Water management and its judicial contexts in ancient Greece: a review from the earliest times to the Roman period

Jens Krasilnikoffa,*, and Andreas N. Angelakisb

aDepartment of History and Classical Studies, School of Culture and Society, Aarhus University, 8000 Aarhus C, Denmark
bHellenic Union of Municipal Enterprises for Water Supply and Sewerage, 41222 Larissa, Greece

Abstract

From the earliest times, Greek societies prepared legislation to solve disputes, define access to the water resources, and regulate waste- and storm-water disposal. On the one hand, evidence suggests that in Greek antiquity (750–30 BC), scientific progress was an important agent in the development of water management in some cities including institutional and regulatory issues. In most cities, it seems not to have been a prerequisite in relation to basic agricultural or household requirements. Previous studies suggest that judicial insight rather than practical knowledge of water management became a vital part of how socio-political and religious organizations dealing with water management functioned. The evidence indicates an interest in institutional matters, but in some instances also in the day-to-day handling of water issues. Thus, the aim of this review is to follow the development of water law and institutions and their technical solutions in the Greek states during the Archaic through the Roman periods. In addition, it demonstrates that the need for water management regulations is not a modern creation, but there is a long tradition of solving complex issues of water supply and use with rather sophisticated legal measures.

Keywords: Irrigation; Laodicea; Magistrates and superintendents of water; The law code of Gortyn; The laws of Solon; Water codes

Introduction

Ancient environmental legislations from Mesopotamia to Greece

Scholars have repeatedly pondered the possibility that some of the water management knowhow that emerged in the Greek Bronze Age and in the Archaic and Classical periods is of a Mesopotamian origin (e.g., Chatelain, 2001). Undoubtedly, Greeks visited the Levant, Egypt, and the heartlands of Sumerian


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and Babylonian civilizations, but it remains a crux to determine whether the development of a Greek judicial practice concerning the handling of water issues is of a Mesopotamian origin.

Sumerians established the first known laws, which mainly focused on social and economic aspects, as they contained rules for proper compensation for damage done to others or their property. The laws of Ur-Nammu (c.2112–2085 BC) mandated compensation in silver for taking out a man’s eye, and the code of Lipit-Ishtar (c.1934–1924 BC) set a negligence standard for property damage to houses. The Sumerian city-state of Eshnunna developed a legal code (c.1900 BC) that expanded upon the principles of compensation for damage done to others, addressing conflicts over sunken boats, goring oxen, biting dogs, and collapsing walls (Goetze, 1951–1952). It is, however, not entirely clear whether this involved types of damage caused by someone failing to maintain water works or discharging wastewater onto neighboring property.

The earliest regulations explicitly related to water management and especially irrigation, however, date back to the era of the Babylonian King Hammurabi (c.1792–1750 BC). Hammurabi had several laws listed pertaining to irrigation, possible negligence of irrigation systems, and water theft (Hatami & Gleick, 1994). Based on previous Sumerian laws, Hammurabi created his own code of laws, which consisted of 282 regulations and was enforced throughout his kingdom (Breasted, 2003), and supposedly ensured farmers’ participation in the construction of infrastructure and a fair distribution of water to avoid conflicts. This early code covered: (a) distribution of water proportionally based on acres farmed; (b) the farmers’ responsibilities in maintaining canals on their property; and (c) water apportionment and policy on irrigation arrangements as a collective responsibility of beneficiary farmers (Harper, 1904; Richardson, 2004). These concepts constituted the foundation of irrigation in the region, and although some of them were neglected during certain periods, new policy in many countries mirrors these principles as a feasible way of ensuring good management through farmers’ participation. It is disputed among legal historians whether early Greek law was inspired by these early Mesopotamian examples. Moreover, it is disputed whether a ‘unity of Greek law’ developed sometime during the Archaic period – i.e., whether early Greek poleis (city-states) developed a uniform judicial response to solving conflicts. Rather, when we look at the part of the legislation devoted to regulating various forms of water management, it seems as if the poleis of the Archaic and Classical periods created ad hoc solutions to acute problems regarding access to water resources and disposal of waste- and storm-water.

