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Intensification, Political Economy, and the Farming Community

In Defense of a Bottom-Up Perspective of the Past

Clark L. Erickson

Archaeologists scramble up tall terraces, wade through cold water in irrigation canals, hop over stone walls, and diligently search farmers' fields for significant concentrations of potsherds that can be registered as a site. In their search for sites, however, most tend to ignore the landscape and what it can show us about agricultural intensification. Contemporary archaeology is firmly rooted in the site concept. Rural sites are said to date agriculture through proximity, and the density, duration, and distribution of settlements are considered indirect evidence of the degree of agricultural intensification. However, we pay only lip service to agricultural fields and boundaries, pathways, roads, and shrines—all seem to be secondary to the goal of finding sites in the form of settlements and monuments. Agricultural features might be described and sketched on the back of site survey forms, but they are rarely discussed in final publications. Despite the term's current popularity, *landscape* still equates with environment, as it is considered merely the context of a site for most archaeologists.

If we are genuinely interested in issues of intensification and intensive agriculture, why do we ignore the most important landscape for directly addressing issues of prehistoric agriculture such as social organization, land tenure, labor organization, and rural lifeways? I would suggest that our perspective has been directed, and limited, by our own cultural background. Few of us grew up on farms or have colleagues that did. Although we are often surrounded by living farming traditions where we excavate and do settlement survey, we rarely pay attention to the farm life going on around us and ignore the relevant local historical and ethnographic literature. In this chapter I will discuss and address a number of explicit and not-so-explicit archaeological assumptions about

farming, social organization, settlement patterns, and intensification, as well as their relationship to political economy. I will then show that these assumptions remain largely unsupported by ethnographic and historical evidence. I suggest that a landscape approach that generates models through general and specific analogy and then tests them against landscape signatures of intensive agriculture, agricultural intensification, social organization of labor, land tenure, and energetics can provide a more complete understanding of the rural agrarian past than by relying on sites and settlement patterns alone. I argue that bottom-up approaches are valuable alternatives to the traditional top-down approaches currently used by archaeologists.

INTENSIVE AGRICULTURE, AGRICULTURAL INTENSIFICATION, AND POLITICAL ECONOMY

In the 1960s Ester Boserup (1965) developed her theory of agricultural change. It was a powerful general processual model that attempted to explain agricultural change throughout space and time; and archaeologists, geographers, and historians quickly adopted the Boserupian perspective (e.g., Farrington 1985; Sanders et al. 1979; Spooner 1972; and many others).[1] Over time, some scholars became increasingly disillusioned with many of the basic assumptions of the theory (e.g., population pressure as the primary cause of change, the Law of Least Effort, and the Law of Diminishing Returns). Unconvinced that population pressure could adequately explain agricultural change, scholars began to examine the roles of risk management, innovation, diffusion of technological improvements, competition, agency, market demands, historical contingency, and culture. Historical, ethnographic, and archaeological research based on detailed case studies demonstrated that the predictions of the Boserup theory were rarely confirmed by empirical examples (e.g., Bronson 1972, 1975; Brookfield 1972, 1984, 2001; Erickson 1993, 1996; Kirch 1994; Morrison 1994, 1996; Netting 1993; and others), yet the original theory receives continued support by archaeologists (e.g., Redman 1999; Stone 1996; Stone and Downum 1999). Despite the serious criticism, core elements of the original Boserup hypothesis continue to permeate contemporary interpretations of intensive agriculture, agricultural intensification, and their relationship to political economy in the archaeological record.

More recently, archaeologists have framed the evolution of agricultural systems, prehistoric agricultural intensification, and intensive agriculture within political economy.[2] As it applies to intensification of agriculture, the political economy approach has been labeled the neo-Wittfogelian Perspective (Erickson 1993; Stanish 1994). Although they may deny that the organizational demands of intensive agriculture (large-scale irrigation in Wittfogel's original

