



---

## Silent Hazards, Invisible Risks: Prehispanic Erosion in the Teotihuacan Valley, Central Mexico

---

*Emily McClung de Tapia*

The prehispanic urban center of Teotihuacan (ca. AD 1–650) dominated the landscape of a watershed situated in the northeast sector of the Basin of Mexico (figure 6.1), a closed hydrological basin characterized in prehispanic times by a lake system that has since been largely drained and otherwise modified in historical and modern times. It is the site of the first major city in the Americas, the capital of a complex state society that grew to dominate the basin and adjacent valleys of central Mexico, with contacts in southern Mesoamerica (Millon 1988). While the region undoubtedly offered an attractive habitat for early Holocene hunter-gatherer-fishers between volcanic events (González et al. 2006), the earliest agricultural settlements date much later, to approximately 1150 BC (Sanders, Parsons, and Santley 1979). The results of detailed settlement studies in the region provide a framework for understanding the evolution of human communities, their spatial distribution, and potential resource use (ibid.).

Paleoenvironmental studies in the Basin of Mexico have focused mainly on the Late Glacial Maximum and the Pleistocene-Holocene transition. Unfortunately, the period of human occupation is poorly represented as a result of inconsistent sedimentation, volcanic ash deposits, surface deflation, and the effects of tectonics; the last three to five millennia are usually grouped together as a single period marked by human impact, understood as agricul-



**6.1.** *Prehispanic urban zone of Teotihuacan, Mexico. Photo by Horacio Tapia-McClung.*

tural activities and related deforestation.

### THE TEOTIHUACAN REGION

The study area is characterized today as semiarid, with a marked seasonal rainfall regime alternating between a rainy season from April-May to September-October and a dry season that dominates the remainder of the year. Average annual precipitation is approximately 500 mm, with some variation at different elevations, and average annual temperature is 15°C. Five main vegetation types are predominant: grassland, xerophytic scrub, oak scrub, oak forest, and aquatic vegetation. Elevation ranges and key plant taxa associated with these communities are summarized in table 6.1 (Castilla-Hernández and Tejero-Diez 1987; Rzedowski et al. 1964). Archaeological plant remains indicate that these communities, together with pine and mixed pine-oak forest, were present during prehispanic times (Adriano-Morán 2000; Adriano-Morán and McClung de Tapia 2008).

Although the Basin of Mexico bore witness to a long sequence of devastating volcanic eruptions, the Teotihuacan region itself (figure 6.2) seems to have been largely spared—at least since the mid-Holocene—perhaps because of its location north of a low range of hills that forms an eastern extension of the higher mountain chain known as the Sierra Nevada. The exception to this situation is evident in the southwestern portion of the alluvial plain, which drains into the former Lake Texcoco. Here, lacustrine sediments are mixed with vol-

**Table 6.1.** Present-day vegetation types in the Teotihuacan Valley, Mexico. Pine (*Pinus* spp.) or mixed pine-oak forest was present during the prehispanic period.

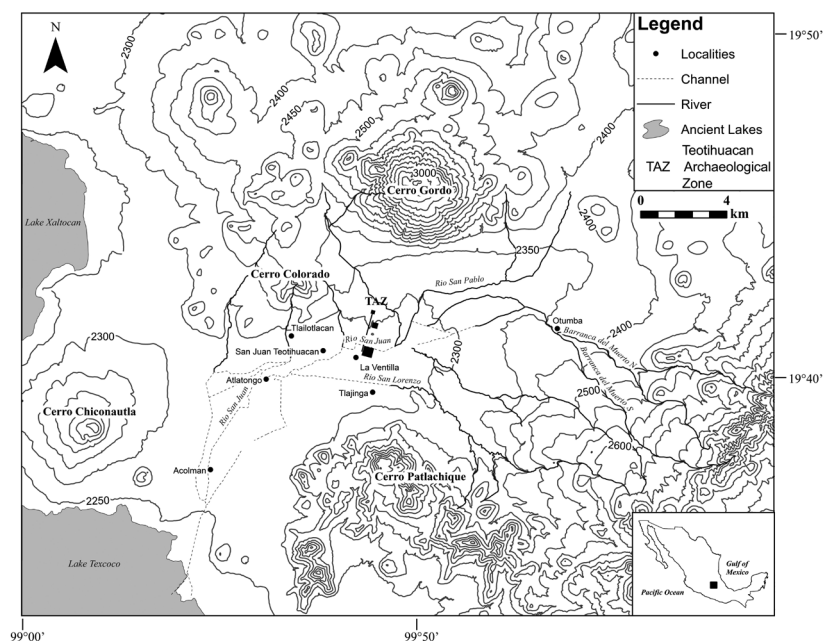
<i>Vegetation Type/Elevation Range</i>	<i>Key Species</i>
Oak forest (3,000–3,050 masl)	<i>Quercus crassipes</i> , <i>Q. greggii</i> , <i>Q. mexicana</i>
Oak scrub (2,800–3,000 masl)	<i>Quercus frutex</i> , <i>Baccharis conferta</i> , <i>Eupatorium glabratum</i>
Xerophytic scrub (2,300–2,750 masl)	<i>Opuntia streptacantha</i> , <i>Zaluzania augusta</i> , <i>Mimosa aculeaticarpa</i> var. <i>biuncifera</i>
Grassland (2,400–3,050 masl)	<i>Buchloe dactyloides</i> , <i>Hilaria cenchroides</i> , <i>Bouteloua gracilis</i>
Aquatic vegetation (2,240–2,260 masl)	<i>Cyperus</i> spp., <i>Eleocharis</i> sp., <i>Hydrocotyl ranunculoides</i> , <i>Polygonum</i> spp., <i>Scoenoplectus tabernaemontani</i> , <i>S. pungens</i> , <i>Typha latifolia</i> , <i>Nymphaea</i> sp., <i>Potamogeton</i> sp.
Riparian Gallery (2,240–2,300 masl)	<i>Salix bonplandiana</i> , <i>Alnus glabrata</i> , <i>Populus arizonica</i> , <i>Taxodium micronatum</i> , <i>Fraxinus uhdei</i>

Note: masl = meters above sea level.

Sources: Vegetation types: Castilla-Hernández and Tejero-Diez 1987; Rzedowski et al. 1964. Forest data: Adriano-Morán and McClung de Tapia 2008.

canic ash from several tephtras (Lamb et al. 2009). However, several millennia of natural events and human activities have modified the entire region, thus complicating the reconstruction of past landscapes and understanding of the challenges faced by human populations.

