Europe with a total length of 515 km.⁵

To these large river systems, we should also add many tributaries flowing in the plain that extends between the modern regional centers of Xanthi and Komotini: Kompsatos, Kosynthos and Travos, all of which discharge in Vistonis Lake and Lissos in the Aegean Sea. These along with a considerable number of small creeks or torrential rivers that flow from the highlands of Rhodopi to the coastal area, shaped not only the physical but also the cultural landscape as ethnic, tribal or cultural boundaries in Aegean Thrace.

This was an area of significant importance not only for its physical variability in river landscapes but mostly as the meeting point of the Aegean world of the Greek city states (*ἀποικία*) with the inland cultures of various Thracian tribes like the Sapaiani, Vistonians or Kikonians who inhabited the area (Hom 2.864; Hdt 7.110). A major development in the settlement pattern of the area (fig. 2) occurred in the early 7th century BC, when Greek-Ionian settlements began to get established along the coast.⁶ During the late Classical and early Hellenistic period the area became part of the Macedonian kingdom⁷ and occasionally fell in the grasp of the various tribal Thracian rulers.⁸ Later the official annexation (46 AD) of this large region to the Roman Empire⁹ radically changed the existing settlement and urbanization framework with new cities being founded closer to the Via Egnatia, a major military and commercial road of the empire that crossed the area towards Byzantium.¹⁰

Scope of this project is to explore the impact of these large rivers on the local economy over time and how this is reflected on the spatial scale. Thus, our main research objectives seek to illustrate an overview of the region archaeologically in terms of settlement and economy and to investigate with the contribution of spatial technology (Open source GIS) how site placement relates to the wider environment. More specifically, we aim to explore to what extent the proximity to a river played a role as a criterion for the selection of a settlement to be established at. This is of great interest particularly in the case of the *apoikiai*, since it could contribute to a better knowledge and understanding of the decision strategy behind their foundation.



Fig. 1: The River and Wetland geography of Aegean Thrace.

To this direction the employment of open source GIS technology¹¹ (here the open and renewable QGIS) with advantages like transparency of code, openness to public scrutiny, public availability, portability, transferability and support by a growing online community can provide the archaeological community with a research tool that with minimal effort and no costly private licenses can be available to anyone who is willing to phrase the appropriate questions over any set of data. What follows are some first observations and preliminary results from this ongoing project.

Fluvian Landscapes and Economic Perspectives

The importance of rivers and their adjacent fluvial landscapes as economic vectors – zones is without doubt immense.¹² Since navigability was clearly not the case with the rivers of Aegean Thrace (with the probable exception of the northern part of Evros¹³) any discussion about the economic role of the different river systems should focus primarily on their relationship with farming activities.¹⁴ All accounts agree that the economy of the river valleys or of the great alluvial deltaic plains is underpinned by agriculture because of their natural fertility.¹⁵ Consequently, the presence of large water bodies like the rivers Nestos and Evros along with their tributaries led to the logical