model) caused state formation and centralized despotic government, some archaeologists assume that the intensification process and resultant large-scale intensive agriculture would require elite involvement and management (e.g., Earle 1997; Johnson and Earle 1987; Kolata 1993, 1996, 2002; Scarborough 2003; Stanish 1994, 2003, 2004, this volume; and others). According to this perspective, leaders (the elite) have a vested interest in the smooth functioning and growth of agricultural production as the source of staple and wealth finance (i.e., surplus extracted as a form of payments or taxation). A related assumption is that farmers practicing the domestic mode of production will resist producing more than is needed for their subsistence needs, an assumption often justified by the Law of Least Effort or farmers' decisions about risk management (Chayanov 1966; Sahlins 1972). Thus, some have concluded that farmers are unlikely to generate surplus unless forced to by local leaders, chiefs, and/or kings (e.g., Stanish 1994). Elite demands for gifts, bribes, payments, or corvée labor are often institutionalized as tax, tribute, or rent and are enforced by legal sanctions and threats of violence. Variations on this theme stress elite encouragement and facilitation of farmers' surplus production by farmers through ideology, ritual sponsorship, and selective distribution of prestige goods and exotics rather than outright control and force (Johnson and Earle 1987; Kolata 1993; Stanish 1994, 2003, 2004, this volume). In most archaic state scenarios political leaders and their bureaucrats are assumed to provide the design, engineering, labor organization, management, and ideology for intensive agriculture. In this perspective agency is often attributed to the elite, while the common masses remain passive and faceless. This particular view about the relationship between intensive agriculture and centralized authority has become orthodoxy in contemporary archaeological applications of cultural evolution and political economy. The Boserupian idea of a continuum from extensive to intensive agriculture that has been assumed to map the cultural evolutionary stages as progress through bands to tribes and chiefdoms to state, is often recast as a continuum of political organization from simple to complex (e.g., Earle 1997, 2001; Johnson and Earle 1987; Redman 1999; Stanish 2003; and others).

The assumptions about the relationship between intensification and political economy that need critical reevaluation include the following:

Assumption 1. All large-scale, highly patterned farming systems are evidence of intensive agriculture and agricultural intensification.

Archaeologists assume that any large-scale, highly-patterned farmed landscape represents intensive agriculture and agricultural intensification (Figure 13.1). The term *intensive agriculture* is often applied superficially, nonspecifically, and uncritically to describe any agricultural system that is (1) on a large scale (what is "large" is poorly defined); (2) assumed to be labor intensive (or

Figure 13.1. Eroded landscape of precolumbian terracing and field boundaries that is still being farmed and modern settlement near Chisi, Lake Titicaca, Bolivia.

assumed to require considerable labor, and again, "considerable" is poorly defined); and (3) more formally structured than what is assumed to be extensive agriculture, such as dry-field or swidden agriculture (the obvious corollary to points 1 and 2). *Agricultural intensification* is an even more elusive term, but the concept usually is applied to any agricultural system that is expanding and/or becoming more complex and permanent in terms of landscape infrastructure.

Scholars of agricultural change have developed specific definitions for intensive agriculture and intensification and have identified physical signatures that are applicable in both archaeological and modern contexts. Most archaeologists confuse labor-intensive agriculture (high production yield with diminishing returns for labor invested per unit area of farmland) with intensive agriculture (continuously farming units of land with short or no fallow periods).[3] Many intensive agricultural systems (as defined by Boserup) are not necessarily labor intensive over the short or long term. In addition, the concept of agricultural intensification is often confused with agricultural expansion or extensification (Brookfield 2001:200).

Archaeologists often seem unaware of these definitions and the natural and social science literature that debates the merits of Boserup's assumptions about population pressure, Law of Least Effort, Law of Diminishing Returns, and the sequence of agricultural evolution (summaries include Brookfield 1972, 1984,

1986, 2001; Denevan 2001; Erickson 1993, 1996; Hunt 2000; Kirch 1994; Morrison 1994, 1996; Netting 1993). Comparative agricultural analyses that employ energetics, crop-production data, labor efficiency, cropping frequency, fallow cycles, sustainability, cost-benefit analysis, farmer decision making, and cultural context are available for most farmed areas of the world but are rarely consulted by archaeologists (examples for the Andes include Denevan 2001; Erickson 1996; Goland 1993; Hastorf 1993; Mayer 2002; Treacy 1994; and others). Merely identifying the presence of intensive agriculture tells us nothing about the process of agricultural intensification. To understand the process, documentation of previous states of the system is needed, and the temporal and spatial scales of analysis must be well defined.

Assumption 2. Large-scale intensive agriculture requires centralized sociopolitical organization in order to function. Corollary: Farmers and rural communities are incapable of creating and managing complex, regional-scale intensive agricultural works.

