Economies and Polities in the Aztec Realm

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Economies and Polities in Aztec-Period Morelos

Ethnohistoric Overview

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The core area of the Aztec realm, the Basin of Mexico, has been the focus of the vast majority of scholarly research on conquest-period Central Mexico. This is due partly to the interests of scholars in the political and cultural center of the Aztec empire and partly to the far greater abundance of documentary source material for the Basin of Mexico as compared with other areas. But if we are to understand fully the nature of the Aztec core zone, there are two compelling reasons to expand our perspective to include areas outside of the Basin of Mexico. First, detailed studies of economic and political organization in other areas are needed to evaluate the significance and uniqueness of the Basin of Mexico. Were well-known Aztec institutions such as city-states and market systems limited to the Aztec core, or were they more widely distributed? Second, more data from other regions of Central Mexico are needed in order to better understand the spatial context of Aztec imperial expansion and other processes of interregional interaction.

In this paper I review ethnohistoric information on economies and polities in Late Postclassic Morelos, the area immediately south of the Basin of Mexico. I argue that most of the major political and economic institutions in the two areas were quite similar. The city-state was the dominant political institution, population densities were high, intensive agriculture was common, and there

was a high volume of exchange through both market systems and hierarchical tribute networks. The greatest difference between Morelos and the Basin of Mexico was their relative positions in the Aztec empire as conquered and conqueror, province and core. Morelos was the first area outside of the Basin of Mexico to be conquered by the expanding Aztec empire, a development explained by its proximity, its distinctive resources, a high level of political development, and a history of trade and interaction between the two areas.

Although the Aztec empire clearly was an important force in Central Mexico, it was but one institution among many with economic and political influence in Morelos. Several previous studies of Late Postclassic Central Mexico have begun with the Aztec empire and proceeded to discuss conquered areas as if their role as imperial provinces was their most salient characteristic (e.g., Barlow 1949; Davies 1973; Hassig 1988). When analysis is focused on local patterns in the Aztec provinces, however, it becomes clear that many of the key political and economic processes were only marginally influenced by the empire (see Berdan et al. 1994). Provincial areas need to be analyzed on their own terms, and this paper contributes to such a task for the region that today is the Mexican state of Morelos.

POLITICAL AND TERRITORIAL ORGANIZATION

At the time of the Spanish conquest in 1519, the territory of Morelos was divided into nearly 70 city-states. Although conquest-period documentation is scanty, existing sources indicate that the Morelos city-states were smaller than their better-known counterparts in the Basin of Mexico but similar in organization (for Morelos city-states, see Gerhard 1970a, 1970b, 1975, or Carrasco 1964b; Basin of Mexico city-states are discussed by Gibson 1964:32-57, Hodge 1984, Hodge, chap. 2, and Licate 1980). City-states were ruled by a *tlatoani* of the noble class who resided in the capital settlement, where the administrative, religious and (to a lesser extent) economic functions of the polity were concentrated. The hereditary noble class, more or less synonymous with the city-state government, was supported primarily by tribute in labor and goods from commoners, most of whom lived in rural villages and hamlets scattered throughout the polity. Of fundamental importance to the power and status of the Morelos nobility was their control over the irrigated farmland of the city-state (Carrasco 1968, 1972, 1976a).

Most of the Morelos city-states were organized into six larger conquest-states: Quauhnahuac, Yauhtepec, Huaxtepec, Totolapan, Yacapitztlan and Ocuituco. Tepoztlan was an independent city-state, as were several polities

in the Zacualpan region. As discussed in Smith (1986), conquest-states were formed when one city-state managed to conquer adjacent polities and institute tribute payments. The subject city-states retained a relatively high degree of economic and political autonomy, however. Local political authority continued to be vested in the individual *tlatoque*, and there is no indication that the conquest-states were involved in the organization or direction of economic production at the local level (except within their own home territory). These conquest-states were actively involved in many external wars and conquests during the Late Postclassic period. For example, Quauhnahuac waged wars with Malinalco, Cohuixco, Tlachco (Taxco), and other nearby polities (Acuña 1984-1987:v.7:127; Alva Ixtlilxochitl 1975:v.1:473; Anales de Tlatelolco 1948:57); Yacapitztlan sacrificed victims captured in wars with Mixtec states (Acuña 1984-1987:v.6:218); and Huaxtepec, Tetela and Totolapan all fought battles with polities in the Puebla-Tlaxcala Valley (Acuña 1984-1987:v.6:203, v.7:267, v.8:162). The Morelos conquest-states also warred among themselves (Acuña 1984-1987:v.6:188; Torquemada 1969:v.1:149), and their territorial extent in 1519 was the result of several centuries of expansion and conquest (O'Mack 1985; Smith 1986).

My reconstruction of the Morelos city-states and conquest-states is portrayed in figure 12.1; the polities are listed in table 12.1. A discussion of the methods and data employed may be found in Smith (1983:120-128). Briefly, I follow Gerhard's (1970a) lead in territorial reconstruction, although my reliance upon a 1532 listing of Cortés's Morelos encomiendas (Cortés 1869: 560f) leads to the designation of more city-states than Gerhard finds. The polities of Morelos were incorporated into the Triple Alliance empire under the tributary provinces of Quauhnahuac and Huaxtepec (*Codex Mendoza* 1992:f.23r-25r). The former coincided with the Quauhnahuac conquest-state, while the latter included the independent states of Huaxtepec, Yauhtepec, Tepoztlan, Totolapan and Yacapitztlan. This situation was quite common, as a source from 1532 reveals:

> Mutizuma ponía un calpisque o mayordomo en una provincia, y muchas cabezeras y pueblos, que eran por sí, contribuían a do[nde] estaba el calpisque, y estos no se deben tener por subjectos. (Ramírez de Fuenleal 1870a:236)

> [Mutizuma [Motecuhzoma, or any Mexican emperor] would install a *calpixque* or tribute-collector in a province, and many independent capitals and towns would deliver tribute to the calpisque center. These capitals and towns should not be viewed as subjects [of the calpisque center].] (author's translation)

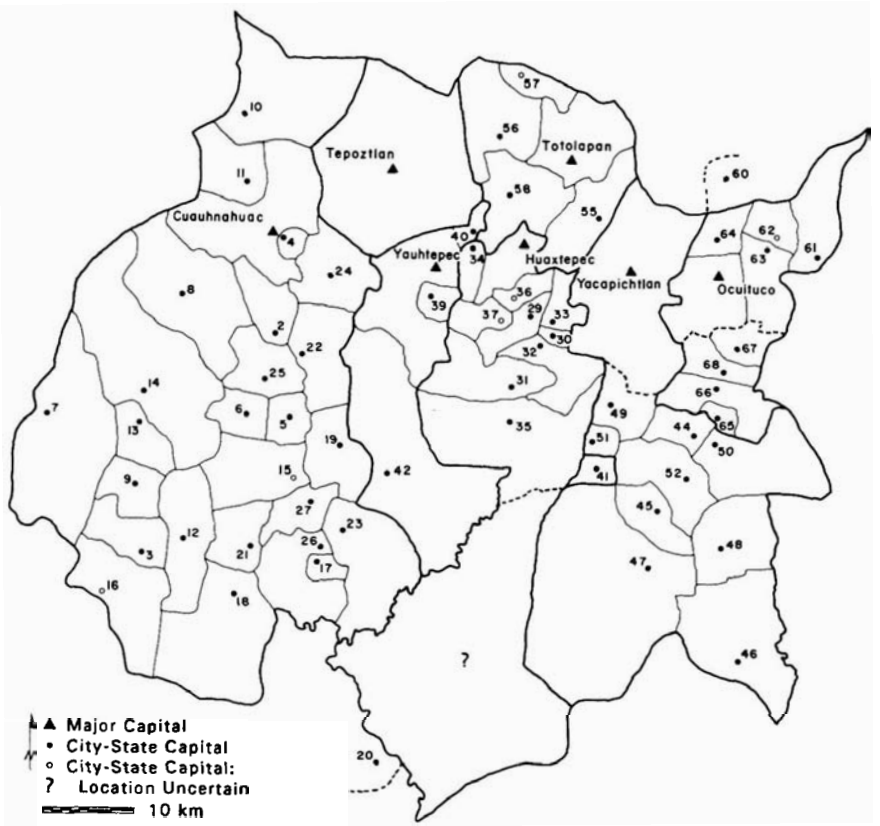

Fig. 12.1. Territorial organization in Late Postclassic Morelos. City-state boundaries are thin lines; city-state capitals are circles. Conquest-state boundaries are heavy lines; conquest-state capitals are triangles. See table 12.1 for the key to polity names.

