

IMPACT OF A MILITARISTIC SOCIETY:  
A STUDY ON THE HITTITES

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# THE ECONOMIC IMPACT OF A MILITARISTIC SOCIETY: A STUDY ON THE HITTITES

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The purpose of this study is to better understand the relationship between the military, the economy, and the societal collapse of the Hittites, a militaristic society. The Hittite empire suffered from many problems near the end of its existence, but this research supports the idea that the military's demand for subsistence goods was too great for the economy to provide. By analyzing historical documentation, many aspects of the Hittite culture can be examined, such as trade networks as well as military campaign reports. The study also looks at the archaeological excavations of Hattusa, the Hittite capital, and Kaman-Kalehöyük, a supply city that would restock the campaigning military. By examining these cities and historical documentation, better understanding of the economy and military will be attained for militaristic societies; and in the case of the Hittites, their relationship to the societal collapse is determined to be strong.

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## INTRODUCTION

Civilizations are always changing, and in some cases disappearing. There are numerous theories out there on why the militaristic Hittite empire collapsed between 1200-1100 B.C. External attacks stimulating the collapse of civilization is a popular theory. The Sea Peoples, a group of sea raiders who attacked the region, are one such possible external force, which lead to the collapse of the Hittites and various other societies in the region, (Bryce 1998); but this is only one theory. Many theories are based on research done on particular elements of the empire, while some of the more recent theories are based on numerous elements. C.F.A Schaeffer, a well-known theorist, believed that the collapse was caused by an earthquake, while another theorist, Rhys Carpenter, believed that a massive drought caused the Hittite empire to crumble (ibid.). Overall, there have been a wide range of theories about why the empire collapsed.

The purpose of this study is to provide support for the theory that the primary catalyst for the collapse of the Hittite empire was from over taxation of resources, in order to acquire needed subsistence goods, to support the military. The study itself will look both at historical documentation, as well as archaeological remains, such as grain storage. While there have been countless studies conducted on the food shortages the Hittites faced, not many have considered support and maintenance of the military as a primary motivating factor. This study will examine both the Hittite military and its economy, by looking at historical documentation, the acquisition of goods through conquest and trade networks, as well as through storage facilities, that were utilized near the end of the Hittite empire.

The study will first look at the history of the Hittites as it pertains to societal instability/kingship, warfare, and economy. It will then look at the history of the two sites that are focused on in the study, Hattusa and Kaman-Kalehöyük. The following section will then discuss the methodology that was utilized to conduct the research through data collection of archaeological remains and historical documentation. In the next two sections the results of the analyzed data are presented. The final section presents conclusions based on the results of the data and historical documentation.

This study supports the idea that the economic impact of the Hittite military played a major role in the empire's collapse. This outcome could help our understanding on why civilizations collapse and suggest that militaristic empires can last as long as their military is successful and can be supported, by the economy. This research could then be applied to many other civilizations involved in warfare, both past and present, by making predictions on what the economic impact could be and how they could avoid potential economic collapses and then societal collapse.

## **THE HITTITE EMPIRE AND ITS DEMISE**

The Hittites were initially a part of an Indo-European language group whose origins are still heavily debated to this day. They arrived in the central Anatolian region around 2200 B.C, also referred to as the “Land of Hatti,” which was initially settled by the Hattians, a local agrarian culture (Bryce 1998). The actual “Hittites” were probably originally known as the Nesi, and spoke Nesite, but they adopted the name Hittite based on the name of the settlement Hattusa, which became the capital of the empire (Yazıcı 2011). The Hittite culture itself was actually a mix of both Hattian and Indo-European elements (Bryce 1998). The Hittite empire was primarily based in central Anatolia, but as a militaristic empire, they were constantly campaigning to gain both more territory, and better access to trade networks. As such, their borders were constantly changing. The region in which the Hittites were based in is seen in Figure 1.

### **The History of a Militaristic Empire**

“By 1750 B.C. the Hittites had become a kingdom, and by 1500 B.C. they were an empire,” (Yazıcı 2011, pg 31). Since the purpose of this study is to provide support for the idea that the economic impact of a militaristic society was the catalyst for the collapse of the Hittite empire, the focus will be on the New Kingdom period, which is generally believed to have begun around 1400 B.C.

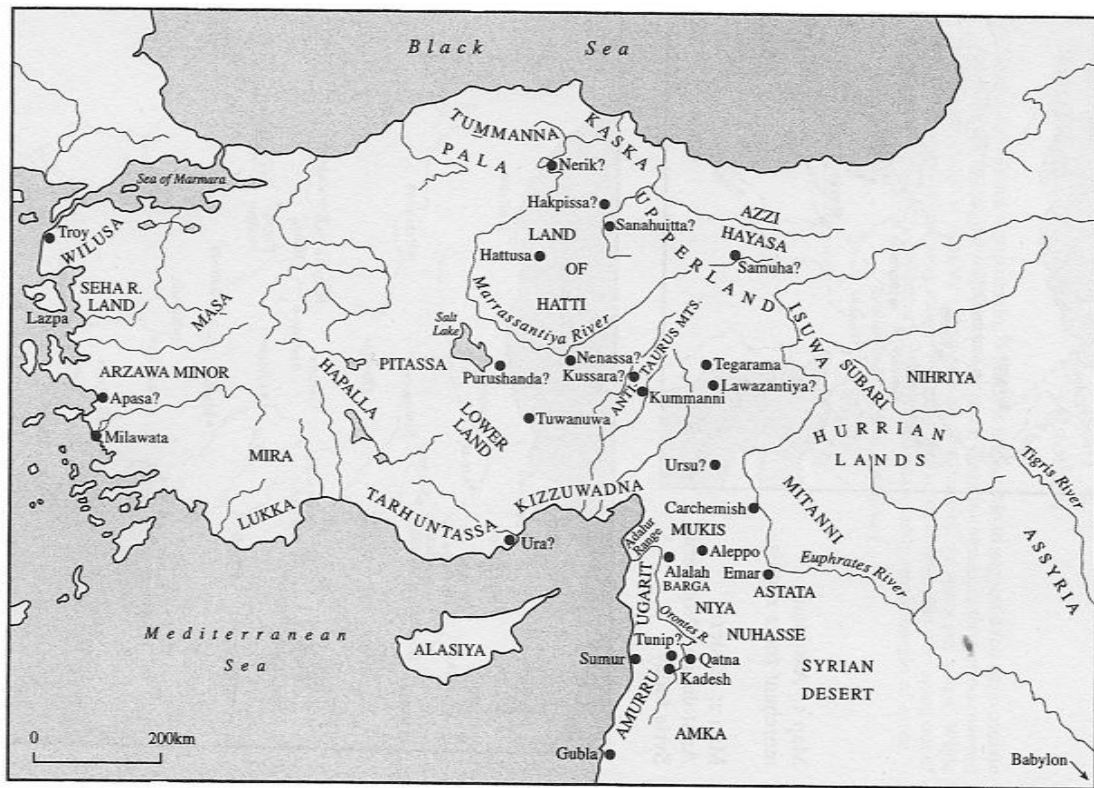


Figure 1. The world of the Hittites.(Bryce 1998:Map 3).