The first laws and indications of an established court system in the Greek world emerged in Crete during the Archaic age (Gagarin, 1986), and the diversity in the way different Greek societies chose to create their judicial systems was apparent from early on. The first legal inscription from Dreros in Crete dates to the middle or second half of the 7th century BC. The inscription explicitly states that polis enacted the regulations, which was almost certainly new, although it may originate from older oral judicial tradition. In Classical Athens during the democratic period (c.507–322 BC), the ‘people’s courts’ supposedly developed their vital elements beginning with the reforms of Solon (594 BC), and were further adjusted and expanded during the democratic reforms of Cleisthenes (c.508/7 BC). Throughout the Classical period from Cleisthenes to the death of Alexander the Great, however, the Athenians continued to rethink their judicial system (Hansen, 1991) and this was reflected in the water legislation as well (Koerner, 1974).

The ancient Greeks had no official punishments or laws after the early Dark Ages. Presumably, in Iron Age societies, capital offences would often result in endless blood feuds, and the Greeks did not begin to publish laws on stone slabs (stelai) until the middle of the 7th century BC. Aristotle informed in his The Athenian Constitution that the lawgiver Draco wrote the first Athenian laws handed down to
us in c.621–620 BC. According to this law, death was the punishment for willful homicide and exile for involuntary homicide. This law was the only one of Draco’s laws maintained in 594 BC, when the Archon Solon, an appointed lawgiver, revised the Athenian law corpus. Allegedly, as the new lawgiver, Solon created a variety of laws that fitted into the four ancient Greek law categories (Aristotle, *The Athenian Constitution*, c.350 BC; Stroud, 1968).

Solon reformed the so-called ‘Draconian Constitution’ and according to later traditions, he introduced the principle of sharing the limited water resources of Attica for the benefit of those farmers in need of water (Plutarch, *Solon* 23.4). In addition, from the 7th century onwards, the civic governments of the Greek city-states published laws as inscriptions on stelae in order to solve and prevent disputes between citizens. Thus, from an early date, water management and its many different complications had the attention of the civic authorities. In addition to different types of injury laws, Solon also wrote laws for the placement of houses, ditches, and wells (Aristotle, *The Athenian Constitution*). We hear of no legal disputes over water rights from the Spartan context, however. Expert colleagues and, in particular, the Laconia survey suggest that the Spartan economy rested on the relatively fertile and well-watered nature of the Laconian heartland and subdued Messenia (Cartledge, 1979; Cavanagh et al., 2002).

A few examples involving human interaction with the natural environment survive from the 4th century Athenian forensic evidence. Most of these, however, are primarily concerned with religious issues. Thus, the trail against one Athenian citizen for cutting down an olive trunk sacred to Athena deals with a possible case of *asebeia* – ‘ungodliness’ – not an example of protecting the environment (Lysias 7. 3, 32, 41; also Demosthenes 43, 71 on the cutting of any olive tree in Attica; Isager & Skydsgaard, 1992). Moreover, additional locations were sacred to specific Gods of the Athenian pantheon (Hughes, 1994). One such example was the *Hiera Orgas* at the border between Athens and the neighboring city-state Megara. Here, a sacred precinct for the Goddesses Demeter and her daughter Kore (Persephone) gave rise to quarrels between the two city-states prior to the Peloponnesian War (431–404 BC). Among the complaints raised at the outbreak of the Peloponnesian War, the Athenians accused the Megarians for cultivating the precinct, which was to be left untouched. In the 4th century BC, quarrels over the precinct triggered yet another controversy between two Athenian factions on whether to leave the precinct uncultivated or to commence cultivation (Rhodes & Osborne, 2003, no. 58).