In the case of Huaxtepec, we are explicitly told that although a Triple Alliance *calpixque* was stationed in the town, "asimismo ellos tenían otro señor natural [i.e., *tlatoani*] a quien obedecían y reconocían por señor" [these also had a separate local lord [i.e., *tlatoani*] whom they obeyed and recognized as lord] (Acuña 1984-1987:v.6:201). Thus the tributary provinces of the Triple Alliance empire were somewhat arbitrary units that did not necessarily correspond to local political units, and descriptions of these provinces (e.g., Barlow 1949) cannot be used to reconstruct local patterns of territorial organization (see Hicks [1984a] or Berdan et al. [1994] for discussion of this issue). Quauhnahuac and the Morelos polities in the

Table 12.1 Morelos polities in 1519 (see fig. 12.1 for locations)

No. City-State	Modern Town
Quauhnahuac Conquest-State	
1. Quauhnahuac	Cuernavaca
2. Acatlipac	Acatlipa
3. Amacoztitlan	Amacuzac
4 Amatitlan	Amatitlan, Cuernavaca
5. Atlicholoayan	Atlacholoaya
6. Atlpoyecan	Alpuyeca
7. Coatlan	Coatlan del Río
8. Cohuintepec	Cuentepec
9. Quauhchichinola	Cuachichnola
10. Huitzillapan	Huitzilac
11 Yztepec	Ahuacatitlan
12. Yztlan	Puente de Ixtla
13. Mazatepec	(same)
14. Miacatlan	(same)
15 Molotlan	(unidentified; Tetelpa?)
16. Ocpayucan	(unidentified)
17. Panchimalco	(same)
18. Tehuixtlan	Tehuixtla
19. Temimiltzinco	(same)
20. Teocaltzinco	Teocalcingo, Gro.
21. Tequesquitenco	(same)
22. Tezoyucan	Tezoyuca
23. Tlaquiltenanco	(same)
24. Xiuhtepec	Jiutepec
25. Xochitepec	(same)
26. Xoxotlan	Jojutla
27. Zacatepec	(same)
Huaxtepec Conquest-State	
28. Huaxtepec	Oaxtepec
29. Ahuehuepan	(none)
30. Amiltzinco	(same)
31. Anenecuilco	(same)
32. Quauhtlan	Cuautla
33. Quauhtlixco	Cuautlixco
34 Yzamatitlan	Itzamatitlan
35. Olintepec	Olintepec
36. Xochimilcatzinco	(unidentified)
37. Zonpanco	(unidentified)
Yauhtepec Conquest-State	
38. Yauhtepec	Yautepec
39. Atlhuelican	Atlihuayan
40. Coacalco	Oacalco
41. Huitzillan	Huitzililla
42. Tlaltizapan	(same)
Yacapitztlan Conquest-State	
43. Yacapitztlan	Yecapixtla
44. Amayucan	Amayuca
45. Atotonilco	(same)
46. Ayoxochapan	Axochiapan
47. Tecpantzinco	Tepalcingo
48. Tetellan	Tetelilla
49. Tlayacac	(same)
50. Xantetelco	Jantetelco
51. Xaloztoc	(same)
52. Xonacatepec	Jonacatepec
Tepoztlan	
53. Tepoztlan	(same)
Totolapan Conquest-State	
54. Totolapan	(same)
55. Atlatlauhcan	(same)
56. Nepopoalco	(same)
57. Tehuizco	(unidentified)
58. Tlayacapan	(same)
Ocuituco Conquest-State	
59. Ocuituco	(same)
60. Acatzinco	Ecatzingo, Mex.
61. Hueyapan	(same)
62 Nepopoalco	(unidentified; Huejotengo?)
63. Tetellan	Tetela del Volcan
64. Xumiltepec	Jumiltepec
(southern group)	
65. Quauhzolco	Huazulco
66. Temoac	(same)
67. Tlacotepec	(same)
68. Zacualpan	(same)

Aztec province of Huaxtepec were integrated into the Triple Alliance empire through both official channels (their status and responsibilities as tributary provinces) and more informal mechanisms like trade and elite interaction (Smith 1986).

The Ocuituco area in the northeast corner of Morelos stands apart from the other Morelos polities; its city-states were subject to Quauhquechulan (in modern Puebla) in 1487 (Durán 1967:v.2:334), and later to Xochimilco at the time of Spanish conquest (Acuña 1984-1987:v.7: 265, 267). Gerhard (1970b) discusses the territorial extent and political organization of the Ocuituco area, whose towns are not included in the *Codex Mendoza* (1992) or the 1532 encomienda list (Cortés 1869:556f). These polities served the Aztec empire as client states and they formed a "strategic province" of the empire (Berdan et al. 1994; Berdan, chap. 11). Although they paid only a modest tribute in goods (Acuña 1984-1987:v.7:267; Gerhard 1970b:110), these towns helped to maintain the frontier with Tlaxcala by fighting wars. The *Relación Geografíca* states, "era ... como frontera contra otras provincias" [this area was like a frontier against other polities] (Acuña 1984-1987:v.7:267).

DEMOGRAPHY AND SETTLEMENT PATTERNS

Early Colonial Spanish visitors to Morelos reported a dense population distributed in a relatively dispersed fashion, a pattern also found in the Basin of Mexico. For example, Fray Pedro Delgado, a Dominican priest writing in 1540, described the Huaxtepec areas as follows:

> En aquel tiempo estaban estas sierras, sus faldas y valles, pobladas de millares de almas que vivían, sugun su costumbre en varias rancherias divididas, a corta distancia las unas de las otras ... no había poblazon formada porque cada uno vivía donde tenía su maíz o le parecía. (Cruz y Moya 1954/55:v.2:133)

> [In those times these hills and valleys were populated with thousands of souls who lived, following their custom, in many scattered hamlets a short distance from one another ... there were not population centers [towns] because each person lived where he had his cornfields, or so it appeared.] (author's translation)

This description was part of an argument in favor of the *congregación* policy of gathering the rural population into nucleated towns (see Gerhard 1977) and thus may overemphasize the dispersed nature of settlement; other sources speak of "muchas y grandes pueblos de muy suntuoso edificios" [many and large towns with very sumptuous buildings] in Morelos (Códice Ramírez 1944:23). Nevertheless, the general picture of a dense, relatively dispersed population is supported by both Early Colonial census data and the archaeological record (see Williams, chap. 3, for a similar situation in the Basin of Mexico).

Methods and Models of Population Estimation

Population levels for Morelos in 1519 may be estimated from a number of published census documents from before 1575. For most entities, I provide two population estimates. The first set of estimates, labeled Model 1, rest upon the assumption that the post-1519 demographic decline was constant until 1568. I employ a rate of decline from Sanders's (1970) detailed and extensive analysis of Central Mexican historical demography. Sanders (1970: 427-430) suggests a 1519-1568 population loss of 77.3% for Morelos. Thus population declined by a factor of 4.405 in 49 years, or an average annual decline of 0.090. The assumption of a steady decline rate produces conversion factors of 1.62 for 1537 census data, 2.61 for 1548, and 2.88 for 1551. The population decline after 1568 was probably somewhat slower (Gerhard 1975), so I use a conversion factor of 5.0 for 1571 census figures in place of the constant-decline factor of 5.58 for 1571.

Model 2 uses the depopulation model derived for the Basin of Mexico by Whitmore's (1991, 1992) quantitative simulation study which employs information on the timing of the major epidemics. This is more realistic than the constant-decline model, but its applicability to Morelos needs to be confirmed. Conversion factors for the years of Morelos census data were obtained by measurements on Whitmore's most likely simulation graph (1991:478). These conversion factors are 1.90 for 1537, 3.33 for 1548, 3.64 for 1551, and 5.25 for both 1568 and 1571. This model produces slightly higher population estimates than the constant-decline model, but the two models are in general agreement for most estimates (see table 12.2 below). An alternative population decline model (Gerhard 1975:343) produces estimates for 1519 that are considerably higher than the two models presented here, but Gerhard does not provide sufficient detail to construct a third model.

In many cases the Colonial census figures include only the commoner population, since nobles were exempt from tribute payments. Where this appears to be the case, I add an additional two percent to the population to account for the Aztec-period nobility. While published sources are not very informative on the size of the Aztec nobility, we do know that in Yacapitztlan, nobles comprised just under one percent of all household heads (Carrasco 1976a:110), and noble households were larger than commoner households. For example, census data from 1537 show that the mean household size was 5.4 in Tepoztlan and 7.4 in five other Morelos communities at lower elevations (Carrasco 1964b:377), while noble households had as many as 15 to 23 members (Carrasco 1964a:190, 1972:232). Thus it is not unreasonable to use two percent as an estimate of the proportion of nobles in Late Postclassic Morelos.

A detailed census of Yacapitztlan from 1561 (*Visita, tasación y cuenta* 1946; see Sanders 1971:20) is not used here because of problems in separating the immediate estancias of Yacapitztlan from those in the more distant Tlalnahua area of southeast Morelos. It does appear, however, that the figures from this document yield population estimates for 1519 considerably lower than the other sources. Further research on the historical demography of Morelos is urgently needed to clarify such issues and provide more solid population figures than the provisional estimates presented here.

Population Estimates

My population estimates are listed in table 12.2, where all figures are rounded to the nearest hundred. The sources, assumptions, and calculations used to produce the population estimates listed in the notes to table 12.2. Sanders (1970:430) estimates the total population of Morelos in A.D. 1519 to have been 672,500 (table 12.2). This yields an areal density of 136 persons/km^2 (this is the midpoint of Sanders's range of 119-152 persons/km^2), somewhat lower than his estimate of 150-168 persons/km^2 for the Basin of Mexico at the same time. Gerhard (1975:343) furnishes a figure of 850,000 for Morelos in 1519 but does not explain how he arrives at this number. My application of Models 1 and 2 to the 1571 census data published by Gerhard (1975:344) yields total population estimates that more closely agree with Sanders's figures (table 12.2, calculation C).