### Political Chronology

The Hittite New Kingdom was a period of military success and prosperity, which was representative of the power of the kings. Initially the Hittites faced a long period of political and economic turmoil while involved in many wars and revolts at the start of the New Kingdom (Yazıcı 2011). These problems dissolved, for the most part, once a competent king was crowned.

The first king of this period was Tudhaliya I which can be seen in Table 1. Tudhaliya I is an important king, who truly established the Hittite Empire as a great power until its collapse. During his reign, Hittite and Egyptian interests over particular regions clashed. Tudhaliya I co-ruled at some point with his son, Arnuwanda I, and together they led a rather successful period



for the Hittites in the fact that it was relatively stable. The fact that the two ruled together is a rather unique instance in Hittite history, and is not fully understood at this time (Cimok 2011).

Table 1. Succession of Hittite Kings in the New Kingdom period.  
(Bryce 1998 and Cimok 2011) *Adapted*.

Tudhaliya I	1400-
Arnuwanda I	-1360
Tudhaliya II	1360-
Tudhaliya III	-1344
Suppiluliuma I	1344-1322
Arnuwanda II	1322-1321
Mursili II	1321-1295
Muwatalli II	1295-1272
Urhi-Tesub	1272-1267
Hattusili II	1267-1237
Tudhaliya III	1237-1209
Arnuwanda III	1209-1207
Suppiluliuma II	1207-

Arnuwanda I became the sole king upon his father's death. From his reign, we gain more insight on religion, and how they primarily adopted religious elements from other traditions. He was then succeeded by his son, Tudhaliya II. The beginning of Tudhaliya II's reign was marked by political and economic turmoil and suffered from militaristic pressure by external groups, which suggests that Arnuwanda I faced discord at the end of his reign. This can also be seen in texts from tablets, in which he and his wife complain to the gods, about the Kaskian attacks from the north (Yazıcı 2011). Tudhaliya II and Tudhaliya III were sequential kings and it is often difficult to separate them apart since they ruled for a short period of time (Genz and Mielke 2011).

At the same time Tudhaliya II lost control of the Halys region, the Hittites were being intensely attacked by external forces on all sides. Hattusa, the capital, also fell out of Hittite control at this time, and Tudhaliya III was probably forced to relocate to Samuha, a neighboring city, since he was unable to regain control of Hattusa (Cimok 2010). After this, Tudhaliya III began to make small moves to regain control over the territories. Under his rule, the Hittite Empire lost control of the region and Arzawa, a neighboring state, became the main power in the region.

Suppiluliuma I then succeeded Tudhaliya III. Suppiluliuma I was an experienced soldier and skilled on the battlefield. As such, he regained many territories and cities. He was the first leader to allow local self-governance under them rather than giving power to other royal Hittite princes (Bryce 2011). In some cases, he gave the newly appointed leaders a bride from the royal Hittite family to secure allegiance. The campaigns of Suppiluliuma I led to tension between the Hittites and the Egyptians. Suppiluliuma ordered a military campaign, in which many Egyptians were taken captive as slaves. The captives ended up bringing a plague that resulted in the death of Suppiluliuma I, and his son and heir, Arnuwanda II, who only reigned for a short while (Cimok 2011).

Mursili II was the next king, and he attributed the plague to the crimes against Egypt, committed by his father, Suppiluliuma I. Mursili II initially neglected the campaigns that his father and brother had led in Syria and against Egypt, so he lost control over those regions and the territory was decreased. His reign was mainly dedicated to quelling rebellions, and maintaining control over the region, which his father had gained.

The next king was Muwatalli II, who inherited a relatively stable empire (Klengel 2011). Muwatalli II moved the capital to Tarhuntassa based on an omen he received, and left another

official in charge of Hattusa. The official, Mittannamuwa, was a friend of Muwatalli II's younger brother, Hattusili, and he would later play a role in Hattusili's power gain (Bryce 2011). Muwatalli II also allowed his brother to govern a portion of the empire, in his stead (Cimok 2011). Muwatalli II paid more attention to politics, the area around Hattusa, and western Anatolia. His lack of concern with the region bordering Egypt led to Egypt's regaining control over some cities there, including Kadesh during his reign.

Urhi-Tesub inherited the throne from his father, Muwatalli II. As a king, he took the name of Mursili III, and he moved the capital back to Hattusa. If Muwatalli II did not have a son, Hattusili II would have become king, which made their relationship tense. Mursili III struggled due to invasions, and Hattusili II was able to banish him by instigating a civil war in which he won (Apology of Hattusili III §11 (=COS 1.77:200)). Mursili III fled to Egypt, and joined the court of Ramses II. Hattusili II sought to settle the issues between the Hittites and Egypt. As a result, the Treaty of Kadesh was signed in 1259 B.C. To further the alliance, Hattusili II sent one of his daughters to become a bride of Ramses II.

Tudhaliya IV inherited the throne from his father, Hattusili II, and is often considered the last great Hittite king (Cimok 2011). Tudhaliya IV faced a lot of issues when he took the throne: many uprisings occurred throughout the empire, and he had to constantly put down rebellions. In addition to uprisings within the empire, Tudhaliya IV had to deal with constant external threats. His son, Arnuwanda III became the next king, but he faced a successful coup from Suppiluliuma II. Suppiluliuma II was the last Hittite king who attempted to stabilize the empire, and the fact that he had little political and militaristic control, led to both the possible evacuation of Hattusa, and the collapse of the empire around 1190 B.C. (Bryce 1998).

## Military Campaigns

Hittite society relied heavily on their military, which was extremely successful due to its innovative chariot tactics. The Hittites had one of the most successful militaries in the region, during the early Bronze Age. The Hittites maintained control over vast trade networks, and so they had access to a variety of resources. Because they relied on these resources to maintain their military and empire, they fought vehemently to establish control over pivotal regions.

As stated above, the New Kingdom period began with the reign of Tudhaliya I, and the co-reign of his son, Arnuwanda I. In order to halt Egyptian expansion, Tudhaliya I led campaigns to Kizzuwatna, and Syria (Klengel 2011). These campaigns were also an attempt to regain land that had been under Hittite control during the Old Kingdom (c.1650-1400 B.C.), and eventually regained control of Halpa and Carchemish (Yazıcı 2011). Tudhaliya I and Arnuwanda I led many successful campaigns to Assuwa, and the Land of Arzawa. Spoils from these campaigns included: “thousands of slaves, chariots, cattle and sheep” (Cimok 2011, pg 38). The empire itself expanded greatly with the added territory acquired from these campaigns. Once Arnuwanda I became the sole leader, not much is known about his military campaigns; however, it is known that he was pressured by the Kaskians.

Tudhaliya II/III was considered unsuccessful, because he lost control over many territories during his reign, and he failed to regain these territories before his death. The next king remedied the empire from this faltering period in Hittite history.

Suppiluliuma I, experienced on the battlefield, led many successful campaigns, in order to regain control of lost territories. He not only sought to regain the lost territory, but also lead numerous campaigns against Mitanni, a powerful state in the region. The Mitanni capital was eventually captured, and then destroyed along with the execution of the king (Klengel 2011).