The enormous growth of Teotihuacan around approximately AD 200 has recently been attributed to the mass influx of migrants from the central and, especially, the southern sectors of the Basin of Mexico as a consequence of a catastrophic eruption of Popocatepetl, dated to around 100 BC–AD 70 (Plunket and Uruñuela 2006, 2008; cf. Siebe et al. 1996). Earlier investigators had noted the immense growth of the city around this time (Millon 1970, 1973), coincident with significant decline elsewhere in the basin (Sanders, Parsons, and Santley 1979). In the early years of the Basin of Mexico surveys, however, little was known about the sequence of volcanism and its impact on human communities in central Mexico, and almost no systematic geoarchaeological investigation was undertaken in the region until the late twentieth century (Cordova 1997; Córdoba and Parsons 1997; Frederick 1997; Frederick, Winsborough, and Popper 2005; Hodge, Cordova, and Frederick 1996). Consequently, the apparent depopulation of a large part of the Basin of Mexico at the time of Teotihuacan expansion was hypothesized to be a result of the immense attraction offered by the growing city to the north—as a pilgrimage center and multiethnic enclave, a commercial hub, and similar attributes (Millon 1973). Obsidian mining and production was firmly controlled by the state, initially dependent on a source of black obsidian available within the valley close to



**6.2.** *Location of the Teotihuacan region in the Basin of Mexico, central Mexico. Map by Rodrigo Tapia-McClung.*

Otumba and eventually expanding to dominate the source of green obsidian at Cerro de las Navajas north of Pachuca (ibid.; Sanders, Parsons, and Santley 1979). Diverse products were obtained from distant regions—ceramics, jade, and other types of greenstone; mineral and organic substances for the elaboration of paints; animal species (live as well as skins), to name a few.

The Teotihuacan state collapsed around AD 600–650. While the direct causes are still open to discussion, growing evidence supports the idea that internal social conflicts were a potential factor and that the elite sector of the society gradually distanced itself from such mundane realities as meeting the subsistence needs of the highly controlled population (Gazzola 2009). Some authors have proposed that degradation of the landscape resulting from deforestation and exhaustion of the soils in the region may have provoked an ecological collapse at the end of the Classic period (Sanders 1965; Sanders, Parsons, and Santley 1979), while others have suggested that climate change affected the region (Manzanilla 1997). Although many references in the literature emphasize the city's destruction and subsequent abandonment, this appears to have been associated mainly with ceremonial areas in the central sector and high-status residential areas; overall population decline seems to have taken place over a period of about two centuries (Charlton and Nichols 1997;

Cowgill 1974; Millon 1988). There is considerable evidence for the influx of new groups with different cultural traditions at the time of Teotihuacan's collapse (Manzanilla 2005; Rattray, Litvak, and Diaz 1981). A process of continual, albeit gradual, resettlement was apparent beginning around AD 900, culminating in a Late Postclassic (ca. AD 1350–1520) regional population estimated at around 150,000 inhabitants. Although this figure parallels the population at the height of the Classic Teotihuacan period, during the Aztec occupation several important administrative centers were dependent on the kingdom of Texcoco, but no single major urban center dominated the political scene (Evans 2001).

The jury is still out on these issues. Research in the Teotihuacan Valley has focused on developing a methodological approach to the study of landscape evolution in this highly modified setting and facilitating a better understanding of the relative dangers of sudden environmental change in the region (Lounejeva-Baturina et al. 2006, 2007; McClung de Tapia 2009; McClung de Tapia et al. 2003, 2004, 2005, 2008; Rivera-Uria et al. 2007; Sedov et al. 2010; Solleiro-Rebolledo et al. 2006).

#### ADAPTIVE CYCLES AND HUMAN ECODYNAMICS AT TEOTIHUACAN

In an attempt to go beyond the description of the more evident components of the complex system of the Teotihuacan state and to focus on its interaction with the landscape within which the city was situated, the history of the region was explored within the framework of a socio-ecological system in which change was viewed in terms of resilience, adaptability, and transformability (Walker et al. 2004). If *resilience* is conceived as the capacity of a system to absorb perturbation and reorganize as a consequence of change, *adaptability* indicates the capacity of actors within the system to influence or manage resilience, and *transformability* refers to the ability to create a fundamentally new system when ecological, economic, or social structures render the present system unviable. The interaction among these variables determines either the direction of change in a socio-ecological system when stress surpasses latitude or the maximum degree of change the system can support before it can no longer recover.

On a superficial level, it appeared that the collapse of the Teotihuacan state and its effects on urban life represented the crossing of a threshold, as did the introduction of Colonial administration at the beginning of the sixteenth century. In fact, this latter event resulted in a major transformation. However, these events were considered from the perspective of the landscape's response rather than that of the political-economic systems, based on the assumption that it was necessary to develop a detailed understanding of what the environment may have been like at different moments in the past before the socio-ecological

structure of prehispanic societies in the region could be analyzed. Although the importance of scale in understanding interactions was clear, no real idea existed of how the landscape operated at different temporal and spatial scales.

### CHALLENGES

One of the major challenges of this research has been to sort through modern and historical impacts on the landscape in an attempt to recognize evidence for processes and events dating to the Classic and Late Postclassic periods. Another challenge is presented by the generally poor preservation of organic remains in both archaeological contexts and soil profiles. Although a considerable amount of paleoethnobotanical investigation has been undertaken in the region, only after decades of research has it been possible to assemble a broad collection of macro- and micro-plant remains representative of the vegetation types that were present in the prehistoric past. In soils studied to date in the region, charcoal has rarely been recovered from stratigraphic contexts, and in many cases ceramics were absent as well (McClung de Tapia et al. 2005). Pollen is generally poorly preserved; however, although it has not been possible to quantify pollen data, it has been feasible to determine the key taxa consistently present in the samples from different time periods. On the other hand, phytoliths (silica particles formed in tissues of certain plants) are fairly well preserved, and types associated with grasses (subfamilies Pooideae, Panicoideae, Chloridoideae, and Aristidoideae) are predominant (McClung de Tapia et al. 2008).

The instability of the landscape over time, together with a long history of perturbations, limited the kinds of soil analyses that could be successfully employed in large parts of the region. Soil properties that are not affected by diagenesis (physical and chemical changes occurring through time) and that are deemed indicators of “soil memory” have been studied in numerous profiles (vertical cross-sections) throughout the area (Rivera-Uria et al. 2007; Solleiro-Rebolledo et al. 2006). In addition, radiocarbon dating as well as the determination of stable carbon isotope ratios ( $\delta^{13}\text{C}$ ) have been carried out for selected soil horizons (specific layers or strata of soil or subsoil in vertical cross-sections) (Lounejeva-Baturina et al. 2006, 2007; McClung de Tapia et al. 2005; Rivera-Uria et al. 2007).