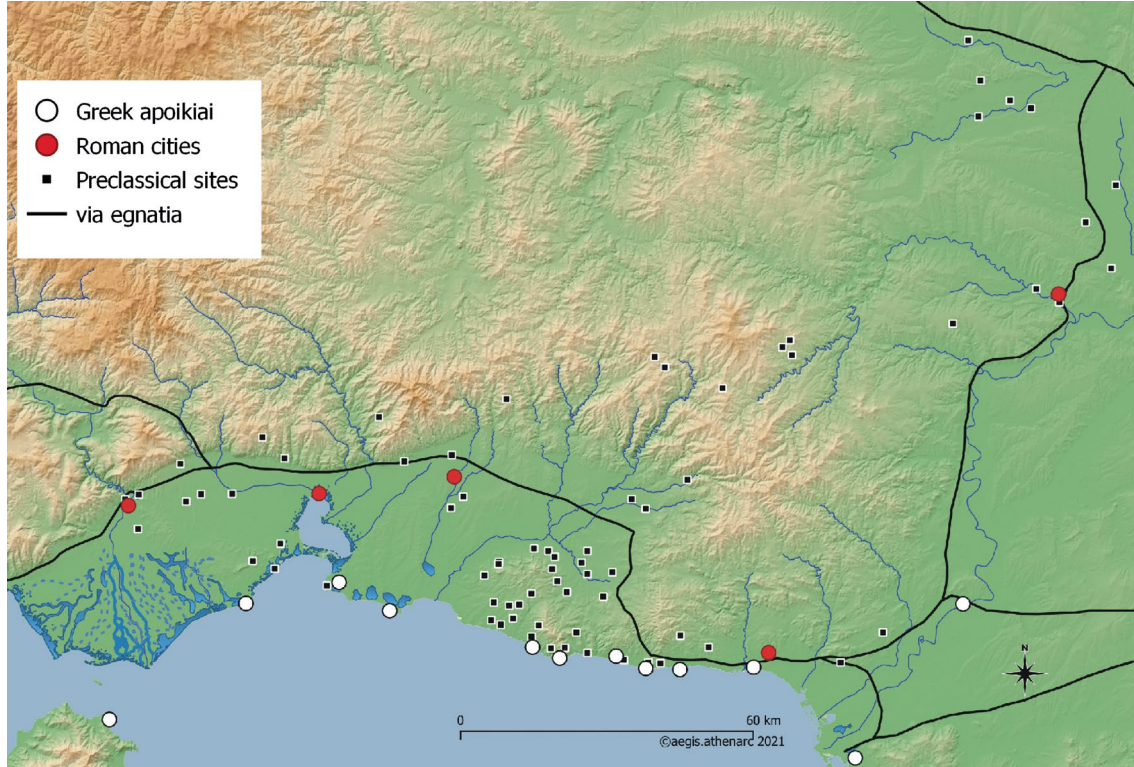


Fig. 2: Distribution of major sites in Aegean Thrace from the Late Iron Age to Roman times.

assumption that the economy of the area must have been in a great extent agricultural, fed by the ample provision of fresh water.¹⁶ This is further supported by ancient sources like Pindar (Paeon 2.25–26. 60), Diodorus Siculus (13.7.2) or Homer (Iliad 11.222) who mention the fertility of Thrace, which is characterised as εὐκαρπος and πολὺδωρος.

Although river floodplains could be attractive for agricultural use there are undoubtedly many other factors (topography, altitude, rainfall) that must be considered to determine what type of economic activities took place on a certain area. Thus, a crucial point in our analysis of how this land was used in antiquity is to determine the amount of arable land and the quality of soils provided by the specific rivers.

Today the lands in the plain of Nestos, Lissos – Kompsatos and along the valley of Evros are heavily and densely cultivated but this might have not always been the case. The ancient landscape appears to be quite different due to many environmental variables and restraints. One of them was the presence of large areas of wetland (fig. 1) extending along the coast for over 100 km.¹⁷ The system includes the Nestos Delta with the lagoons of Keramoti at the west, the Vistonis Lake¹⁸ with the area of Porto Lagos in the middle and the Thracian Lagoons to the east. For the large area that stretches between Xanthi and Komotini, the semi-torrential rivers Kosynthos, Kompsatos and Travos that carry large amounts of fresh water from the mountains formed an extensive wetland.