Once Mitanni was destroyed, Suppiluliuma looked even further west, and continued his campaigns to expand the empire. He conquered many of Mitanni's allies, and the Hittite empire came to border Egypt. The Hittite capturing of Kadesh, which was allied with Egypt, inspired Egypt to lead an attack to retake the city, which resulted in Suppiluliuma retaliating with a "six-year campaign" in Syria (Cimok 2011).

Mursili II focused his efforts on leading campaigns against Arzawa, which had rebelled against the Hittites along with a few other territories (Cimok 2011). This campaign was relatively short and successful, but Northern Syria began to rebel when Mursili's brothers died. The campaign to reestablish control over Northern Syria took a great deal longer than his other campaigns in different regions, but it was also successful.

Initially, Muwatalli II was more concerned with controlling and maintaining the western portion of the Hittite Empire. After Egypt regained control of Kadesh, he began to refocus on that region. The infamous Battle of Kadesh took place during the reign of Muwatalli, around 1272 B.C.

Muwatalli II's son, Mursili III, was rather unsuccessful, and lost a great deal of territory in Northern Syria before being replaced by his uncle, Hattusili II. Hattusili II then established an alliance between the Hittites and Egyptian.

Tudhaliya III conducted military campaigns, in an attempt to put down numerous rebellions, which occurred all over the empire. Initially, he was successful in maintaining the empire, but eventually started to lose territory, through conflicts and rebellions that rose up throughout the land (Yazıcı 2011). Assyria also began to lead forces into Hittite territory, and Tudhaliya met the Assyrians in battle to maintain control. The Hittites ended up losing to the Assyrians. The later kings did little to maintain such a vast empire, and instead dealt with

constant threats, both internally and externally. This led to the downsizing of the empire as new powers rose up, and as territories, or cities became independent. The empire faced many conflicts, and eventually disappeared from record around 1190 B.C., which was also documented by the Egyptians (Bryce 1998).

### **The Demands of a Militaristic Empire**

The Hittites utilized a palace economy, in which every person labored to benefit the empire, and “The palace economy of the Late Bronze Age effectively centralized control of Anatolia’s resources even as it inexorably bound the inhabitants of the land who were dependent on those resources to the ruling house,” (Collins 2007, pg 112). It was important that everyone was actively working to maintain the empire, and support its endeavors.

The empire used taxes to provide a source of revenue for the government. One type of tax was the “sahhan tax.” which dealt with agricultural surpluses (Collins 2007). This tax considered the crop yield of each farm or person, determined how much was surplus, and that portion was given to the state. Tributes were also an important source of revenue, which was collected from Hittite controlled territories. Trade was also important for acquiring both luxury goods, and grain. The majority of the elite and members of the royal family desired luxury goods, and, oftentimes, they were acquired solely for use as diplomatic gifts.

Military campaigns were also important for providing the Hittites with goods. Military campaigns and conquest led primarily to the acquisition of people (slaves) and livestock. Slaves supplied manpower for the Hittites, and either worked on farms, or served in the military. Campaigns were often rather costly, and required large rations of primarily flour and bread, which would accompany the military (Beal 1986). They restocked their supplies at numerous

supply houses, which the empire kept well stocked for resupplying the military. The military would then need enough supplies to return with all of the people and livestock obtained after a successful campaign. The Hittites knew the campaigns were costly, but they believed the acquisition of manpower would offset the cost of supplying a military. Large campaigns often removed men from agricultural work to serve as soldiers, so new people would be thought of as replacements, which allowed for people to serve in the military, while the fields could still be worked.

### **The Decay of a Militaristic Empire**

The Hittite Empire faced many problems at the end of its existence, many of which became apparent during the reign of Tudhaliya III. The issues can be categorized under three primary groups: political, militaristic, and economic.

#### Political Struggle

Around the time that Tudhaliya III became king, many political issues occurred, such as the revolts close to the Hittite center of control (e.g. the revolt of Lalanda). The fact that revolts occurred close to the center of control suggests that the Hittite's power was weakening (Cimok 2011). Tarhuntassa, once the Hittite capital, had isolated itself into an independent kingdom. The proximity of the city itself was close to the Hittite center of power, which further supports the idea that the empire was deteriorating (Cimok 2011). After the coup of Arnuwanda III, led by Suppiluliuma II, there was a massive division in the royal families, which suggests that the king was under constant threat because of the political division. There was a constant argument, at the time, on which branch of the royal family had legitimate claim over the throne (Bryce

1998). This division began to greatly undermine the authority, and restrict the abilities of the kings, which represents the deterioration of the empire's power (Bryce 1998).

The empire itself also faced division between the territories, and local lords rose against the Hittites, and allied together to fight them (Yazıcı 2011). Threats came mostly from the Kaskians in the North, and the many different groups to the West. The rebellions were hard to control, and as such the Hittites lost control of land all across the empire.

The greater region as a whole was facing a great deal of threats at the time, and the sequence of these threats throughout the region were the result of “the collapse of the political structure of the time” (Cimok 2011, pg 59). Many of the powerful Hittite cities attempted to fortify themselves to prevent these troubles. The Hittites intensely fortified Hattusa and constructed more household structures in rundown districts, so more of the citizens could live behind the walls. As a result, Hattusa became more compact and fortress-like (Nossov 1996). Many people from smaller territories began to migrate further inland because of external threats from people such as the Kaskians, and the Sea Peoples.

### Failed Campaigning

Tudhaliya III was constantly putting down rebellions, and leading armies in defense of Hittite lands. A massive, humiliating defeat to the Assyrians ended up damaging the reputation of the Hittite military (Cimok 2011). From then on, the Hittite military constantly faced defeat, and had only minor successes in putting down rebellions. The age of warfare had shifted and adapted while the Hittites relied on past techniques and tactics since it had served them well in the past.



The disobedient local leaders (governors) from many of the revolting territories thought of themselves as being equal to the Hittites (Bryce 1998). They undermined the king, and in some cases ended up insulting the current king by refusing to acknowledge him. Most of these territories were in the west which led to the majority of the campaigns being in that region. It has been proposed that the reason for this was possibly to provide a buffer for other regions, in order to prevent the hostilities from spreading (Bryce 1998).

### Failing Economy and Agriculture

During Tudhaliya III's reign, there was an increase in the amount of grains that were being imported from Egypt which started under Hattusili II (Cimok 2011). The Hittites were suffering from successive, dry summers, which were even more severe because of the fact that most of the land under control was in high plateaus and caused a shortage in their crop yields. The dry summers caused a lack of water which had devastating effects on the crops and herds. The Hittite army contributed to decreased crop yields, as men were prevented from farm work, due to campaigns during the spring and fall. During the reign of Tudhaliya III, the Hittites were involved in constant warfare on all sides of the empire, making them more reliant on Egyptian grain (Cimok 2011).

Tarhuntassa, once the capital of the Hittites, became an independent territory near the end of the Hittite Empire. The city itself was close to Ura, the port city through which Egypt's grain came, via Ugarit to Hattusa. This made it important to control that region so the grain supply was not cut off. This importance led to a lot of conflicts between Tarhuntassa and the Hittites.

The migration of the people moving further west caused more people to settle around Hattusa, the center of the Hittite world. The capital then had to provide for more people, as well

as the campaigning army. The fact that the granaries at Hattusa were discovered mostly full is surprising, given the city was practically clean of any really valuable items.