In the Roman period, a special reference to the protection of the environment was included in Julius Pollux *Onomasticon* (7. 146. 1–4), presumably dealing with the Athenian context:

‘*Do not burn, or subtract their stems, or saw, or cut the grove, nor subtract wood or stripped branches (i.e. trees); if anyone is arrested for cutting from the grove, he is punished with fifty lashes.’*

This paper intends to show that the study of the environment and its judicial contexts focusing on water management issues in ancient Greece may be useful for understanding the historical roots of our modern water resources legislation. The development of institutions and regulations on issues concerning water management in the urban and rural areas (i.e., *poleis*) of the Archaic through the Classical, Hellenistic, and Roman periods are considered. These judicial contexts represent the beginnings of a conscious development of water resource legislation, whose key elements remained relevant throughout European history – and the best proof that *the past is the key to the future.*
Prehistoric Greece

There is next to no relevant information on the development of water management and its judicial implications from prehistoric Greece. Early prehistoric civilizations flourished in plain areas close to rivers, where water for agricultural development was readily available (e.g., Mesopotamians near the rivers Tigris and Euphrates in Asia, Egyptians near the Nile in Africa, Indians near the Indus River, and Chinese civilizations near the Yellow and Yangtze River basins). On the contrary, but with the exception of the Minyan culture at Gla, by Lake Kopais in central Greece, the majority of the earliest Greek societies avoided the establishment of their major urban centers close to rivers, lakes, or rich springs (Angelakis et al., 2016). Close observation of the locations of these centers suggests that the ancient Greeks chose to establish most of them in the driest areas (Figure 1). The exact reasons for this are not clear, but we can assume that ancient Greeks of the prehistoric periods considered a dry

![Map of ancient Greece indicating the location of major ancient Greek centers. Most of them (e.g., Athens, Knossos, Mycenae, Ephesus, Miletus, Delos, Cos, and Thira) are located in the driest areas of the Aegean region.](https://iwaponline.com/wp/article-pdf/21/2/245/553594/021020245.pdf)

Fig. 1. Map of ancient Greece indicating the location of major ancient Greek centers. Most of them (e.g., Athens, Knossos, Mycenae, Ephesus, Miletus, Delos, Cos, and Thira) are located in the driest areas of the Aegean region.
climate as more convenient or healthier; ostensibly, this choice of location offered good protection from floods and water-related diseases (Koutsoyiannis et al., 2008; Koutsoyiannis, 2012). One recent survey by Crouch (2003) suggests, however, that an alternative to locations close to major watercourses was to choose regions with rich karst formations. Although Crouch’s focus was on the development of Classical Greek urban centers, much speaks for the idea that this logic applied to Bronze Age societies as well. The implication of this is that from an early date, storage of water became the solution to societal developments in the driest southeastern region of Greece and the Aegean Islands.

The major Hellenic civilizations developed in elevated places or on small plains situated between mountain ranges where water was scarce (Yannopoulos et al., 2015). This was the case in mainland Greece and on the islands of the Aegean and Adriatic regions (Zarkadoulas et al., 2012). Thus, innovative use of water appears to have been the solution to several water resources management problems rather than to pure technological development (Angelakis et al., 2012). For instance, the demand for water in the earliest urban societies located on hilly terrains posed a constant challenge, which they addressed by extracting water from springs (Dijksterhuis, 1987). Moreover, when the need for water increased due to agriculture and household demands, the earliest Greek societies gained access to groundwater resources through the construction of wells (Voudouris, 2012). This may be proof of the idea that cultural and societal achievements in ancient Greece were mainly due to the limited water resources, perhaps reverberated in Plato’s dictum (428–348 BC): the need induces creativity.

