Resilience and Sustainability in Ancient Mesopotamian States and Empires

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Resilience and Sustainability: What Are We Learning from the Maya and Other Ancient Cultures?

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Dr. Jason Ur
John L. Loeb Associate Professor of the Social Sciences
Department of Anthropology
Harvard University
Cambridge, Massachusetts, USA
jasonur@fas.harvard.edu
http://www.fas.harvard.edu/~anthro/ur
Issues of resilience and sustainability are relevant to all modern societies, but especially in the Middle East. Its lands have hosted many ancient civilizations, all of which have risen, and nearly all of which have fallen. Among them are the earliest states, the earliest urban settlement systems, and the earliest literate societies. Some proved to be sustainable for centuries and sometimes more than a millennium, but ultimately none were entirely resilient. The causes of growth and collapse are hotly debated, almost all of them. Of course there are academic questions to be asked of these civilizations, but potentially some lessons for modern times.

Modern states in the Middle East appear to be teetering on the fringes of viability. Across the region, cities are growing at an alarming rate, for economic, cultural, and political reasons. Their consumption patterns place great strains on them, especially consumption of water. Many modern states are overly dependent on single industries, such as oil or (in the case of Egypt) tourism. It is not difficult to envision precipitous collapses for such societies. Indeed there are many who think that the current upheaval in Syria was precipitated by a nearly decade-long drought, which had pushed people to their limits.

On the other hand, the archaeological record in the Middle East shows evidence for great past resilience. Take, for example, the iconic form of archaeological site in the ancient Near East: the tell. Tells were formed by the construction of densely packed mud brick houses. Such structures have a viable life of only about 50 years, at which point they must be leveled and rebuilt. Building, leveling, and rebuilding occurred continuously over tens of generations at some ancient places, resulting in towering masses of artificial piles of earth. For example, Tell Brak in northeastern Syria stands 40 meters over the plain. It is entirely an artificial construction that grew gradually over the course of at least five thousand years. The question for archaeologists becomes what drew people to these places, and what kept them there, not just in the general region but precisely on the same patch of landscape, in some cases for many millennia.

In nearly all time periods until the recent present, the baseline human settlement has been the small agricultural village. Its inhabitants’ lives revolved around cereal agriculture (mostly wheat and barley) and animal husbandry of sheep and goat, and to lesser extents pigs and cattle. Fields closest to the village were cultivated intensely, and fields a bit farther were cropped less intensively, and maybe left fallow more frequently. Beyond these fields were pasture for the villagers’ flocks and herds. We can see the spatial arrangement of this infield-outfield system at the Turkish town of Siverek in the 1960s. But it has an ancient pedigree; here is the same system around the Early Bronze Age (ca. 2600-2000 BC) town of Tell Jamilo. In the archaeological example, only the trackways survive, but the spatial patterning is unmistakable.

This pattern has prevailed for millennia, but under certain cultural and political conditions it was transformed into more complex patterns: cities and settlement hierarchies. These historical phases have received the overwhelming majority of archaeologists’ attention. I’ll now consider two such phases as case studies in briefly successful but ultimately non-resilient Mesopotamian societies. In the first, the Early Bronze Age (ca. 2600-2000 BC), cities emerged along the northern Fertile Crescent and began to push up against the limits of economic and demographic growth; in the second, the Iron Age empire of Assyria (ca. 900-600 BC), these limits were consciously exceeded via demographic and hydraulic engineering. Neither of them are with us anymore. What can we learn?

First, the Early Bronze Age. In the middle of the third millennium BC, towns and cities emerged along the northern Fertile Crescent, in what is today Turkey, Syria, and Iraq. Their residents were largely farmers and herders, but with sophisticated new economies of crafts and trade. Inequalities had developed that allowed for disparities in wealth, and for tremendous labor mobilization for palace and temple construction.

Roughly a dozen of these towns grew to even greater proportions. When excavated, these places were densely packed with residential housing along narrow streets and alleys. In total area, they covered up to about 100 hectares, or a square football field. One archaeologist has proposed that this was a limitation
beyond which it was not possible for cities to grow, given transportation technologies and the lack of a price-fixing market for agricultural products.