## THE SITES

### Hattusa

Hattusa, as already stated, was the capital of the Hittites. Hattusa is also known as Boğazköy since that is what the city was known as early on in excavations. After many years of publishing work on the site of Boğazkoy it was finally discovered to actually be Hattusa, but by that time the site was well known by its new name and as such it is often referred to as Boğazkoy-Hattusa or either name individually (Figure 2). The site itself was discovered in 1906, when excavations began and is still being conducted by the German Archaeological Institute (Burney 2004). Excavations were halted for a long period of time due to the World Wars.



Figure 2. The sites examined. (Fairbairn and Omura 2005:Fig. 1).

Hattusa was an active city that was home to the royal family for the majority of the time, so the site itself was relatively large in comparison to other cities (Figure 3). The city has a history of being attacked by local enemies and as such as many periods of destruction that was then followed by a period of reconstruction. The city of Hattusa was eventually abandoned and was cleared out of almost all personal belongings (Bryce 1998). The residents packed up all of their belongings and evacuated the city. It is assumed that they evacuated out of fear of being attacked by Kaskians (the mountain people from the north). After the city was evacuated, the city was torched, presumably by the Kaskians (Collins 2007).

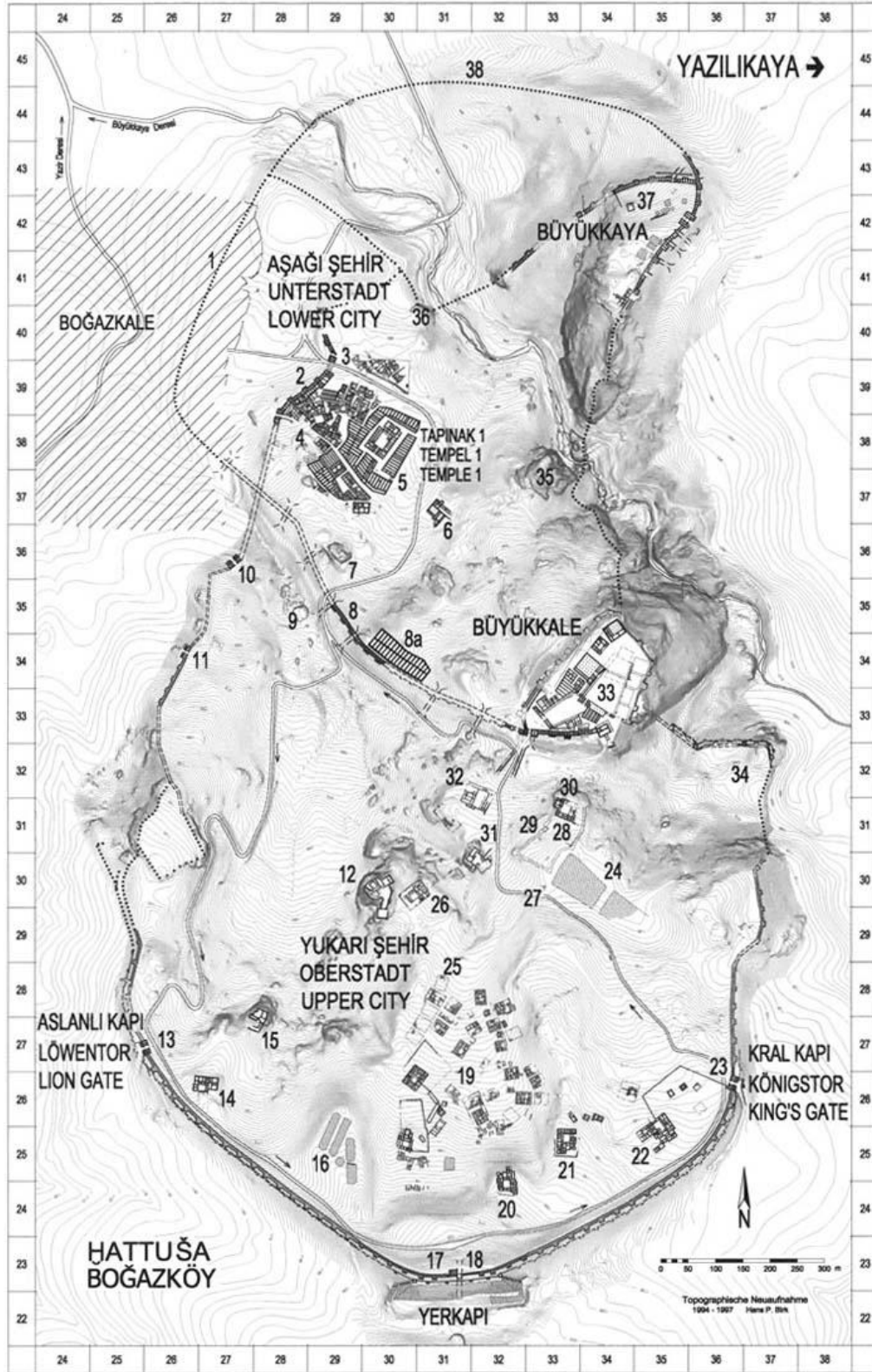


Figure 3. Plan of Hattusa. Courtesy of the Bogazköy-Archive, Deutsches Archäologisches Institut. (Bogazköy Expedition; drawing: H. Blink)

## **Kaman-Kalehöyük**

Kaman-Kalehöyük was a provincial settlement in the Hittite empire and its location can be seen in Figure 2 and Figure 4. It was located by the Japanese Institute of Anatolian Archaeology in 1985 and excavation began in 1986 and is still ongoing. At the site, four main cultural periods have been identified and for the purposes of this research I will be looking at Stratum IIIb-Stratum IIc since it spans the Hittite Old Kingdom and the early Iron Age. The site itself was known to have been an agricultural production site that included many storage facilities (Fairbairn and Omura 2005).



Figure 4. An Overview of Kaman-Kalehöyük in 2007 by K. Matsumura.

## **METHODOLOGY**

The focus of this research was to see the effects that a militaristic society has on the grain supply. The goal was to support the idea that military use of grain and its control was a crucial factor in the collapse of the Hittite civilization. Towards its end, the Hittite Empire faced numerous issues in which grain shortages was just one. In looking at the topic of food issues, there are three

primary categories that will be examined: trade with the Egyptians, food storage, and military support.

### **Historical Documentation**

The historical documentation that was analyzed consisted of ancient texts/documents in translation. The documents that were looked at are relevant to the time of the Hittite collapse (the New Kingdom), trade with the Egyptians (especially when they pertain to grain), the food shortages, external groups that the Hittites faced near the empire's collapse, and anything discussing the food supply that was required to support and maintain the active Hittite military.

The focus of this work was then used to look for archaeological data that can be linked to the documentation which pertained primarily to grain, trade, and the military. The fact that the research relied heavily on historical documentation was taken into consideration when examining some data such as numbers, when listing amounts for how much grain was traded or how many people were involved in campaigns. While the research assumes that most numbers are fairly accurate, it also views the numbers as a suggestion rather than a fact because of the use of propaganda in campaigns. Archaeological data will be linked with the documentation in order to lend credence to historical accounts.