Recently, Angelakis (2017) demonstrated that the Minoans developed an advanced infrastructure for integrated water resources management with provision for matching demand and supply and possible increased future needs. Apparently, one significant characteristic of the Minoan civilization was its peaceful living with the environment and neighboring societies. The Minoans dominated the Eastern Mediterranean for almost two millennia, and apparently, according to later tradition echoed in the work of the 5th century BC historian Thucydides, they took an active part in restricting some of the conflicts that occurred in the region by forming a Thalassokratia – or ‘sea power’ (Angelakis, 2017). For that reason, A. Evans (1921–1935) associated the Minoan era with Pax Minoica (or Minoan peace). Although there are strong indications that the Minoans lived in harmony with the environment and that they accomplished significant advancements in technology, art, and culture, new advances in studies of cultural exchange in the ‘Minoan World’ demonstrate different developments in the Southern and Eastern Aegean, respectively (Gorogianni et al., 2016). In addition, remnants of various relevant structures suggest that the Minoans had a very good level of knowledge of basic concepts and principles of water management. This furthermore ensured that the Minoans implemented sustainable strategies for water resources engineering and management practices (Angelakis, 2017).

Classical and Hellenistic Greece

The Minoan technological achievements passed on to the Mycenaeans, but we cannot establish a direct lineage of Archaic and Classical Greek societies inheriting Bronze Age achievements. However, it is a possibility that during the Dark Ages (c.1100–750 BC), the technological achievements of the Bronze Age were not totally forgotten. ‘Bridges’ from the past to the future are sometimes present, albeit oftentimes they are invisible to those who cross them. The several types of cisterns developed in Minoan and Mycenaean times provide a characteristic example of survival, as they are still widely used on many anhydrous islands (Angelakis et al., 2013). In addition, Angelakis (2017) has recently
argued that one of the great achievements of the second millennium Hellenic cultures was to instigate technological developments that were unprecedented in world history, displaying numerous paradigms on water resources technologies, their uses as well as household, water and waste- and storm-water management.

In the Classical to the Hellenistic periods, ancient Greek societies managed to establish balances between structural and nonstructural (institutional) measures to improve water management. These involved both large-scale (e.g., the Peisistratean aqueduct of 6th century Athens) and small-scale (wells and cisterns) projects. In addition, throughout this period, public interest in large-scale waterworks grew in parallel with a private interest in the development of small-scale waterworks to underpin local needs for water management (Koutsoyiannis et al., 2008). In Athens, for example, the two main streams, Ilisos and Kephisos, and the small springs in the area could not meet the demands of the city. Consequently, the Athenian demos saw to the establishment of a water supply based on both public and private wells (Figure 2). Archaeologists have identified more than 400 wells with a great variation in depth, ranging from 2.5 to 37 m, dating from the early Classical to the Roman period (Angelakis et al., 2016). Scholars have long recognized the well-known aqueduct attributed to Peisistratos’ tyranny (546–527 BC) as the most important public hydraulic construction work of that time. In addition, from around the same period the famous Eupalinean aqueduct known as ὀρυγμα (tunnel) was constructed on the Aegean island of Samos (Voudouris et al., 2016).

After the introduction of egalitarian rule or democracy in Athens in 508/7 BC, wells gradually complemented or replaced cisterns. The construction of cisterns was a known practice in earlier periods; for instance, several cisterns originating from the 6th century BC have been found inside the Acropolis wall

Fig. 2. Wells from the Classical period: (a) distribution of ancient wells around the Athenian Agora (data from the American School of Classical Studies at Athens) (Chiotis & Chioti, 2012) and (b) sketch of a typical well (Camp, 2002).
to the left of the Propylaea (Koutsoyiannis et al., 2008). Moreover, the principle of constructing water cisterns became a widespread practice in many Greek communities in the Hellenistic period.