The various estimates for the populations of the conquest-states in table 12.2 are in relative agreement. The population estimates for the capitals of conquest-states are in line with the sizes of the largest Aztec cities in the Basin of Mexico (apart from Tenochtitlan), which ranged from 10,000 to 30,000 inhabitants (Hodge, chap. 2; Sanders et al. 1979:154; Smith et al. 1994). Although the size of the city of Quauhnahuac impressed early Spanish visitors (e.g., de Solis 1924:v.2:230; Ponce 1873:v.1:197; *Títulos de Cuernavaca* 1947:222), the other Morelos capital cities did not excite much comment.

Figures for the populations of city-states are quite variable, with three clusters of values. The first four cases in table 12.2 fall between 7,500 and 6,000 persons; the next three estimates (from the same 1548 census data) range from 10,000 to 14,500 persons, and the estimates for the local city-state populations of the five capital polities range from 16,500 to 120,600. It is reasonable to expect that the densest populations in a conquest-state will occur near the capital city, but these later estimates appear to be out of line. Population estimates for city-state capitals all fall between 1,500 and 2,500 persons (table 12.2), somewhat smaller than the Basin of Mexico city-state capitals (estimated at 3-4,000 inhabitants [Sanders et al. 1979:54]); this size differential makes sense given the slightly lower population densities and lower level of economic complexity in Morelos. Comparison of these last two sets of figures reveals that the average city-state capital contained about 20-40% of the population of the total city-state territory, a figure comparable to Sanders's estimate that one-third of the population of the Basin of Mexico lived in towns and cities in 1519 (1970:449-450) and Hicks's (1982, 1984b) specific analysis of Texcoco. Similarly, ethnohistoric documents from nearby parts of Guerrero report that 30 to 50 percent of the population of city-states resided in the capital towns (Acuña 1984-1987:v.6:111-112; García Pimentel 1904:102-103). Documentary data assembled by Hodge (chap. 2), however, show a wider variation in the degree of population nucleation in Basin of Mexico polities.

The relatively small size of the Morelos city-state capitals, as estimated from sixteenth-century census data, is supported by recent archaeological research at Late Postclassic sites in western Morelos. As discussed in Smith (1989), most of the archaeologically-known city-state capitals are small sites (15 ha or less) with central civic and religious architecture but little evidence of craft specialization (see Mason [1980] for a study of one of these sites, Coatlan Viejo).

In sum, these population estimates paint a picture of a dense, widely-distributed population at the time of Spanish conquest. Although this is not the place to enter the debate over the total size of the native population of the New World when first encountered by Europeans (e.g., Dobyns 1993; Henige 1992), the above data are in closer accord with the lower central Mexican estimates of Sanders (1970) and Whitmore (1992) than with the unrealistically high estimates of Borah and Cook (1963).

Table 12.2 Population estimates for 1519

Entity	Population		Calculation	Census Year
	Model 1	Model 2		
Entire Modern State				
	672,500	--	A	1568
	850,000	--	B	?
	677,600	711,500	C	1571
Conquest-States				
Quauhnahuac	253,100	302,000	D	1568
"	207,600	217,900	E	1571
"	220,500	278,700	F	1551
Tepoztlan	33,000	39,400	D	1568
"	45,100	47,300	E	1571
Yauhtepec	58,900	70,100	D	1568
"	79,800	83,800	E	1571
Totolapan	65,600	78,200	D	1568
"	79,600	83,500	E	1571
Huaxtepec	97,000	115,800	D	1568
"	62,800	65,900	E	1571
Yacapitztlan	62,700	74,800	D	1568
"	54,200	56,900	E	1571
Tlalnahua states*	47,800	61,600	D	1568
"	48,200	50,600	E	1571
Ocuituco	33,100	39,500	D	1568
"	47,800	50,200	E	1571
Zacualpan states*	20,300	25,900	H	1548
"	21,000	25,100	D	1568
	27,000	28,400	E	1571
Capital Cities				
Quauhnahuac	31,800	40,200	G	1551
Tepoztlan	7,600	9,500	G	1551
"	6,500	7,600	K	1537
Yauhtepec	13,300	16,800	G	1551
Huaxtepec	5,500	7,000	G	1551
Yacapitztlan	15,800	20,000	G	1551

(continued)

Note: The various calculations used to estimate prehispanic population are derived as follows:

A. The midpoint of Sanders's (1970:430) range of estimates for the 1519 population of Morelos. This figure is based upon census data from 1568 presented by Sanders (1970).

B. Gerhard's (1975:345) figure for the 1519 population of Morelos. He does not discuss its origin or derviation.

C. The sum of the populations of the Late Postclassic conquest states as derived from the 1571 Ovando census; the data are presented in Gerhard (1975:344). The 1571 population is multiplied by the decline rate and the noble conversion factor (see text) to produce the total population in 1519.

D. The 1568 census data are published in Sanders (1970:415-416). I have aggregated the totals in terms of the 1519 political units and applied the 1568 conversion factors.

-- Census data from the Ovando reports of 1571(Gerhard 1975:344), with application of the conversion for a 2 percent noble population.

Table 12.2 (continued)

Entity	Population		Calculation	Census Year
	Model 1	Model 2		
City-States				
Zacualpan	2,600	3,300	H	1548
Tlacotepec	2,700	3,500	H	1548
Quauhzolco	3,200	4,100	H	1548
Coatlan	4,900	6,200	H	1548
Tetellan	11,200	14,300	H	1548
Xumiltepec	11,400	14,500	H	1548
Temoac	10,100	12,800	H	1548
Quauhnahuac	**95,400**	**120,600**	**I**	**1551**
Tepoztlan	22,800	28,500	I	1551
Yauhtepec	39,900	50,400	I	1551
Huaxtepec	16,500	21,000	I	1551
Yacapitztlan	47,400	60,000	I	1551
Mean, Quauhnahuac area	5,100	5,600	J	--
Mean, Yauhtepec area	7,400	6,600	J	--
Mean, Huaxtepec area	7,000	7,700	J	--
Mean, Yacapitztlan area	1,200	700	J	--
City-State Capitals				
Quauhchichinola	1,600	1,900	K	1537
Molotlan	1,600	1,900	K	1537
Panchimalco	2,000	2,300	K	1537
Huitzillan	2,400	2,900	K	1537

F. Based upon Carrasco's (1976a:193) publication of a 1551 census figure of 13,899 commoner household heads for all of Curenavaca and its subjects (i.e., the Cuauhnahuac conquest-state).

G. Urban population figures are based on a separate 1551 encomienda census reported by Riley (1973:133), who gives total urban populations plus breakdowns by sex and age. Riley's figures appear to represent the total population of the city-state associated with each capital (including rural areas) and therefore must be reduced in order to reach estimates of strictly urban population levels. Based upon Hick's analysis of Texcoco (1982, 1984b), I assume that one-third of the total population of a city-state resided in the urban core; thus the estimates for 1519 are divided by three in order to reach the figures shown in the table. The total polity populations are included under calculation I below.

H. Population data from the *Suma de visitas* ... (1905) of ca. 1548. This document gives the number of houses for Ocuituco (p.167) and Coatlan (p. 80), and the number of *"hombres"* or *"tributarios"* for the other towns. The census figures are multiplied by a household size of 5.4 persons, and then the 2 percent noble conversion is applied. It is not certain if this Coatlan pertains to the Morelos city-state capital or to another town of the same name.

I. City-state populations from the 1551 encomienda census discussed under calculation G above.

J. Mean city-state populations derived by taking the mean of the different estimates for the population of the conquest-state capital and dividing it by the number of subject city-states in the conquest-state.

K. Population data from the 1537 town census lists analyzed by Carrasco (1964b:377). It is not clear whether these figures represent the populations of only the central towns or of whole polities (i.e., *cabecera* plus rural *estancias*); however, when the figures are compared to independent sources, the former seems more likely for all towns but Tepoztlan, where the large population must pertain to the entire city-state. Thus for Tepoztlan only, the 1519 figure is divided by three following the procedure outlined under calculation G above.

* The Tlalnahua states may have been part of the Yacapitztlan conquest-state, and, similarly, the Zacualpan states may have been part of the Ocuituco conquest-state, but these relationships remain unclear (see Gerhard 1970a for discussion). These states are represented as separate entities in the above population figures.

ENVIRONMENT AND AGRICULTURE

The dense populations of Late Postclassic Morelos were supported by intensive agricultural methods that took advantage of the nature of the rivers and slopes in the area. Morelos is surrounded on all sides by mountains and comprises a natural physiographic unit. It is separated from the Basin of Mexico to the north by the Sierra de Ajusco. Moving south, elevation drops off quickly at first, then more gradually, with most of the state less than 1,500 m above sea level. Climate below this elevation is subtropical, with annual rainfall averaging between 800 and 1,100 mm and mean temperatures between 20° to 24° C; winter frosts are virtually unknown below the northern slopes. Because of its warm climate, Morelos is referred to in native historical accounts from the Basin of Mexico as the "tierra caliente" [hot land] (Durán [1967], Torquemada [1969], and others use this term for the specific region of Morelos, not as a label for a general climatic zone as is common today).