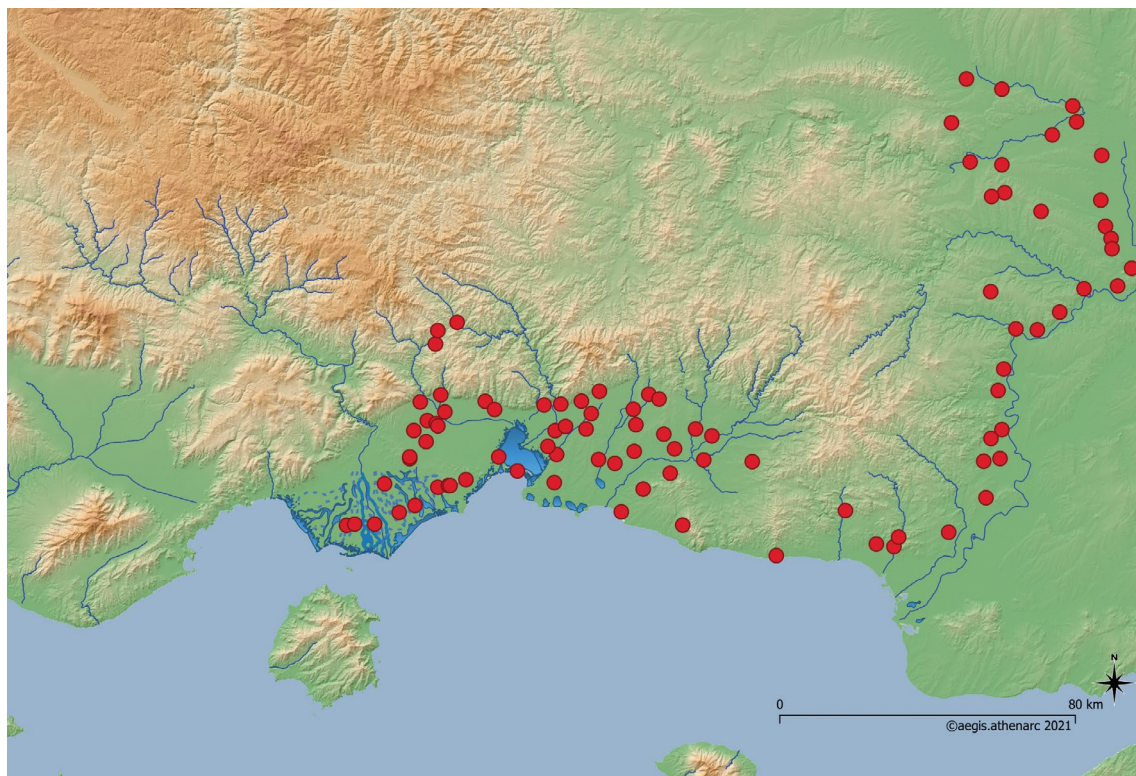


Fig. 3: Recorded Floods in Aegean Thrace (based on the ‘Plan 12 Thrace Region Map’ created by the Ministry of Environment, Energy and Climate Change, Special Secretariat for Water).

Wetlands¹⁹ as such can encompass a wide range of different types of terrains, such as fens, bogs, marshes, swamps, shallow lakes (Chrysoupoli), or fresh or saltwater marshes like those forming the landscape around the current Lake Vistonis but also much of the coastal area near the Greek colony of Abdera (Lafri and Lafrouda sandunes). This type of areas can support vegetation adapted to the wet conditions (hydrophytes) but mostly are characterized by the absence of flooding-intolerant vegetation like cereals, which seem to constitute the basic cultivated crop in ancient farming societies. In such wetland areas, only low-intensity agricultural activities are expected but not the systematic farming that could sustain organized societies based primarily on agriculture. Similarly to wetlands large areas around the fresh water bodies were covered by riparian forests like that of Nestos known as “Kotza Orman” (Great Forest), which at the beginning of the 19th century covered approximately an area extending over 124.000 acres.²⁰

The extensive wetlands, the riparian forests²¹ in addition to flood-stricken zones (fig. 3) must have significantly limited the amount of land suitable for agriculture. Flood zones for instance were important determinants for settlement and farming. The violent character of flash flooding (typical for the secondary rivers of the area) was hazardous for agriculture while seasonal flooding as observed in the Evros sub-basin could have