### **Granaries and Storage Pits: Botanical and Faunal Remains**

The archaeological data that the research looked primarily at was grain and its storage along with faunal remains. Hattusa and Kaman-Kalehöyük, sites which feature granaries and storage pits, and have been excavated have been analyzed to lend credibility to historical documentation on topics such as trade, control over the grain supply, and food sources/diet. The two sites are

representative of the range in sites which contain granaries and storage pits because one is the capital of the Hittites, while the other was a relatively small provincial settlement. Excavation data from these two sites were primarily looked at when it pertained to subsistence goods, and in initially with a focus on botanical remains. Faunal remains became more important as the data was analyzed and it was determined that the faunal remains were important for this topic.

Excavations at the two sites, Hattusa and Kaman-Kalehöyük are the focus of the research. By looking at the grain storages at Hattusa and Kaman-Kalehöyük, insight has been provided on how grain supply impacted the empire especially near its collapse. Grain supply impacted the empire because of its need for regulation and distribution especially when it comes to supporting provincial settlements and military campaigns. The lack of grain supply then can be connected to the increase in faunal remains closer to the collapse point of the empire. The research itself can make connections to how and why the empire collapsed when it did.

In addition to looking at the capital, storage pits at Kaman-Kalehöyük, located along a known Hittite military road, will also be analyzed. These storage pits will help identify the amount of food that was required to support and maintain the military, as it was campaigning. This can then be applied to other provincial settlements along military routes in other directions, in order to see how much subsistence goods, primarily grain, were being used to both restock the military while it was on campaign and keep the supply houses well stocked.

The last element in this category is the analysis on subsistence goods. Both Hattusa and Kaman-Kalehöyük have both botanical and faunal remains categorized in depth that were found at the two sites. The faunal remains that have been addressed in this research are those of wild animals which were slaughtered for most likely meat consumption. The two sites have drastically different quantities of animals which will be used to differentiate the subsistence

patterns between the capital and a provincial settlement. As for the botanical remains, they will be the primary focus when it comes to subsistence goods. The botanical remains at the two sites have been thoroughly catalogued. Botanical analysis at Kaman-Kalehöyük has been performed by the Japanese Institute of Anatolian Archaeology. This site has been excavated methodically when it comes to subsistence materials, making it an ideal site to look at for this research. A great deal of botanical analysis has also been conducted by the German Archaeological Institute at the site of Hattusa, which has good preservation due to carbonization of the subsistence goods since a fire devastated the city around the time of the empire's collapse. Since there was carbon, dates have been provided for when the fire potentially occurred. This can then be linked to historical documentation which addresses the external forces that were actively pressuring the Hittites during the time of its abandonment and fire. Botanical analysis is also used to show the similarities and differences on the grain contents so a comparative study can be conducted between two drastically different sites. A comparative study will also look at how the Hittites maintained control over subsistence goods through distribution to provincial settlements and how the resources were used to support the population and military.

### **Trade Goods and Exotics**

Trade goods and exotics have also been analyzed from excavation and survey data. These databases were acquired from the institutions that are actively working at both Hattusa and Kaman-Kalehöyük. By using the same locations, grain storage and artifacts can be archaeologically linked to certain time periods and can reflect different periods of kingship and as such, conquest and periods of increased trade with Egypt.



The trade goods and exotics will help establish connections on when trade networks were actively being used. They can also date when the trading ended based on the lack of new trade goods in the archaeological record. By looking at trade goods, tentative dates can be determined for when trade began and when it began to decrease between the Egyptians and the Hittites. Exotics and various other trade goods were also known to have been imported from Egypt, so their appearance could also substantiate when trading took place between the two.

## **Analysis**

Each of the three categories will be approached independently, but their results are analyzed in relation to each other. The research relies on historical documentation and its correlating archaeological data to suggest that the grain supply and its storage were pivotal to the collapse of the Hittite empire. The sites selected will help make connections to the collapse of the civilization since Hattusa was the capital and appears to have been abandoned even after being heavily fortified only a short time before. The artifacts that will be looked at will potentially help date when things occurred, and when things began to change, for the Hittites.

These analyses have been conducted to look at the connections between the categories, as well as individually. They aid in suggesting how accurate historical documentation was, at the time, amongst the Hittites. Changes overtime have also been looked at to see what was occurring before the collapse, and how it changed from when the empire was successful. The entire New Kingdom period will be analyzed, because there were periods of stability, as well as the actual empire collapse.

## **RESULTS OF HISTORICAL DOCUMENTATION**

Documentation is one of the primary sources utilized in this research to make connections between the importance of subsistence goods, primarily grain, and its use in the Hittite empire. Grain was vital for supplying the military campaigns and as such the acquisition of grain through trade networks was of great importance. Because of this, the focus of historical documentation is on those which pertain to the military, agriculture, and trade.

### **Military Documents**

Based on historical documentation, the Hittites had an army that was supported by the government (Beal 1992). This indicates that the Hittites had a warrior class where individuals specialized in warfare and as such spent their time campaigning or training (as suggested by historical documentation) (KBo 3.34 (=BoTU 12A) ii 21-35). This class then relied on the Hittite population to provide them with goods that they were unable to produce themselves, such as cloth, weapons, and food. In times of need, the Hittites could draft members of the population to take part in campaigns and during this time, those individuals would also be supported by the government (Beal 1992).

Other military documents discuss the provisioning of the Hittite army such as an instruction document that states, “from now on, this is the rule regarding army rations: ‘When they mobilize the troops for a campaign, let each Overseer of Clans(-men) and DUGUD scrutinize his own (troops’) [...], his (troops’) soldier-bread and his (troops’) flour” (KBo 16.25 (= CTH 251) i 30-32). In other words, “each unit carried bread, flour and perhaps some other food or drink” while on campaign (Beal 1986:689). Soldier-bread is believed to be a simple type of bread that is made from barley. The military was ordered not to hunt or forage on Hittite

lands, so the government was required to have “seal house cities of fodder” that would have been able to resupply the military with food while on campaign (KBo 3.1 (= BoTU 23A iii 34-42) iii 35-43). The majority of the food supply was presumably provided through revenue taxes or the sahhan tax (Beal 1992; Collins 2007).

Other military documents, such as the royal annals narrated the campaigns of the king. These annals were heavily based on the military and documented the victories, which cities were destroyed, and also listed all of the loot that was acquired from the campaigns (Collins 2007). Many campaigns appeared to have been foraging expeditions since the majority of the documented loot was cattle, grain, and wine (Beal 1992; KUB 26.71 iv 11-16; KUB 14.15 i 11-12; KBo 3.60 (=CTH 17.1) iii 12; KBo 5.8 i 38-40).

### **Agriculture Documents**

The Hittite economy was based primarily on small-scale farming (Collins 2007). Many landholders in the Hittite Empire were granted lands with cultivable land. They were granted these lands as gifts because of their services to the empire. In some cases, the lands were leased by wealthy individuals. The landholders were then expected to maximize the output of subsistence goods and if they were deemed lacking then they suffered the possibility of losing their land (Bryce 2011). There are numerous land grants that have been translated from the Hittite empire which demand this maximization of resource output to help maintain the population (CTH 151-210). The crops that were grown are even assumed to have been decreed by the leaders (Dörfler et al 2011).