In spite of the area's favorable climate, the extent of agriculture in Morelos is limited by topography and soils. Much of the state is mountainous, and apart from rich alluvial deposits along some of the major rivers (see below), soils are generally quite thin and poor for agriculture. Only 27 percent of the surface area of the state (1,355 out of 4,941 km^2) supports rainfall agriculture *(temporal)* today (SARH 1977), and much of this represents recent clearing of poor mountainside milpas in response to demographic increase and other modern socioeconomic changes (Bolio 1976). Maize, often intercropped with beans, is by far the most common temporal crop, covering about 60 percent of the nonirrigated farmland (other major crops grown with temporal cultivation today are sorghum, peanuts, tomatoes, and onions—see Bolio [1976:67]).

Irrigation

Far more significant than rainfall agriculture is irrigation in both prehispanic and modern Morelos. A number of Morelos rivers, particularly the Chalma, Apatlaco (or Cuernavaca), Yautepec and Cuautla Rivers, are associated with significant areas of rich alluvium that are relatively easy to irrigate with simple technology. Early Spanish observers were struck by the high agricultural productivity of Morelos which suggests irrigation was important in the Late Postclassic period as well. The Códice Ramírez, for example, states that the area, "es muy fertil y abundante de todo lo necessario" [is very fertile and abundant in everything neccessary] (1944:22; see also Durán 1967:v.2:23, 393; Torquemada 1969:v.1:287). It is no coincidence that the areas of greatest population concentration in Late Postclassic and modern times are the valleys of the Cuernavaca and Cuautla Rivers, which support the largest areas of irrigated farmland in the state. Furthermore, the most powerful conquest-states in Late

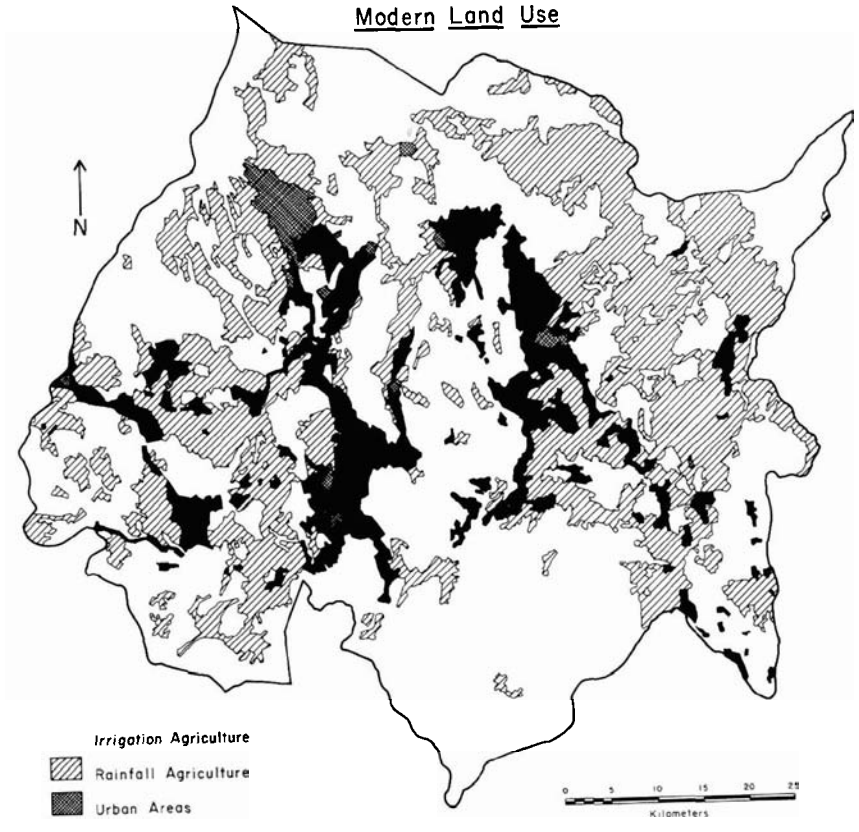

Fig. 12.2. Modern land use in Morelos. Map based upon SARH (1977).

Postclassic Morelos (Quauhnahuac, Yauhtepec, Huaxtepec and Yacapitztlan) all had general north-south orientations along major irrigated river valleys such that none were dependent upon other states for their water supply (see figure 12.1).

The extent of modern irrigation, which covers approximately 503 km^2 or 10.2 percent of the state (SARH 1977), is shown in figure 12.2. Based upon the assumption that nearly all areas under irrigation at the time of the Spanish conquest continued to be used for irrigation agriculture during the Colonial and modern periods (see below), figure 12.2 provides a maximum limit for the extent of prehispanic irrigation in Morelos. Since the mid-sixteenth century, the most important irrigated crop has been sugar cane, which occupies approximately half of the irrigated fields today (Bolio 1976:67). Other important, modern irrigated crops include cotton, rice, and beans (the extent of irrigated maize production is not reported in this source).

Table 12.3 Irrigation and cotton cultivation in Early Colonial Morelos

Polity	No.	Irrig.	Cotton	Year	Source
Quauhnahuac Conquest-State					
Quauhnahuac	1	A		1533	Declaración de los tributos (1970:145)
Quauhnahuac	1	A		1584-86	Ponce (1873:v.1:197)
Atlpoyecan	6	C		1743	Villaseñor y Sánchez (1952:169)
Tlaltenanco	11	A		1520s	document in Dubernard (1975:28)
Molotlan	15	A	--	1530s	Carrasco (1972:229ff; 1976b:46)
Tetelpan	15		X	1743	Villaseñor y Sánchez (1952:171)
Panchimalco	17	--	X	1743	Villaseñor y Sánchez (1952:171)
Xiuhtepec	24	A	--	1584-86	Ponce (1873:v.1:199)
Xoxotlan	26	--	X	1743	Villaseñor y Sánchez (1952:171)
Huaxtepec Conquest-State					
Huaxtepec	28	A	--	1580	Acuña (1984-1987:v.6:207)
Amiltzinco	28	B	--	1580	Acuña (1984-1987:v.6:35)
Ixcatepec	28	--	X	1580	Acuña (1984-1987:v.6:34)
Yzamatitlan	34	A	--	1584-86	Ponce (1873:v.1:201); see Palerm (1972:46) for location
Yauhtepec Conquest-State					
Yauhtepec	38	--	X	1580	Acuña (1984-1987:v.6:195)
Huitzillan	41	B	--	1592	Códices indígenas (1933: no. 30)
Ticoman	42	--	X	1743	Villaseñor y Sánchez (1952:174)
Yacapitztlan Conquest-State					
Yacapitztlan	43	A	X	1561	Visita (1946:219-247)
Suchitlan	43	A	X	1561	Visita (1946:219-247)
Amayucan	44	A	X	1561	Visita (1946:219-247)
Atotonilco	45	A	X	1561	Visita (1946:219-247)
Tecpantzinco	47	A	X	1561	Visita (1946:219-247)
Tetellan	48	A	X	1561	Visita (1946:219-247)
Xantetelco	50	A	X	1561	Visita (1946:219-247)
Xonacatepec	52	A	X	1561	Visita (1946:219-247)
Amacuitlapilco	52	A	X	1561	Visita (1946:219-247)
Chalcatzinco	52	A	X	1561	Visita (1946:219-247)
Tepoztlan					
Tepoztlan	53	--	X	1551	Proceso de Tepoztlan y Yautepec:7
Ocuituco Conquest-State					
Ocuituco	59	A	--	ca. 1548	Suma de visitas (1905:183)
Quauhzolco	65	C	X	ca. 1548	Suma de visitas (1905:66)
Temoac	66	A	--	ca. 1548	Suma de visitas (1905:184)
Tlacotepec	67	A	--	ca. 1548	Suma de visitas (1905:195)
Zacualpan	68	A	--	ca. 1548	Suma de visitas (1905:65)

Note: Source refers to the use of irrigation as follows: (A) for subsistence crops and/or cotton; (B) for crops, type not specified. (C) source states that irrigation is *not* present. (X) source specifically mentions cotton cultivation.

Early Colonial sources reported an abundance of irrigated land in Morelos. For example, Ponce wrote in 1584/86 that, "hay abundancia de agua para regarle todo" [there is an abundance of water to irrigate everything] (1873:v.1:198), and the ability of irrigated land to produce two crops per year was described in 1533: "se cogía dos veces fruto en un año, a causa que [las tierras] eran de regadío" [two crops of fruit were harvested yearly, because [the fields] were irrigated] (*Declaración de los tributos* 1870:145; see also *Visita, tasación y cuenta* 1946:219ff). Information on Colonial irrigation in Morelos must be treated carefully in the reconstruction of prehispanic practices because of the early introduction of irrigated cane cultivation during the sixteenth century. The soils and hydrology of the alluvial zones of Morelos are ideal for cane cultivation, and Cortés and other early encomenderos lost no time in planting the crop in irrigated zones throughout the state (Riley 1973:64-66). The replacement of irrigated maize, cotton, and other indigenous crops by cane during the sixteenth century proceeded so quickly that by 1600, Morelos had ceased to be self-sufficient in maize and had to import the grain from surrounding regions (Moreno Toscano 1965). Because cane must be irrigated, the simple mention of irrigation in Colonial documents may refer to newly-constructed canals for cane and not to irrigation systems in existence during prehispanic times.