Apart from developing applied technologies for the construction of an adequate water supply as well as drainage and sewerage systems in urban centers, several city-states developed legislative frameworks for water management. Ostensibly, Solon, the Athenian political leader and poet, who was elected Archon in 594 BC and shaped a legal system by which he reformed the economy and politics of Athens (Koutsoyiannis & Patrikiou, 2013; Angelakis et al., 2016), introduced the earliest extant regulations. According to the late source Plutarch (45–120 AD), Solon established, among others, a legal system to regulate and encourage the use of wells:

‘Since the country was not supplied with water by ever-flowing rivers, or lakes, or copious springs, but most of the inhabitants used wells which had been dug, he made a law where there was a public well within a hippikon, a distance of four furlongs, that should be used, but where the distance was greater than this, people must try to get water of their own; if, however, after digging to a depth of ten fathoms on their own land, they could not get water, then they might take it from a neighbour’s well, filling a five-gallon jar twice a day; for he thought it his duty to aid the needy, not to provision the idle’ (Plutarch, Solon, 23.5, translation by Bernadotte Perrin, Cambridge, MA, 1914).

Scholars disagree on whether or not Solon’s reforms and individual laws had any relevance for the conditions in the Classical period (e.g., Foxhall, 1997). The fact remains that no evidence supports the idea that Solon’s regulations were in fact used to eliminate or reduce problems of water deficiency in the Classical period – let alone in his own days. More acute is the question of how 5th century Athens and Attica were able to sustain the growing population in the aftermath of Persian wars (499–479 BC), including the question of water resources (Raaflaub, 1998).

During the so-called Golden Age, Athenian culture flourished under the leadership of Pericles (495–429 BC). During this period, the Athenians built mainly small-scale constructions to facilitate household requirements, as well as developing an institutional framework for the sustainable management of water (Koutsoyiannis et al., 2008). Furthermore, there was at least one public official responsible for waterworks even in the early 5th century BC, named κρουών Επιμελητής, (i.e., superintendent of fountains). The aim of his appointment was to secure the operation and maintenance of the city’s water supply system, to monitor the enforcement of the regulations, and to ensure the fair distribution of water. He was (according to Aristotle, The Athenian Constitution, 43.1) one of the few city magistrates who was not appointed by lot, but was elected by vote, such was the importance of this functionary’s honesty and know-how (Tassios, 2002). Demosthenes and Themistocles, among others, had served in this post. Moreover, it may indicate that suitable candidates for this magistracy would need special skills in order to be successful candidates for this important job of overseeing the water supply. An Athenian decree concerning the Athenian water supply involving Pericles’ family is shown in Figure 3 (Krasilnikoff, 2016). The so-called ‘Springhouse Decree’, probably issued no later than 430 BC, included regulations regarding the Athenian water supply. Woodhead (1973–1974) observed that:

‘The meagre remains of lines 5 and 7 make it evident that there is a problem of water-supply or drainage: line 8 stresses a need for economy in the financing of what is to be done; lines 9 and 10 reflect some intention to press ahead quickly with the business in hand. Lines 14-16, in the second amendment, relate the matter to Perikles’ sons Paralos and Xanthippos, to the phoros (tribute) derived from the Athenian allies, and to some thing or things apparently customary or statutory in relation to this.’
Moreover, according to Mattingly (1996), the decree ‘… demonstrates that Pericles’ family and his wards had offered to defray its costs, but the Assembly decided that it would be paid for out of current tribute’. He takes this decree as an example of the strife where ‘the oligarchs’ prevented the Periclean family from exploiting this situation to promote and extend their patronage bonds (IG I3 49. Mattingly, 1996, 508–509; see also pp. 24–25 and pp. 193–194 for new reading of the Greek text).

Moreover, several city-states in the Classical period successfully implemented public projects. In that case, the demos announced the project specifications on stelae in public sites so that everyone would have access to all project details, and this procedure also made it difficult for both parties involved to breach the project contract:

(a) An interesting paradigm is the contract for the construction of a flood drain at the sanctuary of Amphiarion, dedicated in the late 5th century BC to the healer-hero Amphiaras. It is situated in the hills of Oropos, located 37 km northeast of Athens, and the contract dates back to 335–322 BC (Appendix 1, available with the online version of this paper).