### HAZARDS

Among the key hazards prehispanic populations in the region faced were tectonic movements, volcanic events, and agricultural risks such as early or late frosts, as well as drought, torrential rainfall events, hailstorms, floods, and erosion. Needless to say, these factors are often interrelated.

To date, the effects of earthquakes in the region have not been detected in

the archaeological record. While there is little doubt about their occurrence and presumed frequency based on historical and modern events, the ravages of time and related post-depositional processes have obscured the evidence. Some of the rebuilding of structures at Teotihuacan may have been motivated on occasion by earthquake damage, but no clear evidence has been reported either in the city of Teotihuacan or in rural habitation areas outside the dense urban zone. Periodic rebuilding at the site seems to have been related to aggrandizement of the elite and to have been deeply couched in ritual practices (Sugiyama and López-Luján 2007).

As mentioned, documented volcanic events do not seem to have directly affected the region since the Late to Middle Holocene (Barba 1995; McClung de Tapia et al. 2005), although the bedrock (*tepetate*) is derived from consolidated volcanic ash, and volcanic materials comprise a major component of the soils in the region. What are referred to here as *agricultural risks* are mainly seasonal events related to the intensity of storms and runoff during the summer months, when approximately 80–90 percent of the annual precipitation occurs. However, these kinds of events do not only affect agriculture but may have had much more drastic effects on human groups comprising the different sectors of Teotihuacan society. Because historical records are not available for this time period, many parallels have been drawn with Aztec society for which a number of historical and ethno-historical documents exist. It is important to remember, though, that a period of 700–1,000 years separates these two societies.

### EVIDENCE FOR DEFORESTATION, EROSION, AND FLOODS

The analysis of charcoal specimens recovered from controlled contexts in several archaeological excavations representing the period from the Late Formative (ca. 400–100 BC) through the Late Postclassic (ca. AD 1350–1520) did not reveal clear evidence for deforestation (Adriano-Moran and McClung de Tapia 2008). A particularly notable aspect of this research was the consistent presence of essentially the same arboreal taxa characteristic of the region today, with the exception of pine (*Pinus* spp.), which has disappeared from the local flora. Pollen of these same taxa is consistently recorded in archaeological samples and soils as well; unfortunately, the low representation of pollen overall precludes a more detailed comparison.

In spite of the lack of conclusive evidence for deforestation, it undoubtedly occurred, given the large quantities of wood required as construction material and fuel for ceramic production as well as household consumption (Barba 1995). Deforestation is also indicated indirectly by evidence for erosion (McClung de Tapia et al. 2005). On the other hand, soil studies conducted in the region, together with the distribution of elevation zones and the biotic



requirements of key forest taxa identified from the archaeological plant remains, suggest that the Teotihuacan Valley, at the time of the city's development, was not characterized by broad extensions of dense forest. GIS modeling of these factors revealed that a maximum of approximately 13 percent of the valley surface was likely covered by forest (McClung de Tapia and Tapia-Recillas 1996).

Erosion in the study region constitutes a long-term process composed of numerous episodes, often of differing intensities. The short-term impacts vary from barely noticeable dust storms (surface deflation by eolic erosion), to sediment carried in runoff from torrential storms of relatively limited duration, to severe landslides. The long-term effect is a highly modified, unstable landscape. All of these processes were active in the Teotihuacan Valley as well as elsewhere in the Basin of Mexico during the prehispanic occupation of the region. Deforestation of the surrounding slopes, particularly following the Spanish Conquest, greatly contributed to vegetation change and landscape instability. The cumulative effect of erosion, as evidenced from stratigraphy in the Teotihuacan region, has been the burial of past soils that were productive in prehispanic times as well as significant changes in the hydrology of the valley.

In general terms, the evidence from soils studied in the region indicates mainly polycyclic profiles (associated with two or more partially completed cycles of soil formation), poorly developed for the most part and often truncated, where part of the profile has been lost by erosion. Moderate to well-developed soil horizons are rare, indicating relatively young or degraded soils, and considerable evidence is present for pedosediments (in the process of development) overlying buried soils (McClung de Tapia et al. 2005).

Two examples in the alluvial plain are interesting because ceramics recovered from buried A horizons can be associated with prehispanic occupations and thus dating in relative terms of the overlying erosion sequence. In particular, in the Tlajinga area, ceramics from predominantly Miccaotli and Tlamimilolpa phase (AD 200–400) in a 2A (buried surface) horizon were covered by a C horizon with mainly Xolalpan phase materials (AD 400–550), over which redeposited sherds from earlier Teotihuacan occupations were situated. At Otumba, Mazapan phase ceramics (AD 900–1100) were predominant in the 2A horizon, which in turn was covered by a C horizon without ceramic materials and overlain by Aztec II–III sherds (AD 1300–1500) in approximately 100 cm of additional sediments (Pérez-Pérez 2003). Both areas have detailed histories of prehispanic irrigation detected through excavation (Charlton 1990; Nichols 1987), but the important aspect for this discussion is the evidence for erosion. Both irrigation systems are buried under later redeposited sediments. Particularly at Otumba, the sediments contain high proportions of sand (60–80%).

The presence of Aztec II–III ceramics in the uppermost layers of the Tlajinga sequence indicates that eroded sediments covered the earlier irriga-



tion system prior to the Late Postclassic period. The presence at Otumba of Aztec II–III ceramics in the redeposited sediments overlying Mazapan phase ceramics indicates a still later erosion event, represented by post-Aztec sediments on the surface.

Both Tlajinga and Otumba were situated in close proximity to rivers that have suffered severe incision, probably related to intensive deforestation of upper slopes, apparently dating from the Colonial period (figure 6.3). The presence of sand lenses attests to the deposition of sand on the cultivated surface as the water from these rivers was diverted to provide humidity for irrigation. Once incision lowered the available flow of water with respect to the field surface, irrigation was no longer feasible. The evidence for Aztec agricultural activities at both sites indicates that this process took place at a later time.

The evidence for major hydraulic works in and around the city of Teotihuacan implies that seasonal flooding was a significant problem, for the urban center as well as surrounding agricultural areas. The city's ceremonial center, the so-called Street of the Dead, stretches over 2 km N-S, with a difference in elevation of approximately 30 m from one extreme to the other—suggesting that runoff from the *barrancas* (gorges) and streams that discharged into the Rio San Juan had been channeled to divert excess water from the ceremonial center. It is hard to believe that channeling of the river was undertaken simply to conform to the urban grid, although it undoubtedly served to divert excess rainwater and waste from structures along the Street of the Dead. George L. Cowgill (2000, 2007) suggests that the Rio San Lorenzo may also have been channeled, based on its unusually straight course slightly south of the limits of urban Teotihuacan.