Wittfogel (1957) argued that the water-management requirements for large-scale irrigation agriculture drove specific state formation processes that resulted in despotic states and the Asian Mode of Production.[4] Although most contemporary archaeologists deny that water management caused the state, elements of Wittfogel's theory relating to the need for top-down management of intensive agriculture have subtly reappeared in political economy explanations of agricultural change. Large-scale, highly visible agricultural infrastructure (canals, dams, reservoirs, raised fields, terraces, silos, roads, walls, field markers, and other elements of the built environment) (Figure 13.2) are uncritically assumed to have been created through state initiatives and ideology (extorted gifts, redistribution, taxation, corvée labor) designed by elite designers, engineers, and administrators.

Historians, ethnographers, geographers, and some archaeologists have soundly criticized the assumption that centralized state political organization is a necessary condition for large-scale intensive agriculture (e.g., Butzer 1996; Denevan 2001; Doolittle 2000; Gelles 1995, 2000; Glick 1970, 1995:64–91, this volume; Hunt 1988, 1989, 1994, 2000; Isaac 1993; Lansing 1991; Mabry 1996, 2000; Mabry ed. 1996; Mitchell 1973, 1976; Mitchell and Guillet 1994; Netting 1993; Stone 1996; Trawick 2001, 2003; Treacy 1994; Wilkinson 2003, this volume). These scholars do not deny that hierarchy and alternative organizational structures, including heterarchy, exist and are often necessary for the functioning of intensive agriculture. These hierarchical and heterarchical structures can be found operating at the local and regional level through families, lineages, communities, moieties, and intercommunity cooperation, often outside of state control and interference. Many archaeologists have largely ignored these contributions from historical and ethnographic case studies.