There are historical documents that record the taxes based on agricultural surpluses. These taxes are known as the sahhan tax (Collins 2007). These taxes were heavily documented

by the Hittites because of its importance in the economy and the fact that this tax provided the majority of the food supply for the population. The taxes themselves gave the agricultural surplus to the palace, where it was then sent to various other places, such as the granaries at Büyükkaya in Hattusa.

## **Trade Documents**

The Hittites relied on trade near its collapse, but before the alliance with Egypt the Hittites relied more on tribute and loot since they had a palace economy. Both tribute and loot consisted of objects made from precious materials, livestock, and prisoners. The prisoners were used to fill positions in the military as well as to settle less populated areas to be able to work in agriculture. These prisoners were important in the Hittite economy since the Hittites were generally lacking in manpower (Collins 2007).

There is documentation of trade between Karkamis and Ugarit where slaves and horses from Karkamis were traded for linen garments, oil, dyed wool, lead, copper and bronze objects, and *alun*-stone (Singer 1999). Trade itself in the region was fairly dangerous because of the high amount of piracy in the region, but there were some safe port cities for trade via water routes such as Ura (Collins 2007). Merchants themselves were heavily protected by Hittite laws which can be seen in the law dealing with a murdered merchant, where the murderer was fined four thousand shekels of silver (Roth 1995). Towns were even fined if they allowed the murderer to get away.

The Treaty of Kadesh is also highly important since it established an alliance between the Hittites and the Egyptians. Before this, they were rivals in the region and often competed over territory. The treaty itself encouraged each side to aid the other in times of need. This was

eventually utilized by the Hittites in their need for grain. The treaty required that the Egyptians aid the Hittites during their time in struggle. There were various documents that reference the importance of Egyptian grain and how the Hittite population relied on it (Bryce 1998). The Egyptian pharaoh, Merneptah, had an inscription made at Karnak, referring to his shipments of grain to the Hittites stating that it was to “keep alive the land of Hatti” (Breasted 1906:Vol 3, §580).

## **RESULTS OF DATA ANALYSIS**

### **Granaries and Storage Pits**

Hattusa has many storage facilities that have been found within the past twenty years. There was an underground storage complex found in Hattusa that dates to the Old Kingdom period. This storage complex was able to hold an estimated nine thousand cubic meters of grain, which was primarily barley (Neef 2001). This quantity was capable of feeding around thirty thousand people for a year (Seeher 2006).

In 1996, the German Institute of Archaeology discovered Büyükkaya, which was another storage facility (Figure 5). Büyükkaya contained numerous underground silos that dated to the 13<sup>th</sup> century B.C. (Collins 2007). One of these silos was capable of holding 260 tons worth of grain by itself.



Figure 5. Reconstruction drawing of the silo pits at Büyükkaya.  
(Boğazköy Expedition; drawing: U. Betin)

Büyükkaya consisted of eleven large, fairly rectangular silo pits (Seeher 2000). While only eleven have been discovered, there is likely to have been more silo pits. These pits are generally 12 by 18 meters and 2 meters deep. Büyükkaya shows evidence for increased fortification near the collapse of the Hittite empire which suggests that the Hittites were trying to better protect their food sources.

There were a variety of storage units used by the Hittites as can be seen in Figure 6. The majority of the storage units that has been examined in this study are that of the silo pits as seen in drawing 2 of Figure 6. The storage units found at Kaman-Kalehöyük include a variety in sizes of silo pits (Fairbairn and Omura 2005). The silo pits found at Kaman-Kalehöyük can be associated with ÉSAG from historic documents. These particular storage units were used to supply the military and the population during stressful periods (Mielke 2011).

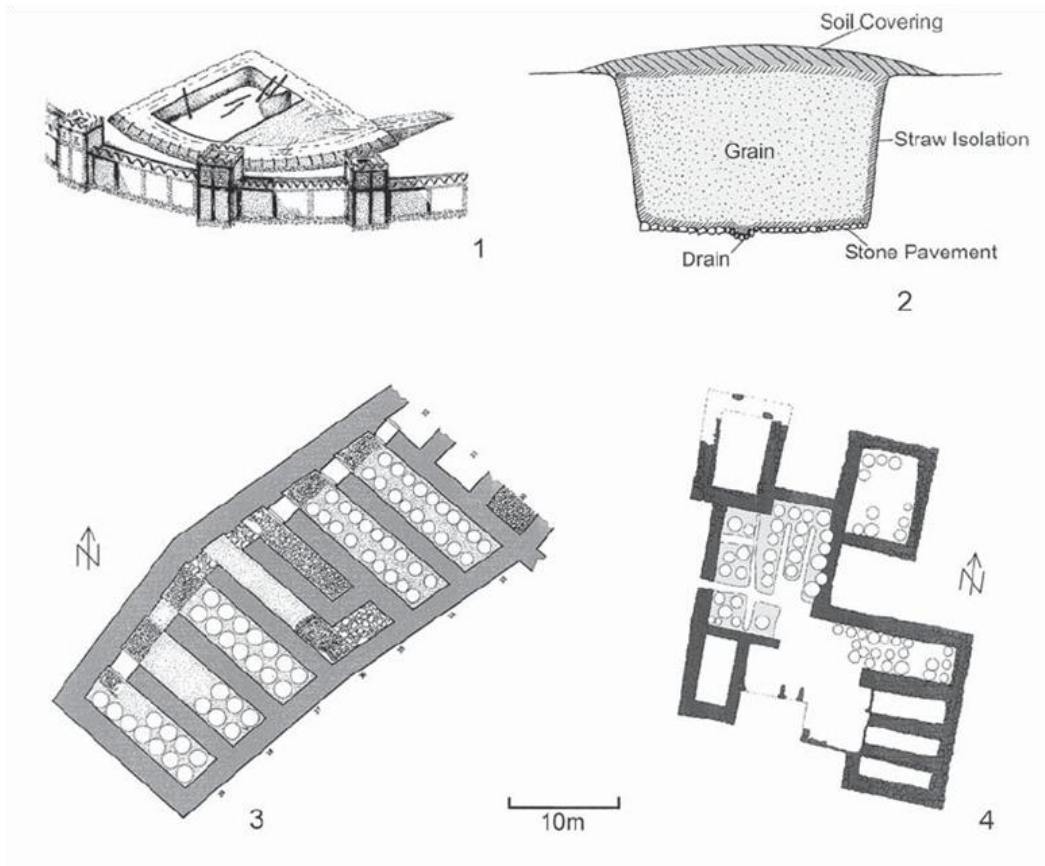


Figure 6. Storage facilities: (1) Kuşaklı, reconstruction drawing of the granary at the south point (Kuşaklı Expedition; drawing: M. Ober); (2) Boğazköy, ideal drawing of a silo pit (drawing: D.P. Mielke); (3) Boğazköy, magazine rooms with pithoi in the lower city (after Neve 1969, Abb. 3); (4) Ortaköy, Building B, magazine with pithoi installations (after M. Süel 2001, 681). (Mielke 2011:Fig. 8)

The large pits found at Kaman-Kalehöyük were greater than 7 meters in diameter (Fairbarin and Omura 2005). These pits contained archaeological remains of cereal products, primarily barley or bread wheat as well as the less important crops of einkorn wheat and chickpea (Nesbitt 1993; Fairbairn 2002; 2003; 2004).