The presence of waterlogged features and sediments was detected by Florencia Müller in archaeological tunnels excavated in the interior of the Sun Pyramid, associated with an earlier structure built prior to the monumental edifice (Gómez-Chávez 2008); similar conditions were encountered in recent excavations (Sarabia and Sugiyama 2010). Although a definitive explanation for this phenomenon is elusive, inundation water from the Rio San Juan may have permeated parts of the structure.

### URBAN EXPANSION AND VULNERABILITIES IN AGRICULTURAL PRODUCTION

Many aspects of architectural and other material remains of Teotihuacan society evoke in the observer impressions of hierarchy, rigid social control, and even arrogance, with their overwhelming emphasis on detailed planning, control of access to spaces and resources, together with frequent expansion and periodic urban renewal—in a word, aggrandizement. Although investigators earlier suggested that Teotihuacan's residents were primarily agriculturalists who



**6.3.** *Erosion and steam incision near Otumba in the eastern sector of the Teotihuacan Valley. Photo by Julia Pérez-Pérez.*

cultivated the surrounding fields (Millon 1976) and that food resources were unlikely to have been imported (Sanders 1976), emerging evidence for a highly structured elite dominating a large dependent class challenges this view.

Although prehispanic populations here developed canal systems for irrigation and terraces for water control as well as increased soil depth in the piedmont, the population of Teotihuacan surpassed the potential carrying capacity of maize-based agricultural production early in the city's developmental history and ultimately reached approximately 100,000–150,000 inhabitants (Millon 1973). Cowgill (1974) estimated that the city's population reached 50,000–60,000 inhabitants during the Tzacualli phase (AD 1–100), whereas other investigators calculated a regional carrying capacity of between 40,000 and 50,000 (Charlton 1970; Lorenzo 1968; Sanders 1976). Evidently, to support a significant proportion of the population, it was necessary to obtain subsistence products from adjacent valleys in central Mexico: the remainder of the Basin of Mexico, the Toluca Valley to the west, and the Puebla-Tlaxcala region to the east (McClung de Tapia 1987). Carrying capacity may in fact have been much lower than previous estimates, given recent evidence suggesting that the drained fields in the area of springs southwest of San Juan Teotihuacan were of Colonial rather than prehispanic origin (Gazzola 2009; González-Quintero and Sánchez-Sánchez 1991). Thus economic control of adjacent regions was fundamental to the urban support system. Certainly, the inherent risks to agricultural production were unpredictable except in the very short term—as they are in modern rural agricultural zones in central Mexico—and it would have required a highly efficient institutional organization to obtain resources from different areas from year to year as harvests were lost by the effects of weather variability. If population estimates for this phase approximate reality, then Teotihuacan established and maintained this mode of subsistence organization for roughly five–six centuries.

Under these circumstances, removing water-control systems from operation and from the lands they irrigated would appear counterproductive. However, the expansion of the urban zone over time took place at the expense of agricultural production, as demonstrated by discoveries in recent years of buried irrigation canals underlying Teotihuacan structures: at Tlailotlacan (Nichols, Spence, and Borland 1991), Tlajinga (Nichols 1987), and La Ventilla (Gazzola 2009).

In addition to building over earlier irrigation systems, as the city grew, potentially productive agricultural zones were affected in other ways. The analyses of macro- and micro-botanical remains recovered from sediments that constitute the fills for a sequence of seven superimposed structures comprising the Moon Pyramid at the northern extreme of the Street of the Dead indicate that these materials were obtained from agricultural fields. Similarly, macro-botanical remains identified from the Sun Pyramid (McClung de Tapia 1987) and the Feathered Serpent Temple (McClung de Tapia and Rodríguez-Bejarano 1995) are consistent with this hypothesis. Lois Barba (1995) postulated that an immense amount of soil had to have been removed from the surface to pro-

vide construction fill for the major buildings along the Street of the Dead. The detriment to potentially productive agricultural lands is evident.

### CLIMATE CHANGE

No clear evidence has been recovered to date indicating the effect of significant climate change toward the end of the Classic period in the Teotihuacan Valley or elsewhere in the Basin of Mexico. Societies in this region developed under semiarid conditions, particularly in the northeast sector of the basin, and created agro-ecological and social mechanisms to cope with occasional droughts. Although it would be expected that cold events resulting from equatorial shifts of the Intercontinental Convergence Zone could produce droughts in central Mexico (Hassan 2009: 59), this evidence is not straightforward in the archaeological record. The fact that such events occurred, however, is clearly attested in sixteenth-century documents (García-Acosta, Pérez-Zevallos, and Molina del Villar 2003; Kovar 1970).

Results from geoarchaeological research undertaken by Carlos Cordova (1997) in the Texcoco region south of Teotihuacan suggest that the period immediately following the collapse of the Teotihuacan state, known as the Epiclassic period (AD 650/700–900), was characterized by episodes of torrential precipitation together with erosion and catastrophic floods. Comparable evidence has yet to be detected in the Teotihuacan Valley, but it is hoped that ongoing research will permit researchers to determine if similar processes can be identified in the alluvial record. However, drought may be indicated toward the end of the Early Postclassic period (AD 1100–1300), associated in cultural terms with the fall of Tula further north in the Basin of Mexico. The analysis of phytoliths recovered from soils in the Teotihuacan region reports a significant increase in grasses associated with semiarid conditions with respect to those associated with cool-humid conditions corresponding to this time period (McClung de Tapia et al. 2008). Unfortunately, none of the paleoenvironmental studies carried out to date in the lake sediments of the Basin of Mexico provides information for this period.

### MITIGATION

Mitigation involved several aspects. Clearly, water was a vital element at Teotihuacan, as expressed in iconography and ideology, and elaborate rituals associated with water are symbolized in mural representations and burial offerings (Sugiyama and López-Luján 2007). The need to propitiate rains and appease the deities was a fundamental aspect of agricultural practice.

Hydraulic works modified the landscape significantly. Rivers were channeled to avoid flooding, and irrigation systems helped control seasonal

water flow in addition to increasing agricultural productivity. Terraces were constructed to control erosion and increase soil buildup as well as humidity (Sanders, Parsons, and Santley 1979).

The acquisition of a significant proportion of subsistence products from elsewhere provided a solution to the subsistence demands of the growing population, faced with the unpredictability of agricultural risks as well as an apparent decrease in suitable agricultural lands locally. An added benefit, from a political and economic perspective, would have been the establishment and maintenance of control over adjacent regions.

Seasonal flooding undoubtedly increased following the collapse of the Teotihuacan state, reaching a peak during the Colonial period. The remains of Aztec structures in the area of springs southwest of the Classic period city of Teotihuacan are found at depths of 3.5–4.0 m below the modern surface, with some Teotihuacan remains at still greater depths (Cabrera-Castro 2005). The analysis of sediments in the area of Atlatongo, slightly further to the south, revealed approximately 3 m of redeposited sediments (Rivera-Uria et al. 2007).