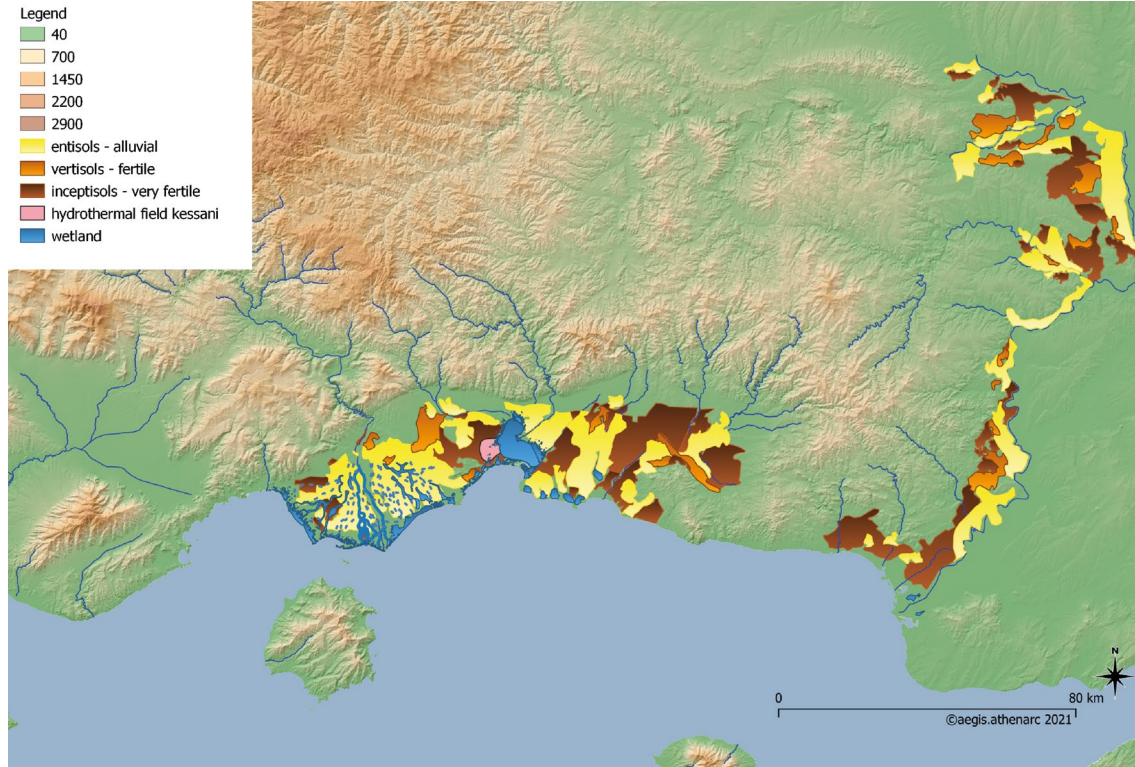


Fig. 4: Soil map of Aegean Thrace (based on soil map produced by the Aristotle University of Thessaloniki, School of Agriculture, Lab of Applied Soil Science).

seriously affected the existing schemes of land division as was the case until recently with Erythropotamos.²²

To these environmental restraints we should add the quality of the soils.²³ The entisols, vertisols and inceptisols, which dominate the area (fig. 4),²⁴ are chiefly clay type soils that when saturated with water can go into peraquic condition.²⁵ Consequently, the heavy texture and unstable behavior of these soils makes it difficult for many crop and tree species to grow. In these soils, rain-fed farming can prove to be very difficult because vertisols and entisols can be worked only under a very narrow range of moisture conditions: they are very hard when dry and very sticky when wet.²⁶ This kind of soil because it is almost impermeable when saturated can be beneficiary for the cultivation of rice or kiwis (products of the modern local agriculture), but they are not suitable for basket feeders of agricultural societies like cereals (wheat, rye, barley).

Therefore, early agriculture in these fluvial landscapes could have been plagued by poor growing conditions. Moreover, despite the proximity to large water bodies many of the soils encountered in the region (especially around Komotini) are characterized by lack – as noticed by the original SPRP²⁷ (Survey Project of the Rhodopi Plain) survey of 1992 – of natural water resources, something that would have further hindered agricultural potentials.

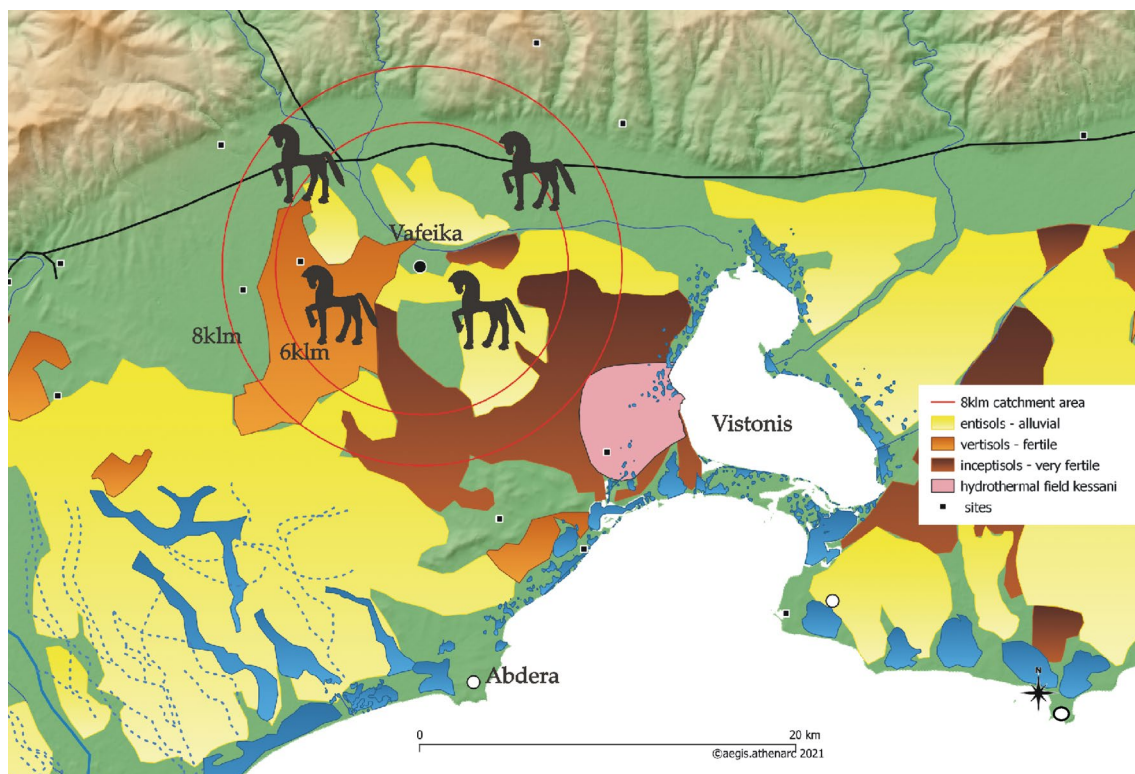


Fig. 5: The Vistonian heartland: 8 km buffer zone around the Early Thracian site discovered at Vafeika near the shores of River Kosynthos.