Published data on sixteenth-century irrigation in Morelos are assembled in table 12.3 (see also Maldonado [1990:135-188] on conquest-period irrigation). This list, which indicates the presence of irrigation in 17 of the Morelos city-states, augments considerably the number of references to prehispanic irrigation published by Palerm (1972:46). In table 12.3, category A includes only those references to irrigation where subsistence crops or cotton are specifically mentioned; some of these citations note that both cane and subsistence plots were irrigated. Category B consists of two citations that mention irrigation without specifying the nature of the crops, and "no" indicates two citations that specifically declare an area as not irrigated. It should be noted that the references in category A range from statements of extensive irrigated land in an area (e.g., "todo es de regadío" [everything is irrigated] in Temoac, and "se riegan muchas y grandes sementeras de maíz" [many large fields of maize are irrigated] in Huaxtepec) to simple declarations that irrigation was practiced (e.g. "es tierra de regadío" [this is irrigated land] in Tlacotepec).

In figure 12.3, the data of table 12.3 are plotted by city-state (see table 12.1 for a key to the names of city-states). The whole area of a city-state is hatched if irrigation is mentioned as occurring anywhere within the polity; the map thus does not illustrate the actual extent of irrigation within polities (refer to figure 12.2 for a closer approximation of the maximum extent of irrigation). The lack of evidence for irrigation along the Chalma and Amacusac Rivers in western Morelos is almost certainly a function of the general lack of Early Colonial documentation for this area (Nicholson 1971; Riley 1973); the floodplains of

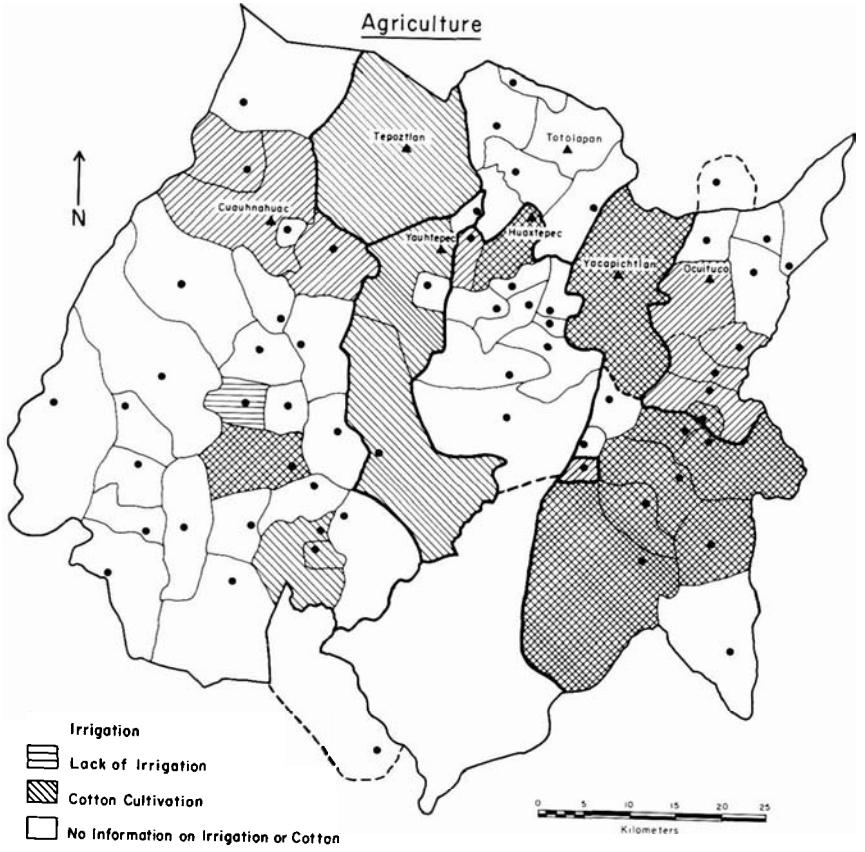

Fig. 12.3. Irrigation and cotton cultivation in Late Postclassic Morelos. See table 12.3 for the key and citations.

these rivers are irrigated today (SARH 1977) and were probably irrigated in prehispanic times as well. The presence of prehispanic irrigation probably can be inferred for areas with cotton cultivation in the sixteenth century because of the documented use of irrigation to grow that crop (see below); this inference increases the number of city-states with irrigation from 17 to 22 or 23 (table 12.3; figure 12.3).

Cotton

Cotton was the most important nonsubsistence crop grown in Morelos at the time of the Spanish conquest. Cotton textiles in the form of mantas were

common media of exchange in Late Postclassic Central Mexico. They were among the most numerous items of tribute at all levels (see below) and were traded extensively in marketplaces (Berdan 1987; Hicks, chap. 4). Cotton does not grow in the Basin of Mexico, and woven textiles were imported by the hundreds of thousands each year through imperial tribute (*Codex Mendoza* 1992) and various trade mechanisms. The low weight of cotton textiles made them a significant means for the long-distance transfer of economic value in an economy based upon human transport (Berdan 1987; Drennan 1984). Morelos was the closest cotton-producing area to the Basin of Mexico, and its textiles played an important role in the inter-regional exchange networks of the Central Mexican highlands.

Early Colonial descriptions of Morelos usually comment on the quantity and quality of Morelos cotton. For example, Durán writes that Morelos was "riquisima de algodón, donde acude el trato de toda la tierra en el" [very rich in cotton, and traded it with the whole land] (1967:v.2:23; see also Torquemada 1969:v.1:104). Morelos polities annually provided tribute of 32,000 cotton mantas and garments to the Triple Alliance (see below), and these goods are also common in sixteenth-century local encomienda tribute lists. Archaeological studies have documented widespread cotton-spinning activities at Late Postclassic sites in the state (Smith and Heath-Smith, chap. 13; Smith and Hirth 1988). In table 12.3 I list references to cotton cultivation in Early Colonial Morelos; mere mentions of cotton tribute are not included since tribute goods often were not produced locally.

References from the relatively late date of 1743 are appropriate for inferring prehispanic cotton cultivation because of the great decline in the Morelos cotton industry in the sixteenth and seventeenth centuries (it is unlikely that cotton cultivation spread to new areas between 1519 and 1743). Riley (1973:45-47, 70ff) documents a situation where local tribute payments progressively changed from cotton mantas to money as populations declined and intensive agricultural systems were converted to cane or abandoned. The cotton industry in Morelos did not expand again until the mid-twentieth century (Bataillon 1972:207), but by 1974, cotton had become the fifth most profitable cultigen in Morelos, covering at least 5,000 hectares (Bolio 1976:30). Some indication of continuity in the Morelos cotton industry from prehispanic to Colonial times comes from a Colonial period archaeological site, RCT-79. This site has no apparent prehispanic remains, but the cotton-spinning artifacts from the site are identical to prehispanic examples from other parts of the state (Kenneth G. Hirth, unpublished data).

Of the 17 towns cited as growing cotton in Early Colonial times, nine are listed as having irrigated cotton fields, one is said specifically not to have irrigation, and nothing is said of irrigation for the remaining seven. In his study of Late Postclassic irrigation in the Balsas River drainage (which includes Morelos),

Armillas (1949:112) found that the number of towns listing cotton as an irrigated crop was second only to the number of towns listing maize. Thus, it appears that cotton was almost always irrigated in Morelos and the general Balsas area, as it is today. There is little published information on specific techniques of cotton cultivation in Morelos, but one source states that cotton and maize were often grown together in the same field (*Visita, tasación y cuenta* 1946:180, 220ff). As in the case of the documentation of irrigation practices, cotton cultivation was almost certainly more extensive in Late Postclassic Morelos than the published sources indicate.

Other Crops

In addition to cotton, maize, beans, chia and amaranth, all of which were provided to the Triple Alliance in tribute (*Codex Mendoza* 1992:f.23r-25r), other indigenous agricultural crops cultivated in Early Colonial Morelos included tomato, chile, jicama and camote (*Visita, tasación y cuenta* 1946:219-231), several kinds of fruit (Ponce 1873:v.1:198), and maguey. The "pulque maguey" variety, used economically for sap and fibers, only grew in the northern part of the state where elevations were highest (Acuña 1984-87:v.6:192, 207-208, 218; v.7:267; v.8:163). The two Triple Alliance tributary provinces of Morelos, Quauhnahuac and Huaxtepec, are the only areas listed as suppliers of paper to the empire. Paper was among the gifts brought by Morelos nobles to Mexica state ceremonies (Durán 1967:v.2:297), and several documents emphasize the importance of amate bark paper production in Tepoztlan (Acuña 1984-1987:v.6:192; Proceso de Tepoztlan y Yauhtepec 1551:8) and the Ocuituco region (Gerhard 1970b:110ff). Ground stone bark-beaters, indicative of prehispanic paper production, are commonly found at Late Postclassic archaeological sites (Mason 1980:165; Smith and Heath-Smith, chap. 13). Morelos also provided flowers for use in state ceremonies in the Basin of Mexico (Torquemada 1969:v.2:477; see also Carrasco 1968:372).