Overall, it looks as though the landscape of the Teotihuacan Valley was sufficiently resilient to withstand the effects of human impact during the Classic period, during which Teotihuacan developed and prospered. While it is beyond the scope of this chapter to provide a detailed discussion of events at the end of the Late Postclassic period and the initial Colonial period, it is evident that the fragile limit between sustainable productivity and catastrophe represented a threshold that was overshot as a result of numerous interrelated factors. Changes in land use resulting from the introduction of Spanish agricultural techniques, significant indigenous population reduction as a result of numerous epidemics, *congregación* (relocation and concentration of remnant communities partially devastated by disease or situated in rural areas particularly far from Spanish administration centers), and the construction of dams to minimize flooding that affected the colonial capital built on top of the ruins of Aztec Tenochtitlan all contributed to the abandonment of agricultural systems in the piedmont zone and to land degradation in general, as well as to erosion and devastating floods.

The region's ecosystems were severely damaged following the Spanish Conquest. Hydraulic works—based first on frequent repairs of the prehispanic system built to control flooding of Tenochtitlan to avoid contamination by saline waters from Texcoco of the freshwater sector in the south by means of a system of dikes and raised causeways and, later, on the drainage of Lake Texcoco (initiated in 1637)—constantly failed. A document dated to 1555 shows that the Spaniards were conscious of the need to relocate the vulnerable colonial city while at the same time recognizing the impossibility of such an endeavor in the face of exorbitant costs and the opposition of the indig-

enous population (McClung de Tapia 1990). The hydrological system of the Teotihuacan region drained into Lake Texcoco and therefore contributed substantially to the problem of colonial flooding. The fluvial network of the lower Teotihuacan Valley was possibly channeled in the mid-fifteenth century, at the time of Nezahualcoyotl, ruler of Texcoco (Cordova 1997). In 1604 a dam was constructed approximately 3 km south of Acolman in the southern sector of the alluvial plain of the Teotihuacan Valley to control the Rio San Juan and flooding in Mexico City. The effect was to create a large artificial lake; historical documents report continual inundations in this area culminating in the disappearance of several towns, most notably Acolman itself, which was ultimately relocated to its present site in 1781. In 1772 the Augustinian convent of Acolman was submerged in several meters of sediments, and the church of Atlatongo was similarly inundated (*ibid.*; Gamio 1922). Meanwhile, the floods continued, and despite constant repairs to the dam, the attempt to control the seasonal flow of water to Lake Texcoco was fruitless.

#### FUTURE RESEARCH

Attempts to differentiate the landscape impacts of Aztec occupation of the Teotihuacan Valley from the earlier Classic period have been limited by the difficulty of separating Colonial impacts from prehispanic events and processes. Following more than a decade of detailed soil studies and paleoetnobotanical analyses in the region with the objective of reconstructing the Classic period landscape—what was the valley like when the Teotihuacanos occupied it—it has become clear that the initial Colonial period was a time of major demographic upheaval and associated landscape change. Although some authors have suggested that perhaps the central part of the Teotihuacan Valley was not as intensively exploited as other sectors of the Basin of Mexico (Gibson 1964), this information needs to be gathered, in historical archives as well as from paleoenvironmental and geoarchaeological studies. A research effort has recently been undertaken that seeks to look at historical records to trace vegetation change through land-use practices. It is clear that a better understanding of Colonial period processes and events, including the impact of new technologies, socioeconomic organization, and worldview during this period, is necessary to better understand the Late Postclassic and, finally, prior periods such as the Classic.

The social component of the complex society described here is largely unknown, although it can be assumed that adaptability was operational (the city and state endured for approximately five centuries following an earlier century of less complex development). Yet because little is known of the perceptions and expectations of the multiple levels of human groups that occupied the city, beyond speculating about elite control over the rest of the society, there



appears to be no suitable measure of adaptability. Possibly, a potential measure of landscape adaptability following the collapse of Teotihuacan could be the rate at which different vegetation communities were reestablished in relation to the gradual resettlement of the region. It is hoped that ongoing research will contribute to this question.

## CONCLUSION

Many parallels can be drawn with the plight of the modern metropolitan area in the Basin of Mexico. The perpetual effort to control erosion and seasonal flooding continues to this day. The inability of local authorities to impede settlement by marginal populations in high-risk areas in the Federal District and the adjacent State of Mexico, such as steep slopes and *barranca* edges, fosters severe damage from saturated soils and consequent landslides or stream avulsion, causing flash floods. A recent disaster, resulting from atypical torrential rains together with continual showers that lasted for several days in February 2010—traditionally the dry season in this region—affected domestic and commercial properties, mainly in lower-elevation, high-density population centers. Breaches in a drainage canal for wastewater inundated one of the major highways and caused considerable economic losses related to transportation of products between Mexico City and the Gulf Coast (figure 6.4).

Although Intergovernmental Panel on Climate Change projections for the region (Christensen et al. 2007) predict an overall decrease in mean annual precipitation for Central America in general, considerable local variability is expected, especially in mountainous areas such as central Mexico and particularly the Basin of Mexico. Atypical precipitation events, in addition to sporadic torrential showers in summer and seasonal hurricanes, may well continue to affect the region. While it is not difficult to imagine the trauma of prehispanic communities faced with severe flood damage, including erosion, the resilience of those settlements and the landscape in general was far greater than that of modern industrial and service-based urban communities in the Basin of Mexico.

*Acknowledgments.* The research reported in this chapter was supported by the Consejo Nacional de Ciencia y Tecnología, Mexico, as well as the Instituto de Investigaciones Antropológicas, Instituto de Geología, and Dirección General de Asuntos del Personal Académico, Universidad Nacional Autónoma de México (UNAM). The author thanks Diana Martínez-Yrizar, Emilio Ibarra-Morales, and Cristina Adriano-Morán of the Laboratorio de Paleoetnobotánica y Paleoambiente and Jorge Gama-Castro, Elizabeth Solleiro-Rebolledo, and Sergey Sedov of the Instituto de Geología, UNAM.