Nevertheless, the different micro areas,²⁸ clearly support a great variety of food producing activities besides cereal farming like river fisheries or hunting, which would have contributed significantly to the local economies. Most importantly the entisols, inceptisols and vertisols would have been perfect for cattle or other type of animal herding.²⁹ Aside from soil order, pastoral farming is more likely to be found in areas with cold strong winds and a wet climate and from this perspective the region is perfect since the prevailing north or northeast winds that dominate during the winter and summertime can reach speeds up to 8–9 Beauforts (60–70 km/h). All these conditions are more advantageous to raising livestock than crops. Therefore, we can envisage terrains that could have supported a pastoral type of economy based on large herds grazing on the extensive areas of grassland as is attested for the Vistones (fig. 5) who fed their horses in the waters of the river Kosynthos.³⁰

In order to sum up we should keep in mind that the various accounts that see Thrace as a “granary” usually make general references to the extensive land, reaching Euxeinus Pontos to the east and river Danube to the north.³¹ As for the Aegean Thrace though, it appears that there were serious environmental restraints, which, to a certain extent, were dictating the range of financial activities taking place here.³² The important question is how these environmental restraints are reflected in the settlement patterns.

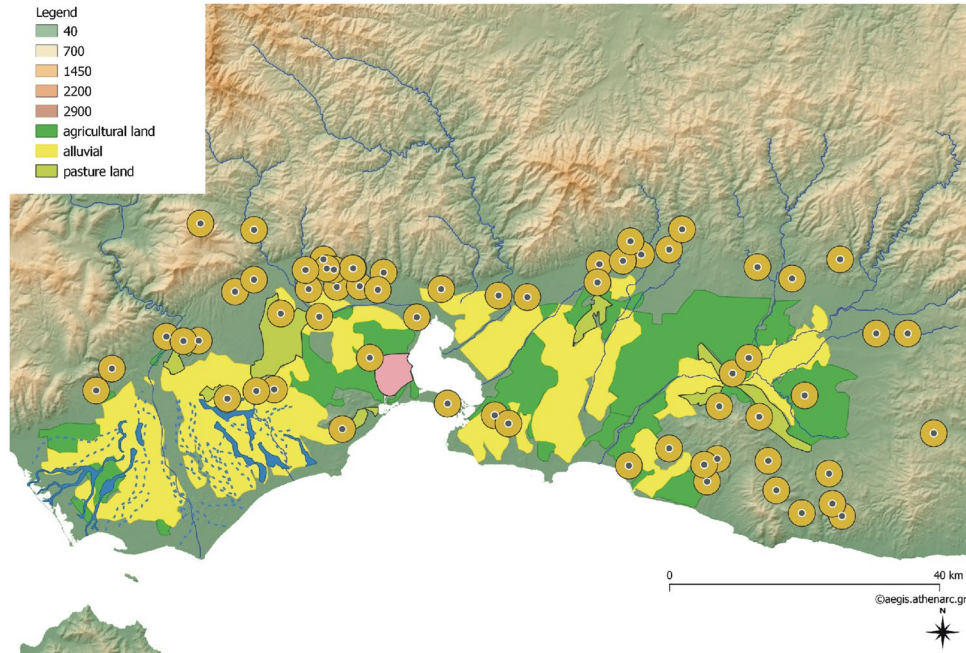


Fig. 6: Rural sites of Aegean Thrace with 2 km buffer zones (possible agricultural zones).

Environmental Restraints and Strategies of Settlements

A key observation regarding the settlement patterns of the region is the following: although it is commonly accepted that settlements are clustered near water bodies, the spatial data indicate that the largest concentration of urban (with some exceptions) and rural settlements is in a relative safe distance from major active rivers. The combination of river avulsion, frequent flooding, major shifts in the river courses and areas covered by swamps, riparian forests and wetlands would have made the broader Nestos and Northern Evros floodplain generally unsuitable for habitation.³³ Furthermore, the high-water table (characteristic for clay type soils like entisols³⁴), the flat alluvial plains, and frequent flooding have the potential to expand the available breeding sites for the *Anopheles* mosquito, the major carrier of malaria.³⁵ The sites appear to cluster toward elevations in the landscape, mostly between 170–180 m. and 200 m. in the margins above the impact of flooding, river movements, poor drainage and mosquito zones. Localities such as the formation of the low hills that appear in the plain of modern Komotini area (the catchment area of Kompsatos) or the western bank of Evros would have provided protection from flooding thus allowing the development of rural settlements.³⁶