(b) Another interesting paradigm is the contract for draining and exploitation of Lake Ptechae in Eretria in central Greece (probably identified with Lake Dystos in southern Euboea. A summary of the main contract is presented in Appendix 2, available with the online version of this paper). Walker (2004) recently suggested that an additional advantage of draining the lake was to prevent malaria.

Other regulations protected surface waters from pollution (MacDowell, 1978). An Athenian inscription from c.440 BC contains a law for tanners who were enforced not to dispose of their waste in the Ilissos River (Supplementum epigraphicum Graecum III, 18; Pappas, 1999).

As the urban public systems grew and aqueducts transferred water to public fountains, private installations like wells and cisterns tended to be abandoned. As the latter would be necessary in times of war
because the public water system would be exposed, the owners were forced by regulation to maintain the wells in good condition and ready to use (Korres, 2000).

The entire water regulation and management system in Athens must have worked exceptionally well and been close to what we today call sustainable water management. For example, modern water resource policymakers and, at recent international conferences, hydraulic engineers, have emphasized the nonstructural measures in urban water management and the importance of small-scale structural measures like domestic cisterns. Such cisterns have two advantages: they reduce storm water quantities and potential flood risks and increase the water availability by providing a source of water for use (such as watering of gardens) (Angelakis, 2016).

As mentioned above, in the course of the Classical period, larger city-states felt it necessary to introduce superintendents and/or magistrates to oversee specifically the various parts of the city’s water supply, wells, and wastewater (Angelakis et al., 2005). This is most clearly mirrored in Plato’s Laws, where the astynomi (city wardens) are instructed to secure a stable and clean water supply for Plato’s ‘ideal’ city (Plato Laws, 759 a7–8, 763 d1–6; Klingenber, 1976).

A number of laws designed to preserve the scarce resources of the city and individual farmers originate from 5th century Gortyn, Crete. First, a regulation instructs individuals – probably farmers engaged in irrigation – not to extract water from the River Litheos to prevent the water level from going below the mark set on the bridge. Surely, the River Litheos was vital for Gortyn’s water supply, and the regulation undoubtedly reflected that the river supplied both farming and household activities in the city (extract from the 5th century bc inscription from Gortyn on the island of Crete) (Figure 4) (Krasilnikoff, 2002). The city extended on both sides of the river Litheos.

‘Θιοί· τὸ ποταμὸ αἰ κα κατά τὸ μέττον τὰν ροὰν θιθή ρὴν κατά τὸ Γὸν αὐτὸ, θιθεμένοι ἀπατον ἡμην. Τὰν δὲ ροὰν λέιπεν οἴττον κατέκει ἓ ἐπ’ ἀγορά τῆς πίερα ἀ πλιον, μείον δὲ μὴ.’

Fig. 4. Regulation to preserve a minimum water level in the River Litheos.
Translation

‘Gods; if anyone makes the flow of the river run from the middle of the river towards his own (property), it is without penalty for the person so doing. (He is) to leave the flow as wide as the bridge at the agora holds, or more, but not less’ (translation, Davies, 1996, 51).

Two additional inscriptions from Gortyn reflect the other concern of ancient Greek lawmakers, which was to prevent damage caused by farmers channeling drainage water into neighboring fields causing damage to construction works and crops (ICret IV 73 A, ICret IV 52 A and 52 B, 1–6; Krasilnikoff, 2010). The latter problem is also the issue in a forensic speech by the Athenian politician and logograph Demosthenes (55, against Menecles), presumably from the middle of about the 4th century BC (Krasilnikoff, 2014).

Roman times

Generally, after establishing Roman provinces in mainland Greece in the 2nd century BC, and no longer being prohibited by strict city-state boundaries, local and Roman authorities improved the water supply of several cities by constructing long-distance aqueducts (Alcock, 1993).