**6.4.** *Flooding of the major highway between the Gulf Coast and Mexico City and adjacent communities in February 2010. Courtesy, La Jornada.*

## REFERENCES CITED

- Adriano-Moran, C. C.  
 2000 Estudio del Carbón Arqueológico como Indicador de los Cambios en la Vegetación, en el Valle de Teotihuacan, Estado de México. MS thesis, Biology, Facultad de Ciencias, Universidad Nacional Autónoma de México, México, DF.
- Adriano-Moran, C. C., and E. McClung de Tapia  
 2008 Trees and Shrubs: The Use of Firewood in Prehispanic Teotihuacan. *Journal of Archaeological Science* 35: 2927–2936.
- Barba, L. A.  
 1995 El Impacto en la paleogeografía de Teotihuacan. Unpublished PhD dissertation, Facultad de Filosofía y Letras, Universidad Nacional de México, México, DF.
- Cabrera-Castro, R.  
 2005 Nuevas evidencias arqueológicas del manejo del agua en Teotihuacan. El campo y la ciudad. In *Arquitectura and urbanismo: pasado y presente de los espacios en Teotihuacan*, ed. M. E. Ruiz Gallut and J. Torres Peralta. Memoria de la Tercera Mesa Redonda de Teotihuacan, Instituto Nacional de Antropología e Historia, México, DF, pp. 121–161.
- Castilla-Hernández, M. E., and J. D. Tejero-Diez  
 1987 Flora y vegetación del Cerro Gordo (San Juan Teotihuacan) y regiones aledañas, Valle de México, México. *Biotica* 12(4): 231–255.
- Charlton, T. H.  
 1970 Contemporary Agriculture of the Valley. In *The Natural Environment, Contemporary Occupation and 16th Century Population of the Valley*, ed. W. T. Sanders, A. Kovar, T. H. Charlton, and R. A. Diehl. The Teotihuacan Valley Project: Final Report, vol. 1. Occasional Papers in Anthropology 3. Department of Anthropology, Pennsylvania State University, University Park, pp. 253–384.  
 1990 Operation 12, Field 20, Irrigation System Excavations. In *Preliminary Report on Recent Research in the Otumba City-State*, ed. T. H. Charlton and D. L. Nichols. Research Report 3, vol. 1. Mesoamerican Research Colloquium, Department of Anthropology, University of Iowa, Iowa City, pp. 201–212.
- Charlton, T. H., and D. L. Nichols  
 1997 Diachronic Studies of City-States: Central Mexico from 1700 B.C. to A.D. 1600. In *The Archaeology of City-States*, ed. D. L. Nichols and T. H. Charlton. Smithsonian Institution Press, Washington, DC, pp. 169–207.
- Christensen, J. H., B. Hewitson, A. Busuloc, A. Chen, X. Gao, I. Held, R. Jones, R. K. Kolli, W.-T. Kwon, R. Laprise, V. Magaña Rueda, L. Mearns, C. G. Menéndez, J. Räisänen, A. Rinke, A. Sarr, and P. Whetton  
 2007 Regional Climate Projections. In *Climate Change 2007: The Physical Science Basis. Contribution of Working Group 1 to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*, ed. S. Solomon,

- D. Qin, M. Manning, Z. Chen, M. Marquis, K. B. Averyt, M. Tignor, and H. L. Miller. Cambridge University Press, Cambridge, pp. 847–940.
- Cordova, C. E.  
1997 Landscape Transformation in Aztec and Spanish Colonial Texcoco, Mexico. Unpublished PhD dissertation, Department of Geography, University of Texas, Austin.
- Córdova, C. E., and J. R. Parsons  
1997 Geoarchaeology of an Aztec Dispersed Village on the Texcoco Piedmont of Central Mexico. *Geoarchaeology* 12(3): 177–210.
- Cowgill, G. L.  
1974 Quantitative Studies of Urbanization at Teotihuacan. In *Mesoamerican Archaeology: New Approaches*, ed. N. Hammond. University of Texas Press, Austin, pp. 363–396.  
2000 Intentionality and Meaning in the Layout of Teotihuacan, Mexico. *Cambridge Archaeological Journal* 10(2): 358–365.  
2007 The Urban Organization of Teotihuacan, Mexico. In *Settlement and Society: Essays Dedicated to Robert McCormick Adams*, ed. E. C. Stone. Cotsen Institute of Archaeology, University of California, Los Angeles, and the Oriental Institute of the University of Chicago, Chicago, pp. 261–295.
- Evans, S. T.  
2001 Aztec-Period Political Organization in the Teotihuacan Valley. *Ancient Mesoamerica* 12: 89–100.
- Frederick, C. D.  
1997 *Landscape Change and Human Settlement in the Southeastern Basin of Mexico*. Department of Archaeology and Prehistory, University of Sheffield, Sheffield, UK.
- Frederick, C. D., B. Winsborough, and V. S. Popper  
2005 Geoarchaeological Investigations in the Northern Basin of Mexico. In *Production and Power at Postclassic Xaltocan*, ed. E. M. Brumfiel. University of Pittsburgh, Pittsburgh, and INAH, México, DF, pp. 71–115.
- Gamio, M.  
1922 *La Población del Valle de Teotihuacan*. Tomo 1(2). Secretaría de Agricultura y Fomento, Dirección de Antropología, México, DF.
- García-Acosta, V., J. M. Pérez-Zevallos, and A. Molina del Villar  
2003 *Desastres Agrícolas en México. Catálogo Histórico. Épocas prehispánica y colonial (958–1822)*. Fondo de Cultura Económica, Centro de Investigaciones y Estudios Superiores en Antropología Social, México, DF.
- Gazzola, J.  
2009 *Una propuesta sobre el proceso, factores y condiciones del colapso de Teotihuacan*, *Revista Dimensión Antropológica, Instituto Nacional de Antropología e Historia*, available at <http://www.dimensionantropologica.inah.gob.mx/?p=794>; accessed March 30, 2010.
- Gibson, C.  
1964 *The Aztecs under Spanish Rule*. Stanford University Press, Stanford, CA.