Cacao is commonly found in Early Colonial encomienda tribute documents from Morelos (e.g. Carrasco 1964a:187, 1968:374, 1972:229ff; Riley 1973:37f). Although several sources explicitly state that cacao was not grown locally and had to be obtained through exchange (Acuña 1984-1987:v.6:222; *Declaración de los tributos* 1870:145), it is possible that some cacao was grown in the high rainfall zones of the northern part of the state. According to the Relación de Huaxtepec (Acuña 1984-1987:v.6:201), both cacao and rubber plants were transplanted from Veracruz to Motecuhzoma's Huaxtepec botanical garden (see also Armillas 1949:100f). The growing requirements of cacao are similar to those for coffee (Palerm 1967:40), which is cultivated in small amounts in Tepoztlan and Cuernavaca today. Furthermore, there was a sixteenth-century settlement named Cacahuamilpan (literally "cacao field") in the prehispanic state of Tlachco (ancient Taxco) along the Morelos border where cacao was reportedly grown in the sixteenth century (Acuña 1984-1987:v.7:123). However, the use of cacao was so extensive in Late Postclassic Morelos (e.g., the *Relación de Tepoztlan* noted an active trade in cacao through local markets; see Acuña 1984-1987:v.6:195) that the bulk of it must have been obtained through trade, probably with the Pacific coastal areas of modern-day Guerrero or Oaxaca (see Bergmann 1969).

Discussion

The dense population of Late Postclassic Morelos was supported by intensive agricultural methods. In addition to the ethnohistorically documented irrigation systems discussed above, archaeological fieldwork has revealed extensive areas of agricultural terracing throughout the state. Price and Smith (1992) and Smith and Heath-Smith (chap. 13) describe two types of stone terraces—contour terraces on hillsides and cross-channel terraces in ravines—that have been excavated at the sites of Cuexcomate and Capilco in western Morelos. It appears that all available land was probably under cultivation at the time of the Spanish conquest. Alluvial lowlands were irrigated and upland areas were terraced. Only the widespread use of intensive agricultural techniques could have produced the situation noted in the Códice Ramírez (1944:22) of a land: "muy fertil, abundante de todo lo necessario" (see above). This description would not accurately describe Morelos farming without the use of irrigation and terracing. Further discussion of Late Postclassic agriculture in Morelos may be found in Maldonado (1990), who reviews the relevant published and archival sources.

TRIBUTE

A primary mechanism for moving cotton and other agricultural products from producers to consumers was the tribute system. Tribute payments were of fundamental importance to the sociopolitical order of Postclassic Central Mexico. The nobility were distinguished from and supported by commoners on the basis of tribute, and tribute was the goal of military expansion by city-states, conquest-states, and empires. In Morelos there were four levels of tribute payments which may be mapped onto three levels of political organization. The two lowest levels of tribute comprised payments in goods and services that may be termed a form of tax ("a payment levied on individuals," [Mair 1977:98]). These levels (nos. 3 and 4 below) concerned relations between commoners and nobles and relations among nobles, and the payments took place within the context of

Table 12.4 Cotton textile tribute from Quauhnahuac and Huaxtepec

Category	Level	Quauh-nahuac	Huaxtepec			
			Tepoztlan	Yauhtepec	Huaxtepec	Yacapitztlan
A. Total population	--	245,200	41,200	73,200	83,400	114,200
B. Total commoner households	--	45,410	7,630	13,560	15,440	21,150
C. No. of subject city-states	--	27	--	5	10	10
MODEL 1						
Conquest-State Tribute						
D. Tribute to Aztec empire	1	16,000	3,200	3,200	3,200	3,200
E. Tribute taken in	2	25,353	7,850	7,850	10,502	4,986
F. Tribute rate	--	.631	.408	.408	.305	.642
City-State Tribute						
G. Average tribute paid out	2	939	--	1,470	1,050	499
H. Tribute rate (assumed)	--	.40	--	.40	.40	.40
I. Average tribute taken in	3	2,348	--	3,925	2,625	1,248
J. Total tribute taken in	3	63,383	--	19,625	26,255	12,465
MODEL 2						
Conquest-State Tribute						
D. Tribute to Aztec empire	1	16,000	3,200	3,200	3,200	3,200
E. Tribute taken in	2	41,353	11,050	11,050	13,702	8,186
F. Tribute rate	--	.387	.290	.290	.234	.391
City-State Tribute						
G. Average tribute paid out	2	1,532	--	2,210	1,370	819
H. Tribute rate (assumed)	--	.40	--	.40	.40	.40
I. Average tribute taken in	3	3,830	--	5,525	3,425	2,048
J. Total tribute taken in	3	103,383	--	27,625	34,255	20,465

Note: Tribute figures are expressed in numbers of mantas paid per year. The sources and calculations used are described below:

A. Total population of each conquest-state, calculated as the mean of estimates D and E in table 12.2. The Yacapitztlan conquest-state is assumed to include the Tlalnahua states of southeastern Morelos; this is reflected in the population figure, the number of city-states, and the encomienda tribute used to estimate category E.

B. A rough estimate that permits an assessment of the tribute burden on the household level. B is calculated by dividing the commoner population by 5.4, the mean household size in Tepoztlan (see notes to table 12.2).

C. The number of city-states subject to each conquest-state (see table 12.1; methods are described in Smith [1983]).

D. The number of cotton mantas paid to the Aztec empire by the provinces of Quauhnahuac and Huaxtepec (16,000 each) as reported in the *Codex Mendoza* (1992:23r-25r). These figures follow from Berdan's (1976:138) analysis of tribute levels in this source. Briefly, each manta glyph with a "400" glyph is assumed to represent 400 mantas, not 400 loads of mantas as suggested by Barlow (1949) and Drennan (1984). The imperial tribute of Huaxtepec province has been apportioned evenly among the five constituent states—Tepoztlan, Yauhtepec, Huaxtepec, Yacapitztlan, and Totolapan. Totolapan is not included in the table because of a lack of comparable data for encomienda tribute levels (category E).

city-states. The upper two levels of payment constituted tribute properly speaking ("a lump sum demanded from a subject area," [Mair 1977:98]). Level 1 tribute defined relationships between local polities (both city-states and conquest-states) and the Triple Alliance empire, and Level 2 defined relationships between city-states and their dominant conquest-state. The term *tequitl* was used to designate all four levels. A major uncertainty is the extent to which these levels were integrated into a single coherent system.

Level 1

The highest level of tribute, that paid to the Triple Alliance, is the best documented portion of the entire tribute hierarchy. In Morelos, this level was initiated within a year or two of Itzcoatl's conquest of Quauhnahuac in 1438 (Smith 1987). In 1519, the Quauhnahuac and Huaxtepec tributary provinces each supplied the Mexica with cotton textiles, warriors' costumes and shields, paper, grain (maize, beans, chia, huautli), and gourd bowls (*Codex Mendoza* 1992:f.23r-25r). The absolute quantities of goods paid to the Triple Alliance have been the subject of some dispute because of ambiguities in the sources and discrepancies among the major tribute lists (*Codex Mendoza* 1992; *Matrícula de Tributos* 1980; Scholes and Adams 1957). Berdan (1976) discusses these problems, and on the basis of her conclusions, the textile tribute of the Quauhnahuac and Huaxtepec provinces as stated in the *Codex Mendoza* may be put at 16,000 cotton items (mostly mantas) per province per year. These figures form the starting point of a quantitative reconstruction of cotton textile tribute in Morelos at the city-state and conquest-state levels. The numerical estimates are presented in table 12.4, and the necessary citations and explanations are discussed in the notes to the table. For the sake of simplification, all items of

E. Projection of conquest-state tribute income in 1519. Calculations start with textile tribute levels from a *tasación* of 1534 (Riley 1973:45); these are standardized for the population at that time (1534 population estimates are interpolated using the Model 1 post-conquest population decline rate discussed in the text). The resulting rate of mantas per person per year is then applied to the estimated populations for 1519 from table 12.2. The unadjusted 1534 manta tribute levels for the five polities (in the order they are listed in the table above) are as follows: 9,120; 5,920; 5,920; 7,920; and 3,760. The estimates for 1519 tribute are listed as category E for Model 1, while these figures plus the category D imperial tribute constitute the category E estimates in Model 2.

F. The proportion of conquest-state tribute income that was paid out to the Aztec empire (D ÷ E).

G. Estimate of the average amount of textile tribute paid by subject polities to to their conquerors. Calculated by dividing the tribute income of the conquest-states by the number of constituent city-states. Tepoztlan had no subject city-states (E ÷ C).

H. A tribute rate of 40% is assumed in order to estimate tribute income at the city-state level.

I. Estimate of the textile tribute income of the average city-state, calculated according to the assumed 40% tribute rate (G ÷ H).

J. The total textile tribute income for all of the city-states in a conquest-state, calculated using the 40% tribute rate (E ÷ H).

cotton cloth are counted as one manta in table 12.4. While this obscures differences in value among the types of items (e.g., mantas, naguales, huipiles) and among the types of mantas, it is unlikely that such distinctions would greatly modify the patterns evident in the table.