To a great extent, knowledge about the settlement patterns of the local Thracian communities remains sporadic and limited.³⁷ The historical sources provide scant information and not always trustworthy. As elsewhere in Iron Age northern Greece, the settlements identified in western Rhodopi (like the Asar Tepe Ergane, Xylagane,

Sarakine, Toxotes) are mostly fortified sites in the elevated zones, which possibly controlled smaller rural settlements lying regularly in the foothills or in localities near the smaller rivers like Kosynthos.³⁸ In the lowlands many settlements reveal themselves as mounds standing above the flat country around them. Fortified *akropoleis* and rural settlements may represent the existence of many local economic and cultural units that were based on low intensity farming (normally in a range of 2 km around the settlement) and cattle herding (fig. 6). As aforementioned large tracts of land in the alluvial plain, especially in the area between Nestos River and the Vistonis Lake, had the profile of an extended grassland and thus were appropriate for cattle or animal herding. Since even small herds (of cattle and horses) require relatively large tracts of land (1.8 acre per cow), this would have reduced even further the amount of available arable land for systematic agriculture.³⁹

The ancient sources like Herodotos⁴⁰ (5.6; 2.167.1) state that Thracians underrated agriculture. Clearly this can be received as an overstatement. Low intensity agriculture in short range from the settlements (fig. 6) was probably a very viable way for many tribal units to secure a successful living. Nevertheless, the lack of great urban agglomerations can be possibly seen as an indication that systematic agriculture on a massive scale was absent. On the other hand, the remarkable cluster of pre-Classical sites around the foot of Mount Ismaros (fig. 2) seems to be related mostly with the exploitation of the rich minerals rather than agriculture.

An interesting question that arises as an outcome of the results above is how the Greek colonies fit within this specific environmental and economical context. As aforementioned a common view concerning the colonization process here is that it was motivated by agrarian purposes.⁴¹ The fertility of the region well attested by the ancient sources (Pindar 2.25–26), attracted the colonists who exploited the rich alluvial plains in expense of the local tribes. This seems to be the case of the Samothracian Peraia (Sale, Zone, Drys), which tried to secure the agricultural products that their island cities so desperately needed.⁴² However, when the discussion comes to the larger cities such as Abdera and Maroneia,⁴³ the examination of spatial information leads to some interesting observations.

In sharp difference with Amphipolis and Ainos, at Strymon and the east bank of Evros respectively, which were founded to control navigable rivers, the relationship between the rest of the Greek colonies and the major rivers is small. Although Herodotos (7.126) describes how Nestos crosses the fields outside the walls of Abdera, the city was founded in the safest possible distance from the deltaic plain.⁴⁴ The predominant characteristic behind all colonial settlement (Abdera, Dikaia, Maroneia, Zone and Sale) along the flat surf-stricken coastline of Thrace was their location near good natural harbors, which admittedly is a rarity for the area. This emphasis on the sea and the need to secure and retain a safe link with the rest of the Greek world was such that in both Maroneia and Abdera, the building of new harbors was deemed necessary.⁴⁵