- Gómez-Chávez, S.  
 2008 Florencia Emilia Jacobs Müller. Contribuciones a la Arqueología y conocimiento de Teotihuacan. *Arqueología* 38: 206–219.
- González, S., J. C. Jiménez-López, R. Hedges, J. A. Pompa y Padilla, and D. Huddart  
 2006 Early Humans in Mexico: New Chronological Data. In *El Hombre Temprano en América y sus implicaciones en el poblamiento de la Cuenca de México. Primer Simposio Internacional*, ed. J. C. Jiménez-López, S. González, J. A. Pompa y Padilla, and F. Ortiz-Pedraza. Instituto Nacional de Antropología e Historia, México, DF, pp. 67–76.
- González-Quintero, L., and J. E. Sánchez-Sánchez  
 1991 Sobre la existencia de chinampas y el manejo del recurso agrícola-hidráulico. In *Teotihuacan 1980–1982. Nuevas Interpretaciones*, ed. R. Cabrera-Castro, I. Rodríguez-García, and N. Morelos-García. Instituto Nacional de Antropología e Historia, México, DF, pp. 345–375.
- Hassan, F. A.  
 2009 Human Agency, Climate Change, and Culture: An Archaeological Perspective. In *Anthropology and Climate Change: From Encounters to Action*, ed. S. A. Crate and M. Nuttall. Left Coast Press, Walnut Creek, CA, pp. 39–69.
- Hodge, M. G., C. E. Córdova, and C. D. Frederick  
 1996 Los asentamientos prehispánicos y el medio cambiante del sureste de la Cuenca de México. In *Tierra, agua y bosque*, ed. A. Tortolero Villaseñor. Historia y medio ambiente en el México central, Centre Français d'Études Mexicaines et Centraméricaines, Instituto de Investigaciones Dr. José María Luis Mora, Potrerillos Editores, Universidad de Guadalajara, pp. 49–68.
- Kovar, A.  
 1970 The Physical and Biological Environment of the Basin of Mexico. In *The Natural Environment, Contemporary Occupation and 16th Century Population of the Valley*, ed. W. T. Sanders, A. Kovar, T. Charlton, and R. A. Diehl. The Teotihuacan Valley Project: Final Report, vol. 1. Occasional Papers in Anthropology 3. Department of Anthropology, Pennsylvania State University, University Park, pp. 13–67.
- Lamb, A. L., S. González, D. Huddart, S. E. Metcalfe, C. H. Vane, and A.W.G. Pike  
 2009 Tepexpan Palaeoindian Site, Basin of Mexico: Multi-Proxy Evidence for Environmental Change during the Late Pleistocene–Late Holocene. *Quaternary Science Reviews* 28: 2000–2016.
- Lorenzo, J. L.  
 1968 Clima y agricultura en Teotihuacan. In *Materiales para la arqueología de Teotihuacan*, ed. J. L. Lorenzo. Instituto Nacional de Antropología e Historia, México, DF, pp. 53–72.
- Lounejeva-Baturina, E., P. Morales-Puente, H. V. Cabadas-Báez, E. Cienfuegos-Alvarado, S. Sedov, E. Vallejo-Gómez, and E. Solleiro-Rebolledo  
 2006 Late Pleistocene to Holocene Environmental Changes from  $\delta^{13}\text{C}$  Determinations in Soils at Teotihuacan, Mexico. *Geofísica Internacional* 45(2):

85–98.

Lounejeva-Baturina, E., P. Morales-Puente, E. Cienfuegos-Alvarado, S. Sedov, and E. Solleiro-Rebolledo

2007 Late Quaternary Environment in the Teotihuacan Valley, Mexico, Inferred from  $\delta^{13}\text{C}$  in Soils. *SAS Bulletin* 30(1): 6–11.

Manzanilla, L.

1997 The Impact of Past Climate Change on Past Civilizations: A Revisionist Agenda for Future Research. *Quaternary International* 43–44: 153–159.

Manzanilla, L., ed.

2005 *Reacomodos demográficos. Del Clásico al Posclásico en el Centro de México*. Instituto de Investigaciones Antropológicas, Universidad Nacional Autónoma de México, México, DF.

McClung de Tapia, E.

1987 Agriculture and the Formation of the Teotihuacan State. In *Studies in the Neolithic and Urban Revolutions: The V. Gordon Childe Colloquium, Mexico, 1986*, ed. L. Manzanilla. BAR International Series 349, Oxford, England, pp. 353–364.

1990 Ecología, agricultura y ganadería durante la Colonia, Medicina novohispana. In *Historia General de la Medicina en México*, tomo 2. Siglo 16. **{AU: Please provide the editor's name.}** Academia Nacional de Medicina, Universidad Nacional Autónoma de México, México, DF, pp. 60–77.

2009 *Los ecosistemas del Valle de Teotihuacan a lo largo de su Historia, Teotihuacan: Ciudad de los Dioses*. Instituto Nacional de Antropología e Historia, México, DF.

McClung de Tapia, E., H. Cabadas Baez, E. Solleiro, J. Gama-Castro, and E. Vallejo

2008 Phytoliths of Soils and Paleosols of the Teotihuacan Valley, Mexico. In *Interdisciplinary Nuances in Phytolith and Other Microfossil Studies*, ed. M. P. Babor and A. Korstanje. BAR International Series, Oxford, England, pp. 67–76.

McClung de Tapia, E., I. Domínguez-Rubio, J. Gama-Castro, E. Solleiro-Rebolledo, and S. Sedov

2005 Radiocarbon Dates from Soil Profiles in the Teotihuacan Valley, Mexico: Indicators of Geomorphological Processes. *Radiocarbon* 47(1): 159–175.

McClung de Tapia, E., and R. Rodríguez-Bejarano

1995 *Botanical Remains from the Temple of Quetzalcoatl*. Informe Técnico 2. Laboratorio de Paleoetnobotánica y Paleoambiente, Instituto de Investigaciones Antropológicas, Universidad Nacional Autónoma de México, México, DF.

McClung de Tapia, E., E. Solleiro-Rebolledo, J. Gama-Castro, J. L. Villalpando, and S. Sedov

2003 Paleosols in the Teotihuacan Valley, Mexico: Evidence for Paleoenvironment and Human Impact. *Revista Mexicana de Ciencias Geológicas* 20(30): 270–282.