To sustain these nucleated populations, urban farmers took two steps. In traditional societies, farmers will leave fields fallow every second or third year, to allow them to recover soil nutrients and moisture. We suspect this from the radial patterns of trackways around Early Bronze Age cities. These tracks formed as traffic (human and animal) was constrained onto the paths between cropped fields. Such movement was typical of all periods, but only in the Early Bronze Age was constraint so intense that the trackways were deeply etched into the landscape, to survive up to today. This intensified constraint came from the fact that all fields were cultivated at all times- in other words, farmers were disregarding the fallow year in pursuit of short-term gains.

The second step was manuring. The fields around EBA sites are covered in a continuous carpet of small potsherds. This carpet is dense around EBA sites and fades with distance from them. The best interpretation of this phenomenon is that farmers were taking settlement debris- mostly organic refuse from their houses, but including inorganic materials like broken pots- and spreading it on their fields as a nutrient additive. This practice was probably an attempt to ameliorate the effects of fallow reduction.

These cities all collapsed spectacularly between 2200-2000 BC. One theory sees the collapse as the result of abrupt climate change. This is unlikely, since the timing and scale of collapse varies from city to city. It seems more likely that the cities had simply lost their resilience. Even if there was not abrupt event, rainfall in this region is highly seasonal- high one season, low the next. The region is frequently faced with multi-year droughts. A likely scenario is that once cities approached the 100 hectare threshold, they were increasingly unlikely to persevere in the face of a multi-year or decade long drought, the sort that occur once or twice every century. In this case, the proximate cause was climatic, but the ultimate cause was social: the overextension of urban nucleation.

In the Early Bronze Age, fragile urban places emerged in an organic manner, and individual households appear to have developed methods for sustaining themselves, and incidentally the city as a whole. In the Iron Age, over a millennium and a half later, the region witnessed another high urban phase, but from very different factors. In the early first millennium BC, the kings of Assyria had conquered most of the Middle East. From a historic homeland along the Tigris River, in what today is northern Iraq, the Assyrian grew to encompass all of Iraq, and parts of Iran, Turkey, Syria and the Levant.

The core of the empire went through an urban boom. We know quite a bit about the imperial capitals because they have been excavated since the 1840s. The great palaces of kings such as Ashurnasirpal, Sargon, Sennacherib, and Ashurbanipal were cleared. Some of their treasures now reside in the British Museum and the Louvre. These palaces were the centerpieces of huge new foundations. Nimrud, the capital built by Ashurnasirpal, had a wall that enclosed 360 hectares and may have held 60,000 people. The final capital of the empire was Nineveh. Today it is entirely within the fabric of the Iraqi city of Mosul. Its founder was Sennacherib, who built a residence that he called his “palace without rival.” The city walls of Nineveh were 20 meters tall and enclosed 750 hectares. With a possible population of around 150,000 people in 700 BC, it was the largest city in the world.

These new cities came with new hinterlands. Under the command of the kings, Assyrian engineers completely reworked the natural hydrology of Assyria. Rivers and canals were redirected into enormous canals, to flow to the great capital cities. A canal commissioned by Sennacherib began beneath a huge relief of the king before the gods of Assyria. It flowed ninety-five kilometers to arrive at the wall of Nineveh. Along the way, it crossed an aqueduct of half a million cut stone blocks, with inscriptions naming king Sennacherib. Dozens of canals and segments have been found on the ground and via satellite imagery, showing the dramatic state-directed transformation of the natural terrain.

But not all of that water went to Nineveh; it’s clear that there were off-takes throughout the systems. But who benefited from these waters? The answer is probably the same as who came to live in these massive
new capital cities. It seems increasingly likely that the cities and countryside were filled with forced migrants, deliberately deported from their conquered homelands. The Assyrian kings make great claims about forced deportation, and these stories also show up in the bible. However, royal inscriptions are highly propagandistic, and should never be taken at face value; and the bible has its own challenges as a historical source.

Archaeology, however, does not lie, it is only misinterpreted. The emerging settlement pattern appears to be showing the signs of a sudden influx of people. For example, let’s consider the plains northwest of Nineveh, what today is the border between Syria and Iraq. Two intensive field surveys have revealed patterns of settlement during the last 8,000 years. In the Early Bronze Age, the time I described earlier, the settlement pattern is highly urban—there are only a few sites, and they tend to be either towns or large cities. Nearly everyone was an urbanite. Now let’s flash forward to the Neo-Assyrian period, when this area was the hinterland of the imperial capital. The great cities are gone: both major centers had shrunk to small villages. Furthermore, the landscape had filled in—not just the well watered areas but the whole plain, and very evenly. This, I suggest, is the landscape signature of those deportees, having been deliberately planted in open land via a policy of agricultural colonization.