There is little explicit information in the ethnohistoric sources on the precise mechanisms by which imperial tribute was produced, collected, transported and generally administered. Imperial tribute collectors *(calpixque)* were sent to the provinces to oversee collection and shipment (Berdan 1982:38), but from their small numbers and the lack of additional imperial infractructure in provincial areas, I would infer that most of the activities of production, collection, and administration prior to final shipment were under local control (Rojas, chap. 15). I have argued elsewhere (Smith 1986) that one reason for the rapid expansion of the Triple Alliance empire was the ability of the imperial states to tap into pre-existing local tribute systems. Provincial polities could be relied upon to produce and collect their share of imperial tribute, circumventing the need to establish an entirely new, elaborate imperial bureaucracy in the provinces. A number of documentary sources substantiate this view, and suggest that Level 1 tribute was merely added to existing tribute networks, while the lower three levels continued to function as they had prior to incorporation into the empire (e.g., Zorita 1963:121; see discussion in Gibson [1971]).

Level 2

The second level of tribute consisted of payments made by dependent city-states to the conquest-state capitals. This tribute was presumably assessed by city-state rather than by household or *calpulli* so that the conquest-state did not have to involve itself in local tribute administration and collection (Zorita 1963:118). Two types of Early Colonial documents dating before 1550 provide data on this level of tribute in Morelos: lists of the total tribute receipts of the encomiendas, and lists of the encomienda payments of individual subject towns.

Encomienda tribute lists. Lists of tribute paid to encomenderos provide information on the total tribute received as income by the conquest-states, and thus give a picture of the upper end of Level 2 tribute (in Morelos encomiendas were assigned on the basis of native conquest-states, in contrast to the Basin of Mexico where they were assigned following city-state territories; see Smith 1983:121-122). Between 1522 and 1530, the peoples of Morelos provided varied and extensive goods and services to Hernán Cortés and the other encomenderos. Among goods found in these lists are cotton textiles, foodstuffs, cacao, firewood, fodder, building materials, gold jewelry, and tropical feathers, plus slaves and general labor service (Riley 1973:35-40, 143).

A list of tribute to the Cuernavaca encomienda in 1533 contains goods and services similar to those in the 1522-1530 period, but also includes labor in the encomendero's maize and cotton fields, laborers and food provisions for nearby mines in Guerrero, and tribute in pottery; the source also states that such Level 2 tribute was recorded in pictorial documents (*Declaración de los tributos* 1870), although none of these have survived for Morelos. In 1534, Morelos encomienda tribute was adjusted and standardized by royal decree in a series of *tasaciones;* after this time only cotton textiles and foodstuffs (primarily turkeys and tortillas) were included, and by 1550 most tribute was paid in money.

The 1534 *tasaciones* (Riley 1973:45) provide the opportunity to quantify cotton textile tribute at this level. Based on the fact that Morelos encomiendas were established in terms of conquest-states, and given the general continuity in tribute from 1519 to 1534 (Riley 1973:35-48), the quantities of textiles collected by the encomienda in 1534 may be projected back to 1519. As explained in the notes to table 12.4, I first standardized the tribute levels from 1534 for population size, then apply the resulting rate (mantas per person) to the 1519 populations of the conquest-states. The resulting tribute estimates for 1519 are included as category E in table 12.4. Two alternative reconstructions (Models 1 and 2) are presented in the table. Model 1 assumes that Spanish encomienda tribute levels included the imperial tribute collected by conquest-states and delivered to the Triple Alliance before 1519. Model 2 assumes that the encomienda tribute was a continuation of only the local portion of the pre-1519 conquest-state tribute. In this model, the imperial tribute has to be added to the estimated conquest-state income (category E) in order to establish the total amount of textiles collected by the conquest-states.

Tribute rates, defined as the proportion of tribute income paid out to higher-level polities, are calculated for both models in table 12.4 (category F). Such rates should be inversely correlated with the politico-economic power of the polity relative to its superior state (i.e., a weak subject state under strong control by a powerful state would control fewer independent resources and thus keep less tribute for itself than a strong state only loosely controlled by an external polity). Given the relative strength and power of the Quauhnahuac conquest-state and the looseness of imperial control in the provinces (see Smith 1986), a lower tribute rate is more appropriate (at least for this polity), and thus Model 2 with its lower rates provides a better fit to the available data. There is little comparative information on tribute rates, although a .50 level is reported by Roscoe (1911:245) for the Baganda of Africa (see Steponaitis [1984:147] for discussion).

Tribute paid to encomenderos by individual towns. The second type of documentation for Level 2 tribute consists of lists of tribute paid to encomenderos

by individual subject towns. I assume that Early Colonial tribute by towns to encomiendas represents a continuation of prehispanic tribute by city-states to conquest-states. Examples of this Colonial tribute are listed for the towns Tetela, which in 1549 paid mantas, honey, turkeys, tortillas, maguey and fodder (*Libro de las tasaciones* 1952:436), and Zacualpa, which in 1548 paid mantas, honey, aji and salt (*Suma de visitas* 1905:65). The sources clearly indicate that considerable tribute at this level consisted of goods not native to Morelos (salt, cacao, gold jewelry, tropical feathers); these were almost certainly obtained by exchange through markets or specialized long-distance merchants.

Estimates of textile tribute amounts at this level are provided in category G of table 12.4. These figures result from dividing the tribute income of each conquest-state by its number of constituent city-states. The plausibility of these figures is shown by the actual textile tribute amounts paid by certain towns to their encomenderos in the sixteenth century. These amounts, adjusted for 1519 population levels as described in the notes to table 12.4, are 1,520 mantas annually from Tetela (based upon 1549 tribute [*Libro de las tasaciones* 1952:437]), and 589 from Zacualpan, 503 from Huazulco and 1,192 from Temoac (all based upon 1548 tribute [*Suma de visitas* 1905:65, 66, 195]). These city-states are not included in the *Codex Mendoza* tributary provinces, and therefore are not represented in table 12.4, but they do suggest that the estimates for average city-state textile tribute in Morelos are not unreasonable.

Table 12.4 also provides estimates for the average tribute income of the city-states as well as the total income per conquest-state at this level. These estimates are based upon an arbitrary .40 tribute rate since following the logic presented above, the rate at the city-state level should be somewhat higher than the rate at the conquest-state level. The amount of textile tribute taken in by city-states is relatively modest when calculated by household (category B in table 12.4); on average, each commoner household in Morelos would have paid only about 3 mantas total per year to support city-states, conquest-states, and the Triple Alliance. Actual household tribute production was much higher than this, however, because local tribute (levels 3 and 4) must be considered.

Level 3

At the third level of tribute, nobles supported their local *tlatoani*, thereby supporting the local city-state government. Although documentation for this level is scanty, the Nahuatl census documents do provide at least one example. The noble Molotecatl tecuhtli, head of the *calpulli* of Molotlan, paid an annual tribute of 20 "Cuernavaca mantas" *(cuauhnauacayotl)*, 40 "tribute mantas" *(tequicuachtli)*, 8 worked garments, 26 "toallas," 1800 cacao beans, 13 turkeys, several other food items, plus various service obligations, the latter presumably carried out by his dependent commoners (Carrasco 1972). This tribute probably

represents a continuation of prehispanic payments to the local *tlatoani*. Molotecatl and his family did not have to produce the tribute goods or perform the service labor directly, but he did have responsibility for gathering, delivering, and organizing his share of city-state tribute. It is instructive that in the census documents, commoners dependent upon local nobles are referred to as both *ytech poui*, "those who pertain to him," and *tequinanamique*, "those who help pay tribute" (Carrasco 1972).

Level 4

At the lowest level of tribute, commoners supported their local nobles with goods and services. The goods included foodstuffs, raw cotton, and cotton mantas; the services included agricultural labor, household service (particularly corn grinding), and labor for the manufacture of textiles. Some of this tribute went to support the noble household, but much of it was destined to be passed along to the local *tlatoani* as Level 3 tribute (Carrasco 1968, 1972, 1976a, 1976b; Cortés 1865). In many cases, the commoners were provided with land by the local noble, and their tribute could be viewed as an exchange for use of the land. For example, Molotecatl tecuhtli distributed 228 *brazas* of his own 600 *brazas* of land to 10 dependent households, who provided him annually with a total of seven mantas plus food and labor services (Carrasco 1972:243). Carrasco's studies make it clear that tribute levels of individual households were fixed on the basis of land allotments (1964b:376, 1968:373ff, 1972:242, 1976a), a pattern also found in the Basin of Mexico (Gibson 1964:198, 518).

A comparison of the seven mantas received annually by Molotecatl with the 94 cotton items that he had to pay out in Level 3 tribute (see above) points to a discrepancy of 87 items per year. A major portion of these items probably were manufactured for Molotecatl by dependent commoner women. It was a routine practice for commoner women from households dependent upon local nobles to come to the nobles' houses for two major kinds of labor service: kitchen labor (primarily grinding maize and making tortillas) and spinning and weaving textiles (Carrasco 1968:374, 1972:233, 1976a:107; Cortés 1865:542). In the case of Molotecatl's immediate dependents, four of the commoner households contributed textile labor (Carrasco 1972:243). If this were the only source of additional cotton items, then each of the four households would have contributed the labor to make approximately 22 mantas annually (in addition to their other tribute obligations). This figure probably should be increased significantly because nobles like Molotecatl must have required mantas beyond their tribute quotas in order to exchange for luxury items and other goods in the markets. It is therefore likely that Molotecatl had additional textile income (either in finished pieces or in labor) beyond that provided by the commoners listed as his immediate dependents (see Hinz et al. [1983] for the text of the Molotla census).