McClung de Tapia, E., and H. Tapia-Recillas

- 1996 *Statistical Analysis Using GIS: Application to the Study of Prehispanic Settlement Location in the Teotihuacan Region, Mexico. Archaeological Applications of GIS.* Proceedings of Colloquium II, ed. I. Johnson and N. North. UISPP 13th Congress, Forlì, Italy. Sydney University Archaeological Methods Series 5, Sydney, Australia.
- McClung de Tapia, E., J. L. Villalpando, E. Solleiro, and J. E. Gama  
 2004 Prácticas agrícolas prehispánicas en el valle de Teotihuacan, Estado de México: evidencias químicas y morfológicas. In *Homenaje a Jaime Litvak*, ed. A. Benavides, L. Manzanilla, and L. Mirambell. Instituto Nacional de Antropología e Historia, Instituto de Investigaciones Antropológicas, Universidad Nacional Autónoma de México, México, DF, pp. 63–80.
- Millon, R.  
 1970 Teotihuacan: Completion of Map of Giant Ancient City in the Valley of Mexico. *Science* 170(3962): 1077–1082.  
 1973 *Urbanization at Teotihuacan, Mexico*, vol. 1: *The Teotihuacan Map*. University of Texas Press, Austin.  
 1976 Social Relations in Ancient Teotihuacan. In *The Valley of Mexico: Studies in Pre-Hispanic Ecology and Society*, ed. E. R. Wolf. School of American Research, University of New Mexico Press, Albuquerque, pp. 205–248.  
 1988 The Last Years of Teotihuacan Dominance. In *The Collapse of Ancient States and Civilizations*, ed. N. Yoffee and G. L. Cowgill. University of Arizona Press, Tucson, pp. 102–164.
- Nichols, D. L.  
 1987 Prehispanic Irrigation at Teotihuacan, New Evidence: The Tlajinga Canals. In *Teotihuacan. Nuevos Datos, Nuevas Síntesis, Nuevos Problemas*, ed. E. McClung de Tapia and E. C. Rattray. Instituto de Investigaciones Antropológicas, Universidad Nacional Autónoma de México, México, DF, pp. 133–160.
- Nichols, D. L., M. Spence, and M. Borland  
 1991 Watering the Fields of Teotihuacan: Early Irrigation at the Ancient City. *Ancient Mesoamerica* 2: 119–129.
- Pérez-Pérez, J.  
 2003 La agricultura en Teotihuacan. Una forma de modificación al paisaje. Unpublished master's thesis, Anthropology, Facultad de Filosofía y Letras, Universidad Nacional Autónoma de México, México, DF.
- Plunket, P., and G. Uruñuela  
 2006 Social and Cultural Consequences of a Late Holocene Eruption of Popocatepetl in Central Mexico. *Quaternary International* 151: 19–28.  
 2008 Mountain of Sustenance, Mountain of Destruction: The Prehispanic Experience with Popocatepetl Volcano. *Journal of Volcanology and Geothermal Research* 170(1–2): 111–120.
- Rattray, E., J. Litvak, and C. Diaz, eds.  
 1981 *Interaccion cultural en Mexico central*. Instituto de Investigaciones Antropológicas, Universidad Nacional Autónoma de México, México, DF.
- Rivera-Uria, M. Y., S. Sedov, E. Solleiro-Rebolledo, J. Pérez-Pérez, E. McClung, A.



- González, and J. Gama-Castro  
 2007 Degradación ambiental en el valle Teotihuacan: evidencias geológicas y paleopedológicas. *Boletín de la Sociedad Geológica Mexicana* 59(2): 203–217.
- Rzedowski, J., G. Guzmán, A. Hernández, and C. Muñiz  
 1964 Cartografía de la vegetación de la parte norte del valle de México. *Anales de la Escuela Nacional de Ciencias Biológicas* 13: 31–57.
- Sanders, W. T.  
 1965 *The Cultural Ecology of the Teotihuacan Valley*. Department of Sociology and Anthropology, Pennsylvania State University, University Park.  
 1976 The Agricultural History of the Basin of Mexico. In *The Valley of Mexico: Studies in Pre-Hispanic Ecology and Society*, ed. E. R. Wolf. School of American Research, University of New Mexico Press, Albuquerque, pp. 101–159.
- Sanders, W. T., J. R. Parsons, and R. S. Santley  
 1979 *The Basin of Mexico: Ecological Processes in the Evolution of a Civilization*. Academic Press, New York.
- Sarabia, A., and S. Sugiyama  
 2010 *Informe de los trabajos realizados durante la temporada 2008–2009. Programa de Conservación e Investigación en el Complejo Arquitectónico de la Pirámide del Sol, Teotihuacan*. Instituto Nacional de Antropología e Historia, Coordinación Nacional de Arqueología, Dirección de la Zona Arqueológica de Teotihuacan, México, DF.
- Sedov, S., S. Lozano-García, E. Solleiro-Rebolledo, E. McClung de Tapia, B. Ortega-Guerrero, and S. Sosa-Najera  
 2010 Tepexpan Revisited: A Multiple Proxy of Local Environmental Changes in Relation to Human Occupation from a Paleolakeshore Section in Central Mexico. *Geomorphology*, doi:10.1016/j.geomorph.2009.09.003; accessed November 26, 2009.
- Siebe, C., M. Abrams, J. L. Macías, and J. Obenholzer  
 1996 Repeated Volcanic Disasters in Prehispanic Times at Popocatepetl, Central Mexico: Past Key to the Future? *Geology* 24(5): 399–402.
- Solleiro-Rebolledo, E., S. Sedov, E. McClung de Tapia, H. Cabadas, J. Gama-Castro, and E. Vallejo-Gómez  
 2006 Spatial Variability of Environmental Change in the Teotihuacan Valley during the Late Quaternary: Paleopedological Inferences. *Quaternary International* 156–157: 13–31.
- Sugiyama, S., and L. López-Luján  
 2007 Dedicatorial Burial/Offering Complexes at the Moon Pyramid, Teotihuacan. *Ancient Mesoamerica* 18: 127–146.
- Walker, B., C. S. Holling, S. R. Carpenter, and A. Kinzig  
 2004 Resilience, Adaptability and Transformability in Social-Ecological Systems. *Ecology and Society* 9(2): 5, available at URL:<http://www.ecologyandsociety.org/vol9/iss2/art5>; accessed July 5, 2005.



### STATEMENT FOR POLICY MAKERS AND THE DISASTER MANAGEMENT COMMUNITY

The Basin of Mexico, where modern Mexico City and its surrounding metropolitan area are located, has been populated by relatively dense urban centers since prehispanic times, as early as 100 BC. Therefore many of the problems inherent to sustaining large populations in areas where natural and anthropogenic hazards are present can be traced back several millennia. Factors such as volcanic eruptions, tectonic events, irregular precipitation, flooding, and erosion are all interrelated and exacerbated by deforestation and intensive agricultural activities; their impact has been felt since the earliest settlements. Needless to say, increasing population density in certain areas through time, in addition to decline and abandonment in others, has also contributed to significant landscape degradation.

Prehispanic communities in the region, such as Teotihuacan, confronted these risks by developing and maintaining complex agro-ecological systems, hydraulic works, and strategically located settlements close to terraces in rural zones at higher elevations to control erosion. Many of these facilities were abandoned or significantly modified following the Spanish Conquest in the sixteenth century. The intentional drainage of the lake system during the Colonial period is perhaps the most drastic example of this landscape modification. What has ensued over the past four centuries is a complete transformation of the landscape, paralleled by population increase, resource depletion, and increased risk of natural hazards. Dense urban populations are concentrated in precarious, unstable areas where risks were always present but are now greater because of irregular urban development. Central Mexico has always been at risk, but it will undoubtedly suffer an increase in the irregularity and unpredictability of hazards, subjecting modern and future populations to more frequent disasters along with their economic and social consequences. Therefore key lessons from this research show that the Teotihuacan landscape was sufficiently resilient during the Classic period when the ancient city developed and prospered. This resilience of prehispanic settlement strategies and their methods of landscape management should inform current urban planning strategies for modern industrial and service-based communities in the Basin of Mexico.