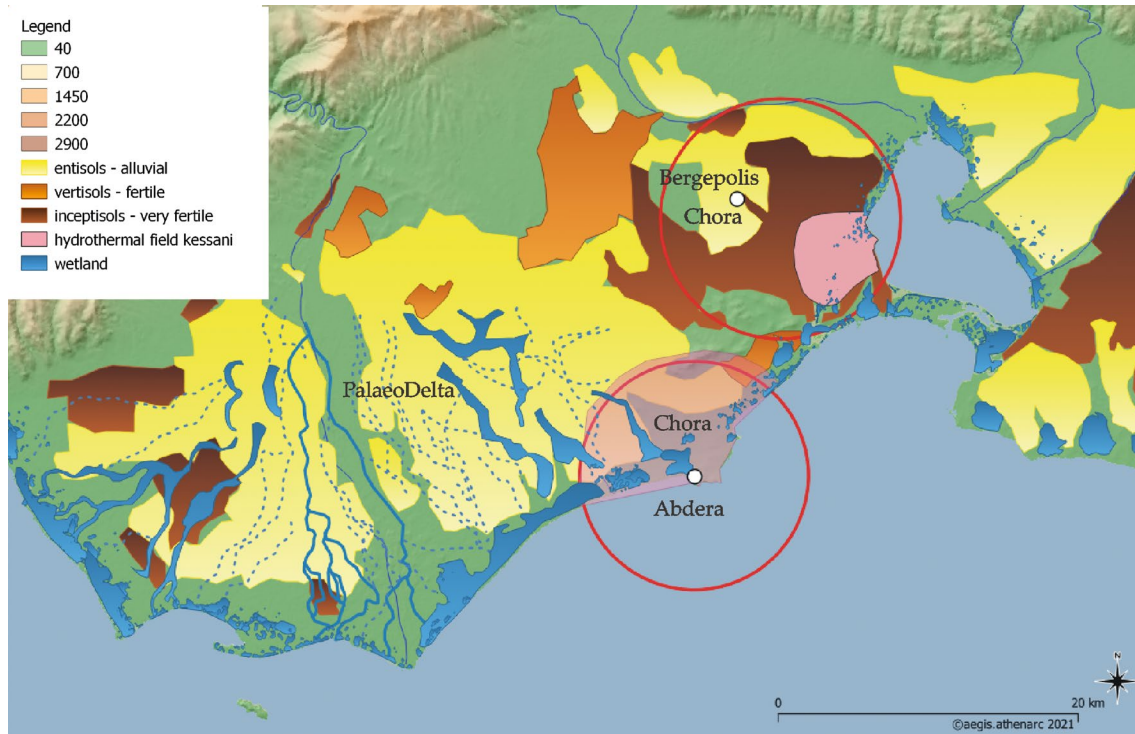


Fig. 7: Abdera and Bergepolis (Koutso) with 6 km buffer zones representing the ancient chora.

Whether these colonies – especially Abdera – were founded with a primary goal to exploit the alluvial plains remains unknown.⁴⁶ Undeniably views and theories about the geographic characteristics of these settlements seem to have been based on stereotypical models imported from other areas of the early Archaic Greek colonization like Magna Grecia⁴⁷ where the seek for fertile land was the main motive behind the colonial establishments. The *chora* of Abdera,⁴⁸ which originally did not exceed the mark line of the Thracian settlement at Mandra, the six-kilometer buffer area known from other Greek cities, included soils (and among them large areas of wetland) that could not support the necessary high-intensity cereal agriculture.

This probably justifies the foundation (sometime at the 5th century BC) of Bergepolis (fig. 7), a subsidiary city in the hinterland. Bergepolis, which is most probably identified with the remains of a settlement found in the modern village of Koutso (on the west bank of Vistonis),⁴⁹ is situated in the center of a zone dominated by inceptisols soils that could – to a certain extent – have supported an intensive cereal crop production. The foundation of Bergepolis essentially doubled the rural chora of Abdera. Bergepolis as well as similar sites that were founded from Maroneia, such as Linos at the foot of Rodopi,⁵⁰ clearly shows the effort of the Greeks to establish themselves in the agricultural heart of the region away from the dangerous course of the great rivers.

However, this expansion, so necessary for the rural self-sufficiency of the population, took place at a later stage, when the cities had already acquired the power to maintain the stability that was necessary for the achievement of their rural objectives.

At the same time though it is worth noting that despite the control of the hinterland, the indigenous settlement structure remained essentially unaltered and many of the sites continued to exist throughout the Classical and Hellenistic era. This is a serious indication that the modes of economic exploitation in the area did not radically change.

Conclusions – Discussion

Already from 1992 the SPRP gave special emphasis to “*a persisting system of environmental conditions and human responses*”. It is obvious that the environmental factors, in this case mainly the alluvial process and the existence of extensive fluvial landscapes, affected (directly or indirectly) the economy and the settlement patterns of the area. Naturally this is not something new or particularly groundbreaking. What is interesting in the case of the Aegean Thrace is the mingling of different cultural elements that compete for the same resources, while at the same time faced the same environmental challenges.

It is also clear that besides “life-givers” the large rivers dominating the region, created (due to a series of ecological restraints) large areas unsuitable for habitation or systematic exploitation. The most important restriction was the quality of the predominantly clay type soil that would certainly have limited the real agricultural potential of the area, especially in the large floodplains. These environmental factors combined with cultural constraints formed to a large extent the settlement patterns of the indigenous tribes.