The Assyrian landscape was thus highly artificial—new urban foundations, new surface waters, and new rural and urban populations—and the deliberate result of imperial policy. There may have been many motivations, but largest was probably a desire for urban growth—build the cities, bring in the agricultural labor to sustain them, put the labor onto the landscape, and then enable their productivity with irrigation. This policy seems to have been successful for a time. Parts of this settlement system seem to have operated for over two centuries. The system did not, however, survive the political entity that created it. After the collapse of the empire around 600 BC, the rural settlements blinked out, and the irrigation systems ceased to flow. Even the mighty capital cities vanished. A few centuries later, even the memory of Nineveh’s location had been lost, and would remain so for over two millennia.

These two cases have some similarities. Both urban civilizations that expanded beyond the natural limitations of their environments via social and technological innovations. Both collapsed spectacularly, in the form of rapid de-urbanization and probably also demographic collapse. On the other hand, there are some important differences. The Assyrian case might seem like it was doomed from the start—over-extended cities, maintenance-intensive water systems, and a non-local labor force of dubious loyalty. On the other hand, the Early Bronze Age urban systems where, I have argued, an emergent result of household-level decisions and motivations. In other words, very organic.

Yet both failed, ultimately. It is important to say “ultimately,” because both lasted for several centuries, or tens of generations. So for a long time, these societies and their leaders must have felt confident and secure that their largely urban way of life was durable and natural.

But in both cases, these economic systems were not flexible. Highly urbanized and specialized political economies made great demands on the subsistence economy. The EBA cities intensified cultivation, and introduced manuring techniques. But even these innovations probably couldn’t handle extreme climatic events like droughts, the sorts that occur once every century or two. The Assyrians probably thought that they had overcome fluctuations in rainfall, to create such tremendous cities. But their system was socially fragile—it required a vast but compliant labor force, and an administrative system to deploy it.

Are these case studies just historically interesting, or can we learn from them? Causation in archaeology is always challenging, especially prehistoric and early historic archaeology. There are many variables in the operation of early complex societies, and we don’t fully understand many of them in the EBA and Assyrian cases. But at the most general level, these societies were forced into dramatic change because they lacked flexibility in some aspect—an inability to handle shifts in climate, economy, or politics, to name a few.
So “be more flexible” is hardly something that we can convert into progressive environmental or economic policy. But it is something that can get us to start thinking. These Near Eastern case studies revolve largely around the subsistence economy, and they’ve gotten me thinking about where my own food comes from. Our food systems are hyper specialized, especially in New England, where I live. Those famous forests that change color spectacularly every fall? Two hundred years ago they were all fields and pasture, but agriculture has long since fled elsewhere. But it’s coming back—Community Supported Agriculture is a growing trend, and my family now gets almost all of its vegetables from a farm in central Massachusetts. We do our best to buy locally produced products when feasible, and we encourage our friends and family to do the same. Although I am a big fan of local actions leading to global changes, or emergence, I know that these household level actions aren’t going to singlehandedly introduce greater resilience into the American agricultural economy. But until our political leadership recognizes the threats that come from climate change, population growth, resource depletion, to name a few, I’m not sure what else can be done.

Short Biography

Jason Ur is the John L. Loeb Associate Professor of the Social Sciences in the Department of Anthropology at Harvard University. He specializes in early urbanism, landscape archaeology, and remote sensing in the Near East. His research focuses on the impacts of early urban communities on their landscapes using field survey and satellite remote-sensing techniques, in particular declassified intelligence satellite photographs. In Syria, he has participated in or directed surveys around the major Bronze Age cities of Hamoukar, Tell Brak, and Tell Beydar, with emphasis on their spatial dimensions, agricultural systems, and communications networks. His remote sensing studies have demonstrated the extent of imperial irrigation systems in northern Iraq and northwestern Iran, and revealed pastoral nomadic landscapes in Iran and southeastern Turkey. He holds a BA from the University of Pennsylvania (Anthropology) and a PhD from the University of Chicago (Near Eastern Languages and Civilizations). He is currently leading an archaeological survey in the Kurdistan Region of northern Iraq, and preparing a history of Mesopotamian urbanism.