The redefinition of boundaries also created the opportunity for local dignitaries such as the second century Athenian elitist Herodes Atticus. Herodes excelled in projects of euergetism, including several which involved construction of a water supply in Athens and the outlet of an aqueduct, the Nymphaeum or Exedra, provided drinking water for attendants at the Olympic games (Tobin, 1997).

A marble block with a ‘water law’ from the early 2nd century AD has been unearthed in the ancient city of Laodicea in the western province of Denizli, Turkey (Hurriyet Daily News, 2015). Laodicea was an ancient city built on the River Lycus (Çürüksu) located in the Greek-speaking regions of Caria and Lydia, which later became the Roman province of Phrygia Pacatiana.

The block, which is 90 cm in length and 116 cm in width, displays how the use of water in the city was managed by virtue of law and how culprits were punished by penalties ranging from 5,000 to 12,500 denarii. The ‘water law’ marble block dating back to 114 AD includes strict measures regarding the use of water coming from the Karcı Mountain through channels to the city, as well as the use of a fountain dedicated to the Roman Emperor Trajan (Figure 5). Allegedly, the rules were instated by the Anatolian State Governor Aulus Vicirius Matrialis (Daily News, 2016). Some of the rules included the following (Miller, 2015):

‘Those who divide the water for his personal use, should pay 5,000 denarius to the empire treasury; it is forbidden to use the city water for free or grant it to private individuals; those who buy the water cannot violate the Vespasian Edict; those who damage water pipes should pay 5,000 denarii; protective roofs should be established for the water depots and water pipes in the city; the governor’s office will appoint two citizens as curators every year to ensure the safety of the water resource; nobody who has farms close to the water channels can use this water for agriculture.’

Conclusion

There is evidence that the Greeks have been developing advanced infrastructures for the management of their scarce water resources since the prehistoric times (Angelakis, 2017). By comparing the water
infrastructures used later on in Classical urban areas (e.g., in Athens) to those elaborated on in Minoan Crete (e.g., Knossos) a couple of millennia BC, the conclusion reached by Wilson (2000) is justified – the individual elements of the water supply and drainage systems appear relatively early and remained largely unmodified until the Middle Ages. However, the development of the water management strategies in the 2nd millennium Bronze Age Greek societies was not accompanied and clarified by written evidence for their judicial implementation. It was not until the emergence of the city-state in the Archaic period that evidence of a ‘water law’ and associated institutions emerged in a form which allows for further studies. Moreover, the pattern to emerge in the Classical period focused on solving the growing problems of providing water to the large populations of the cities as well as disposal of waste- and storm-water, and finally on preventing damage caused by water in densely farmed regions. Thus, larger city-states instructed magistrates and/or superintendents (astynomoi and agoranomoi) to oversee the water laws of the city. In the Roman period, the institutions of the Classical period survived, but were accompanied by initiatives from the central authorities, which ensured that large-scale waterworks, i.e., long-distance aqueducts, were constructed.

Finally, as the review above indicates, the need for legal regulation of water management is not a modern creation and there is a long tradition of solving complex issues of water management with rather sophisticated legal measures. It should be noted that about 10% of the world’s population have no access to improved drinking water and some 2.4 billion people do not use improved sanitation facilities; of these, 1 billion people still practice open defecation (UN Water, 2016). However, there is a vast need for sustainable and cost-effective water supply and sanitation facilities, particularly in developing cities. Thus, re-evaluation of selected ancient Greek and Roman institutional regulations of water management may prove useful and work as inspiration for some contemporary developing societies. And remember that: ‘The farther back you can look, the farther forward you are likely to see’ (Winston Churchill, 1874–1965).
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References


Tassios, T. P. (2002). *From Peisistratean to Evínos (Απ’ ο Πεισιστράτευο στον Εύηνο).* Kathimerini, March 24, Athens, Greece. (in Greek).


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