## **Faunal Remains**

The Hittites relied on animals when it came to the economy. The domesticated animals in the Hittite empire consisted of horses, mules, donkeys, cattle, sheep, goats, pigs and dogs but not many were slaughtered for meat (Dörfler et al 2011). The majority of the sheep were used in rituals, whereas the other animals served other purposes. Historical documentation suggests that members of the elite had control over a large amount of animals, such as a list on Suppiluliuma's property which consisted of 10 cattle, 105 sheep and goats, two horses and three mules. Hittite laws can also be analyzed to support the fact that the domesticated animals were used for working fields, providing wool, and for various other sources of income.

Hunting was a source for some wild game, but the sport itself was generally only conducted by the royalty and politicians. The game that was acquired was generally small in quantity, so it did not greatly impact the diet of the Hittites. Even though the wild game did not have a drastic impact on the diet, they were still identified in the diet to a small degree which can be seen in Table 2.



Table 2. Wild mammals and birds recorded in the different Hittite sites.  
(Dörfler et al 2011:Fig. 7). *Adapted.*

	Species	Büyükkaya	Hattusa (Old Kingdom)	Hattusa (New Kingdom)	Kaman-Kalehöyük
	Total no. Identified (Mammals and Birds)	5037	519	7260	1845
<b>Mammals</b>	Red Deer	43	50	298	7
	Roe Deer	-	-	1	-
	Aurochs	-	2	17	-
	Wild Sheep	2	3	27	-
	Wild Goat	1	-	-	-
	Wild Boar	12	10	89	-
	Wolf	-	-	1	-
	Red Fox	2	-	5	7
	Brown Bear	-	-	3	-
	Badger	-	-	1	-
	Weasel	-	10	1	2
	Lion	-	-	4	-
	Leopard	1	-	4	-
	Lynx	2	-	-	-
	Wildcat	1	-	-	-
	Hare	16	1	59	14
<b>Birds</b>	Ruddy Shelduck	-	-	1	-
	Mallard	-	-	-	2
	Wigeon	-	-	-	2
	Shoveler	-	-	1	-
	Teal	-	-	2	-
	Anas sp.	-	-	5	-
	Ferrugineous Duck	-	-	1	-
	Aquila sp.	-	-	1	-
	Black Vulture	1	-	-	-
	Egyptian Vulture	-	-	-	1
	Chukar	1	1	-	-
	Crane	-	-	2	-

Based on the numbers seen in Table 2 and taking the time span of occupation into consideration, wild game was not of great importance to the Hittites. There is also a noticeable difference in the quantities of faunal remains found at the capital than at a provincial settlement. This suggests that Hattusa had greater control and access to more variety in food. Thus, suggesting that it was a center for redistribution of subsistence goods. There is also a shift in the

focus on meat food sources between the Old and the New Kingdom periods for the Hittites.

Reliance increased later on when the Hittites were forced to look for extra food sources (Figure 7).

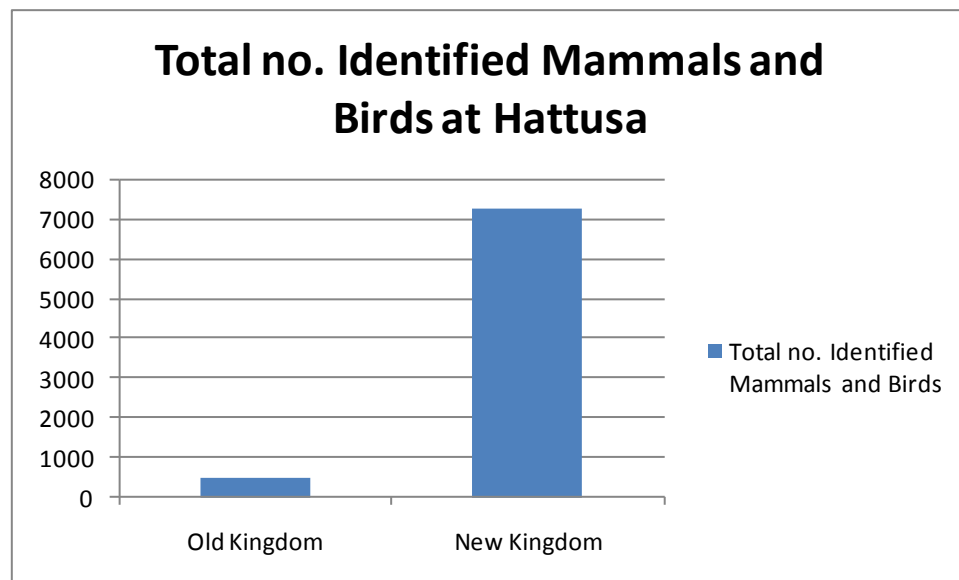


Figure 7. The total number of identified mammals and birds at Hattusa, in the two different periods.

### **Botanical Remains**

Cereal production was pivotal for supporting the Hittite population, so barley and different species of wheat were highly prevalent in the botanical remains at numerous Hittite sites. Barley was the base of Hittite nutrition because it was easy to grow in the worst of conditions (Dörfler et al 2011). The barley itself was used in breads as well as beer. Barley was also easily prepared and as such it was a form of instant food that aided the military in being highly mobile. This increased the demand for producing barley even more so especially when other forms of wheat would have been more productive if the crop was successful. There is a wide variety of different

types of wheat because the Hittites allowed conquered territories to continue local agrarian practices, which produced a wide variety of wheat that would then be redistributed throughout the Hittite Empire.

### Hattusa

As stated above, barley was virtually the staple crop for the Hittites because of its resistance to poor growing conditions. Its prevalence can be seen in the high quantities of the barley found at Hattusa which can be seen in Table 3. There were a variety of different types of wheat found at Hattusa which suggests that Hattusa was a redistribution center for the grains.

Table 3. Plant macro-remains from Hattusa.  
1 = rare finds, 2 = occasional finds, 3 = regular finds, 4 = dominant species  
(Dörfler et al 2011:Fig. 3). *Adapted*.

	<b>Plant Remains</b>	<b>Hattusa</b>
<b>Cereals</b>	Einkorn wheat	4
	Emmer wheat	2
	Bread/Hard wheat	3
	Barley	4
<b>Pulses</b>	Lentil	1
	Bitter vetch	1
	Grass pea	2
	Pea	1
<b>Oil-/Fibre plants</b>	Flax	1
<b>Fruit/Nuts</b>	Grape Vine	1
	Hazel	1
	Fig	1

## Kaman-Kalehöyük

This city was an agricultural production center, and as stated above the main crops were barley and bread wheat with secondary crops of einkorn wheat and chickpea. There have been numerous flotation samples taken from the site at different periods to show the variation in the botanical remains (Table 4). In these examples IIIb is the Old Kingdom period, while IId marks the collapse of the Hittite empire. These two time periods can show the variation between the Hittite rise to power and then its eventual collapse. Table 5 shows that change in crops that were relied on, as well as the frequency in which each type of plant was found in the total amount of samples from the given period. This shows that there was a decrease in amount of crops that were important to the Hittites.