In summary, the four levels of tribute in Late Postclassic Morelos constituted a single integrated hierarchical system. At least some of the goods paid at the lowest level (Level 4) worked their way up the hierarchy to end up at Tenochtitlan in the Basin of Mexico. The most problematic aspect of the above reconstruction is Level 3 because there is little information from Morelos or elsewhere on the precise obligations of nobles to their local *tlatoani* and city-state government. Apart from the food supplied to nobles from their dependent commoners, cotton textiles were by far the most numerous and important item of tribute at all levels in Morelos. As the reconstruction shown in table 12.4 demonstrates, the total quantity of textiles moving through the tribute system was quite large. Although documentation is not extensive, textiles and other goods probably moved back and forth between the tribute system and the market system at all levels (see Berdan 1987). The comparison of population figures with textile tribute requirements suggests that state-level cotton tribute (Levels 1 and 2) did not represent a very heavy burden on most commoners (table 12.4), but the actual effects of tribute on the household level cannot be ascertained until we have information on two key issues. First, we need to know more about the intensity of tribute quotas at Levels 3 and 4, particularly the service or labor requirements. Second, we need to know just how much labor was needed to manufacture mantas and other cotton items. As pointed out by Berdan (1987), the latter issue is more complex than it might seem, although some suggestions are presented by Hicks (chap. 4).

TRADE AND MARKETS

Marketplaces are noted in early documentary sources at five conquest-state capitals and four city-state capitals as well as at several smaller settlements (table 12.5). As is the case for irrigation and cotton cultivation, the available documentary evidence almost certainly underestimates the number of prehispanic markets in Morelos, especially in the Quauhnahuac state. The *Relaciones Geográficas* indicate a lively trade in a number of Morelos marketplaces and mention the following as goods traded locally in the Morelos markets: cotton, paper, cacao, fruit, honey, and lime plaster (Acuña 1984-1987:v.6:195, 211, 222; v.7:270; v.8:164). Other sources discuss the sale in the markets of salt and various food items (*Visita, tasación y cuenta* 1946:236), and possibly slaves (Carrasco 1968:375). The nonlocal products in Level 2 tribute lists (e.g., tropical feathers and gold jewelry [see above]) were probably traded in the Morelos markets as well. There are several additional lines of documentary evidence for long-distance trade connections reaching outside of Morelos

Table 12.5 Marketplaces in Early Colonial Morelos

Town	City-State	Date	Source
Conquest-State Capital Cities			
Quauhnahuac	1	16th Cent.	Durán (1967:v.1:23)
Huaxtepec	28	1561	Visita (1946:244)
		1580	Acuña (1984-1987:v.6:202)
Yacapitztlan	43	1561	Visita (1946:220-240)
Tepoztlan	53	1580	Acuña (1984-1987:v.6:195)
Totolapan	54	1580	Acuña (1984-1987:v.8:164)
City-State Capitals			
Xantetelco	50	1561	Visita (1946:220ff)
Tlayacapan	58	1743	Relación de Tlayacapan (1980:60)
Hueyapan	61	1580	Acuña (1984-1987:v.7:270)
Tetellan	63	1580	Acuña 1984-1987:v.7:270)
Subject Towns (estancias or barrios)			
Ocotepec	1	1552	Títulos de Cuernavaca (1947:218)
Tianguistenco	1	1552	Títulos de Cuernavaca (1947:219)
Suchitlan	43	1561	Visita (1946:245)
unnamed	43	1561	Visita (1946:230)

Note: The numbers under the category "City-State" indicate the states to which the market towns belong (see table 12.1 and fig. 12.1).

proper. For example, the Tlahuica of Morelos were one of a number of Central Mexican ethnic groups (including the Mexica) who used a common trade route to the Tehuantepec area during the time of Ahuitzotl (Durán 1967:v.2:357), and a document cited by Carrasco (1968:374) mentions *pochteca* trading in Morelos (see also O'Mack 1985).

These data on markets and merchants paint a picture of significant commercial activity throughout Morelos. The presence of markets at even very small settlements (table 12.5) suggests that all sectors of society, from the urban elite to rural commoners, were served by the market system. This interpretation is borne out by archaeological evidence for external trade contacts during the Late Postclassic period. There is evidence for the importation of obsidian, salt and ceramics from the Basin of Mexico; obsidian and bronze artifacts from western Mexico; and ceramics from several other areas of the Central Highlands (Smith 1987, 1990, 1994; Smith et al. 1984; Smith and Heath-Smith, chap. 13). Cotton was an item traded from Morelos throughout the Central Mexican area. Durán (1967:v.2:23) states that "toda la tierra" traded with Morelos to obtain cotton. Raw cotton was bought in Morelos by people from the Basin of Mexico to be spun and woven at their homes (Acuña 1984-1987:v.7:244), and we know that

merchants from Yacapitztlan sold Morelos cotton in Basin of Mexico markets (*Visita, tasación y cuenta* 1946:222). Quauhnahuac mantas were regarded as the finest available in Central Mexico (Ramírez de Fuenleal 1870b:256) and must have been widely traded since they are listed as local tribute items in other parts of the Central Highlands (e.g., *Libro de las tasaciones* 1952:557).

Most of this external exchange was carried out through channels independent of Triple Alliance control. Spence (1985) and Isaac (1986) have argued that only a small portion of the Late Postclassic obsidian industry was controlled by the Mexica state, and there is no evidence that the Mexica administered the exchange of salt or ceramics. Many of the finished cotton textiles moving from Morelos to the Basin of Mexico were part of the state-controlled tribute system, but the sources suggest that most of the trade in raw cotton was carried out independently. In Late Postclassic archaeological sites in the Basin of Mexico, the prevalence of ceramic spindle whorls for spinning cotton indicates that this trade, from Morelos and other areas, must have been quite extensive (Parsons 1972; Hicks, chap. 4). In summary, it appears that a large part of Late Postclassic inter-regional exchange in Central Mexico was not under the control of the Triple Alliance empire.

CONCLUSIONS

For the last seven or eight decades prior to the Spanish conquest, the Triple Alliance empire covered nearly all of Central Mexico. This has led many authors to think that an adequate understanding of social and economic organization within the area can be gained by focusing on the empire (e.g., Barlow 1949; Davies 1973). The data presented in this paper, however, suggest that this is not the case. Incorporation into the empire had relatively modest direct effects upon social and economic patterns in provincial areas, and much of the interaction within and between regions took place through channels independent of the Triple Alliance states. This is not to say that the existence of the Triple Alliance empire was of little consequence to provincial areas of Central Mexico. Although direct effects of imperial conquest were relatively modest, incorporation into the empire brought about a number of very significant indirect effects in the provinces. Not only were local rulers left in power by the empire, but in some cases, their rule was supported and strengthened (Smith 1986). With Triple Alliance support, provincial conquest-states could increase their own nonimperial tribute demands, and when city-state and lower-level tribute is added in, the total tribute exacted from commoner households must have had a significant impact on their domestic economies (Hicks, chap. 4).

Morelos was the first area outside of the Basin of Mexico to be conquered by the Aztec empire, partly because of its proximity and partly because of its high level of political and economic development. It is easier for an empire to administer an area of established hierarchical political organization than an area without such a condition. Economically, the dense populations of Morelos provided labor for the empire (indirectly through the cultivation of cotton and the production of textiles), and the intensive agricultural systems provided grains, cotton, and other goods for imperial tribute and trade. These attractions for the Triple Alliance resulted from socioeconomic conditions in Late Postclassic Morelos. Economic and political patterns were quite similar to those in the better-documented Basin of Mexico. This situation is only revealed when detailed studies are carried out in areas beyond the Basin of Mexico. Such studies suggest that the economies and polities of Morelos and other provincial areas are better understood as local phenomena with wide interactions than as simple victims or recipients of Aztec imperialism.

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Rural Economy in Late Postclassic Morelos

An Archaeological Study

Michael E. Smith and Cynthia Heath-Smith

What was life like in the rural communities of Central Mexico in the Late Postclassic period? How were these communities affected by their conquest and incorporation into the Aztec empire? Our recent archaeological fieldwork in the modern Mexican state of Morelos, Mexico, provides new information on the nature of peasant households and communities in a provincial area of the Aztec empire. We recovered evidence for a densely settled, socially complex rural landscape. Elites lived at both rural and urban sites; craft production and intensive agriculture were prominent activities, and marketplace exchange with near and distant areas was commonplace. In this paper we explore these and other economic issues as documented by the Postclassic Morelos Archaeological Project,an excavation-based study of socioeconomic conditions among rural[1] households at the sites of Cuexcomate and Capilco in western Morelos. After presenting information on householdeconomy, we explore the implications of these data for some of the important issues in the analysis of Aztec economics, including the role of population growth, the effects of imperial conquest, and the degree of centralized political control over economic activities.