Low intensity farming (characterized by low yield per hectare), little investment in land drainage and crops suited to specific regional conditions in conjunction with livestock breeding, which was favored by the terrain, was probably the dominant type of a mixed economy. This, we think, is reflected in the absence of great native urban agglomerations. The same environmental conditions must have affected to a certain extent the decision strategy and economy of the Greek coastal colonies. Undeniably the different environmental factors indicate the existence of many individual local economies, which developed within the well-defined geographical and environmental micro-zones. The Thracian settlements with the mountainous forts and the emphasis on animal herding and low intensity farming represent one group. The Greek trade colonies and their gradual expansion towards the interior with the clear aim to control land routes⁵¹ and fertile land another. These were occasionally conflicting but, in many cases, they seem to have functioned reciprocally as the Maroneia case proves.

In conclusion we can say that the environmental factors like the extensive mosquito zones, the extensive riparian vegetation, the clay type soils or the extensive floods are factors that should be seriously considered when analyzing the economy and habitation of such culturally diverse area. If we go further, it becomes clear that the environmental reality quite often contributes significantly to the archaeological research.

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Notes

¹ Tilley 1994, 124–136; Strang 2004; Edgeworth 2011.

² Mariolakos 2017; Skoulikidis et al. 2017.

³ Bouzek – Graninger 2015, 12–21.

⁴ Skoulikidis et al. 2009, 421–466.

⁵ Handrinos et al. 2005.

⁶ Baralis 2008; Tiverios 2008.

⁷ Isaac 1986; Hatzopoulos 1996, 186. 245 f.

⁸ Archibald 1998; Delev 2018, 192 (on the late Odryssian kingdom).

⁹ Loukopoulou 1987; Avramea 2003; Lozanov 2015, 75–90.

¹⁰ Lolos 2007.

¹¹ Hodgkinson 2010; Orengo 2015, 64–82; Bibby – Ducke 2017

¹² Newson 1994; Tóth 2006. See the discussion in Franconi 2017.

¹³ De Boer 2010.

¹⁴ Zeder 2006; 2008; Zeder – Smith 2009.

¹⁵ Brown 1997; Zeder – Smith 2009, 686.

¹⁶ Casson 1968, 9 f.

¹⁷ Gerakis 1992.

¹⁸ Diamantis 1985; Babjimopoulos – Antonopoulos 1992.

¹⁹ Palang et al. 2007.

²⁰ Papaioannou 1953.

²¹ Verry et al. 2004.

²² Koutsoyiannis et al. 2012.

- ²³ USDA 1975, (Vertisols 375) (Inceptisos 227) (Entisols 179).
- ²⁴ <<https://esdac.jrc.ec.europa.eu/content/soil-map-east-macedonia-thrace-region-soil-textural-classification-map>> (source ESDAC European Soil Data Center)
- ²⁵ Yassoglou et al. 2017, 71–85.
- ²⁶ Ehrmann et al. 2007.
- ²⁷ Efstratiou 1996; Efstratiou – Ammerman 2004; Ammerman et al. 2006.
- ²⁸ Efstratiou – Ammerman 1996.
- ²⁹ Mace – Houston 1989, 185–204; WISP 2007, 1–4.
- ³⁰ Triantaphyllos – Kallintzi 1998.
- ³¹ Hom. Il. 11. 222; Pindar 2.25–26, 60.
- ³² Ammerman et al. 2006.
- ³³ See generally Zeder 2006; 2008.
- ³⁴ USDA 179.
- ³⁵ Manguin 2013.
- ³⁶ Ammerman et al. 2006.
- ³⁷ Triantaphyllos 1987–1990; Baralis 2008, 114; Triantaphyllos 2009.
- ³⁸ Triantaphyllos 1990; Baralis 2008, 105–107; Matsas 2017a; Matsas 2017b; Kallintzi – Papadopoulos 2017; Triantaphyllos 2017.
- ³⁹ Ingold 1980; Mace – Houston 1989.
- ⁴⁰ Hdt 5.6: “The idler is most honored, the tiller of the soil most scorned; he is held in highest honor who lives by war and robbery” (transl. A. D. Godley 1922, Loeb Classical Library).
- ⁴¹ Baralis 2008, 113 f.
- ⁴² Tiverios 2008, 107–109.
- ⁴³ Karadima 2017.
- ⁴⁴ Isaac 1986, 72; Kallintzi 2011; Kallintzi 2017.
- ⁴⁵ Samiou 1999.
- ⁴⁶ Isaac 1986, 108 where he emphasizes the strategic role of the site and the prosperity as a result from the contact with the Thracians.
- ⁴⁷ Baralis 2008, 113.
- ⁴⁸ Kallintzi 2011.
- ⁴⁹ Tiverios 2008, 96.
- ⁵⁰ Baralis 2008, 120.
- ⁵¹ Salviat 1999; Delev – Popov 2002; Palavestra 2007; De Boer 2010.

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