Table 4. Plant taxa recorded in samples.  
1 = rare, 2 = occasional, 3 = frequent, 4 = abundant  
(Fairbairn 2005:Table 1 and Fairbairn, Longford and Griffin 2006:Table 1). *Adapted.*

	Flotation no.	2005/012	2005/019	2005/024	2005/028	2006/010	2006/011	2006/014	2006/017	2006/056
Cereal Crops	Kaman Phase	III b	III b	III b	III b	II	II	II	II	II
Cultivated Barley	(Grain)	1	-	-	2	3	2	2	2	-
Cultivated Barley	(Rachis internode)	-	-	-	-	2	1	1	-	-
Free-threshing Wheat	(Grain)	2	-	1	3	2	2	-	2	2
Free-threshing Wheat	(Rachis internode)	-	-	-	-	-	2	-	-	-
Einkorn Wheat	(Grain)	-	-	-	2	-	-	-	-	2
Einkorn Wheat	(Spikelet fork)	-	-	-	2	-	-	-	-	-
Einkorn Wheat (variation)	(Spikelet fork)	2	-	-	1	-	-	-	-	-
Cereal Indeterminate	(Grain)	-	1	1	-	-	-	-	-	-
Cereal Indeterminate	(Awns)	3	-	-	-	-	-	-	-	-

Table 5. Presence and ubiquity scores for economic plant types found at Kaman-Kalehöyük by site occupation phase;  $\Sigma$  = number of samples in which plant present;

Ub = Ubiquity (% presence) for each site phase

(Fairbairn 2005:Table 3). *Adapted.*

Site Phase/No. economic plants	IIIb	9	IId	5
Sample Sum ( $\Sigma$ )	18		2	
Economic plants	$\Sigma$	Ub	$\Sigma$	Ub
Hulled barley	13	72.2	2	100.0
Free-threshing wheat	15	83.3	2	100.0
Glume wheat	9	50.0	1	50.0
Bitter betch	9	50.0	1	50.0
Lentil	1	5.6		
Chickpea	1	5.6		
Pea	1	5.6		
Flax	2	11.1		
Grape	5	27.8	1	50.0

### Trade Goods and Exotics

Hattusa was abandoned and lacked in presence most types of trade goods. Meanwhile, Kaman-Kalehöyük had not been abandoned, but no artifacts really appear to be from trade or as exotics because they were from outside of the Hittite mainland and relatively uncommon. The data that is available that can be associated with trade goods and exotics are apparent through the wild game (Table 2). This table displays some of the exotic animals that were found at Hattusa such as the lions and leopards. Both of these animals were not common to the region of Hittite primary control and they appear to be relatively common. These animals are presumably gifts from Egypt since they were more common in Egypt even though they were possibly uncommon in Egypt.

## CONCLUSION

The Hittites faced many problems in the last one hundred years of its existence. This is fairly obvious based on archaeological remains and extensively through historical documentation, some of which listed the casualties of the period which included the Hittites. The issues that the Hittites dealt with ranged from issues in political succession, failed campaigning, failed suppression of rebellions, loss of trade networks, and a succession of poor crop yields.

Documentation suggests that the Hittite crops were failing because of consecutive dry summers. With the poor crop productions, the farms probably all shifted to production of barley in attempts to at least have some output since wheat required better conditions while barley was more resistant and capable of surviving in poor conditions. The fact that documentation still states that the Hittite crops were failing, it can be assumed that the barley crops were also producing a great deal less than in previous years.

This leads to the Hittite reliance on Egyptian grain. The Hittites heavily relied on cereal grains as their primary food source. With their failing crops, they had to look for the grains elsewhere. Since the Treaty of Kadesh established a friendship between the Egyptians and the Hittites, the Hittites requested aid in the form of grain. There are numerous historical documents that address this trading relationship between the two. The Egyptians even knew that their grain was important for the survival of the Hittites. Eventually the trade routes between the two were cut off due to external forces and uprisings. External groups such as the Sea Peoples probably raided the majority of the coastal towns and as such, water routes were cut off. Land routes became difficult to cross because of rebellions throughout the Hittite empire. Thus, trade between the two abruptly came to a halt.

In this situation, the Hittites were forced to look for other food sources such as increasing game consumption in later periods. This can be seen at the site of Hattusa where the presence of wild game increased dramatically in later periods. The fact that the empire was downsizing due to rebellions and from attacks by external groups, the population was condensing more in specific areas. The areas that the Hittite population was fleeing to were heavily fortified settlements such as Hattusa, which shows evidence of increased fortification at later periods. This indicates that people were fearful of external attacks and tried to protect themselves as much as possible within the central region of the Hittite power. Since the cities were experiencing an influx in population, they felt even more pressured to find enough food sources to provide for everyone. In the end, the wild game was not able to sustain the increased population of Hattusa which was also attempting to feed the active military.

Throughout these struggles that the Hittites faced, the military was still actively campaigning and attempting to regain control over regions that rebelled. These campaigns were generally met with embarrassing results for the Hittites. Even though they were facing defeat after defeat, they still continued to campaign in an attempt to regain a foothold in the overall region. Since the military was actively campaigning, the Hittite cities were, for the most part, left undefended. The defenses that the larger cities maintained were certainly incapable of defending against a serious threat. Eventually the Hittite cities were abandoned and as seen in the case of Hattusa, the city was later torched by presumably, the Kaskians. It can be interpreted that the site of Hattusa felt threatened without the military to protect them, since the military was campaigning and the population as a whole could have panicked. The population probably did panic because they were running out of options for food sources; their food supply was probably

running low or at least it was heavily restricted by the political administration; and the threat of external attacks was present.

In conclusion, the Hittite military caused an economic crisis by constantly demanding more subsistence goods than what could be acquired. Maintaining trade networks to meet the demands was pivotal, but with uprisings the trade networks virtually collapsed and as such, the demands for cereal products were not met. The Hittites potentially counteracted this by looking for other food sources (wild game), but this was not able to replace the cereal products. Within a short amount of time after losing control of the trade networks, the empire collapsed. As such, the economic impact of the Hittite military and its militaristic society was devastating for the empire.

### **Future Work to be Done**

There is large amount of work that can still be done. Other sites can now be analyzed to see if these trends appear elsewhere. Expanding the amount of analysis at the site of Kaman-Kalehöyük itself, could further increase this by providing more data to look at rather than rely on a few samples. Kaman-Kalehöyük is also lacking in data from the actual period of the New Kingdom, so other sites could potentially fill in that gap. Overall, further research and further excavation can only aid in the better understanding of the agriculture and economy of the Hittites throughout the Old Kingdom and New Kingdom, all the way to the point of collapse.



## ABBREVIATIONS

BoTU E. Forrer, Die Boghazköi-Texte in Umschrift = WVDOG 41, 42. Berlin, 1922-1926.

COS Theo van den Hout (translator), *Context of Scripture*. Edited by William W. Hallo. 3 vols. Leiden: Brill, 1997.

CTH Emmanuel Laroche, *Catalogue des texts Hittites*. Paris: Klincksieck, 1971.

KBo Keilschrifttexte aus Boghazköi. Berlin, Gebr. Mann, 1916-.

KUB Keilschrifturkunden aus Boghazköi. 60 vols. Berlin, Akademie Verlag, 1921-1990.

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