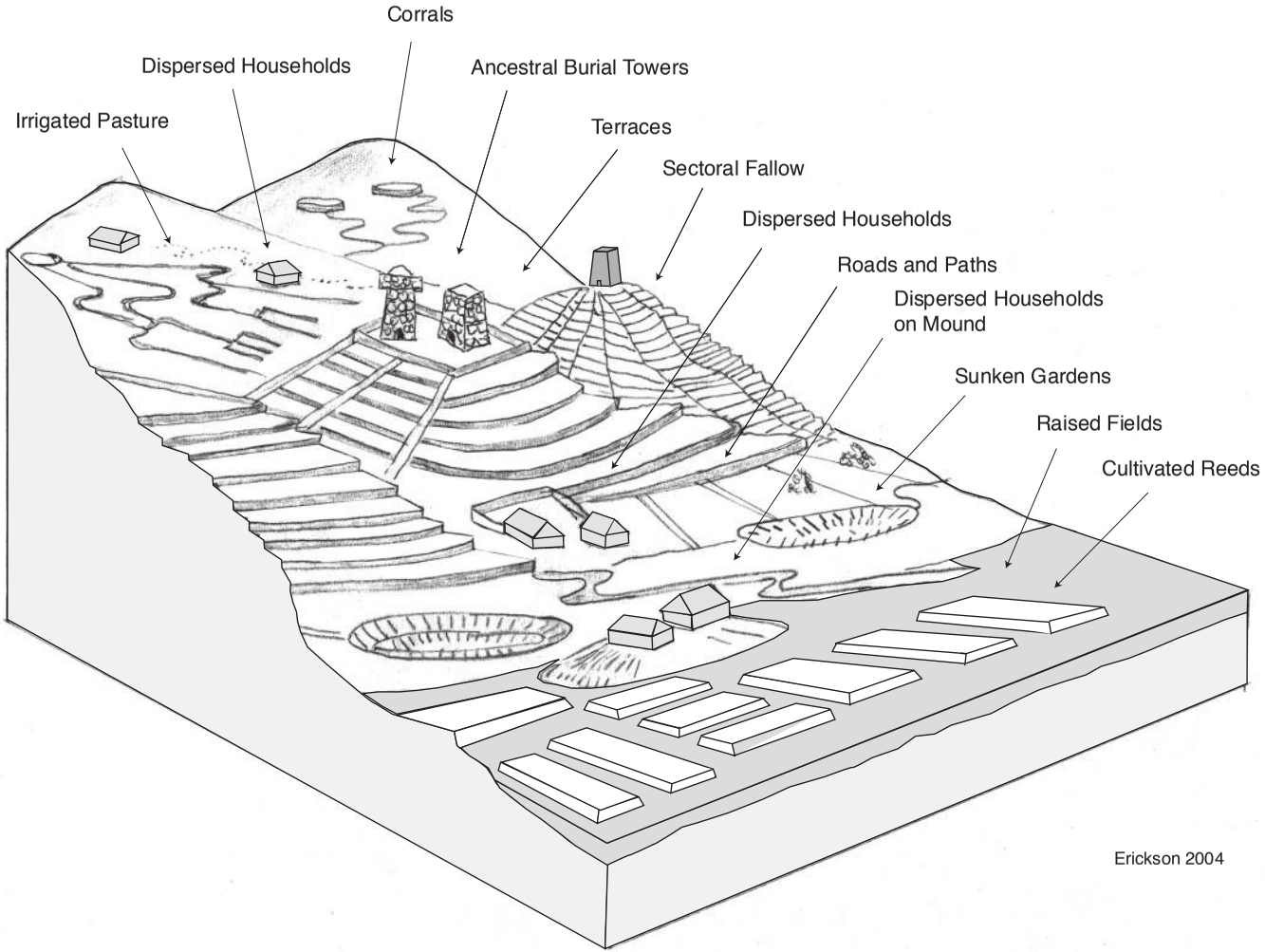

Figure 13.2. An idealized precolumbian cultural landscape in the Andean highlands of raised fields (*waru waru*, *suka kollu*), sunken gardens (*qocha*), terraces (*andenes*), irrigated pasture (*bofedales*), community burial towers (*chullpas*), paths, roads, and dispersed settlement (*llacta*, *marka*, *ayllu*). Drawing by C. L. Erickson.

Historical and ethnographic case studies of irrigation, the best-studied form of intensive agriculture, demonstrate that the social organization of irrigation is highly variable through time and space. Using cross-cultural comparison of irrigation societies at various levels of organization, Mabry and Cleveland (1996) show that locally organized irrigation systems usually outperform more centrally managed ones in terms of productivity (output per unit of land area over time) and efficiency (ratio of output per unit of input over time), in addition to being more stable over time. Numerous studies of state organization and management of intensive agriculture document poor performance, inefficiency, and environmental degradation (Brookfield 2001; Brookfield et al. 2002; Hunt 1988; Lansing 1991; Mabry 1996; Netting 1993; Scott 2001; and others). We may not conclude that locally organized intensive agriculture is always necessarily more successful, efficient, and environmentally friendly, but it is clear that centralized management is not necessary for intensive agriculture.

The assumption that local organizations cannot create and manage large-scale agricultural systems permeates most archaeological treatments of intensification and intensive agriculture (e.g., Kolata 1993, 1996, 2002; Stanish 1994, 2003, 2004 for Andean raised field agriculture). Many archaeologists are now willing to attribute a local origin and control to small-scale systems of intensive agriculture but still balk at attributing large-scale regional and interregional systems of intensive agriculture to farmer agency, skill, and knowledge.

Numerous case studies show that the assumption is false (Brookfield 2001; Brookfield et al. 2002; Denevan 2001; Doolittle 1984, 2000; Erickson 1993, 1996; Lansing 1991; Mayer 2002; Netherly 1984; Scarborough 2003; Trawick 2001, 2003; Treacy 1994; and others). Experimental archaeology and energetics studies clearly demonstrate that small groups organized at the family and community level are capable of constructing and maintaining intensive agricultural systems (Figures 13.3 and 13.4) (for raised fields: Erickson 1993, 1996; Erickson and Candler 1989; for terracing: Kolb 1997; Kolb and Snead 1997; Treacy 1994). Steven Lansing's *Priests and Programmers: The Engineered Landscapes of Bali* (1991) is a brilliant analysis of a huge integrated regional intensive agricultural system that operates without state control or direct involvement. Other clear examples of nonstate intensive agriculture include the irrigation systems of Mojave and Paiute hunting-gathering societies (Lawton et al. 1976; Steward 1930), the agroforestry management of Amazonian hunter-gatherers and small-scale farmers (Denevan and Padoch 1988; Posey and Balée 1989), and the raised fields of New Guinea "tribal societies" (Heider 1970; Serpenti 1965).

Figure 13.3. Potato harvest on a small family plot of raised fields in the community of Faon, Huatta, Peru. Remains of eroded precolumbian fields, canals, and settlement mounds extend to the horizon.

Figure 13.4. Potato harvest on communal raised fields by the community of Segunda Collana, Huatta, Peru. These reconstructed raised fields were part of an experiment in applied archaeology between 1981 and 1986.

Assumption 3. The coexistence of centralized political organization and intensive agriculture implies a causal or necessary relationship.

My critique of assumption 2 also applies to assumption 3. Textbooks on cultural evolution highlight intensive agriculture as an important trait of chiefdom and state-level societies (Earle 1997; Johnson and Earle 1987; Redman 1999; and others). Coexistence of intensive agriculture and complex societies is often confused with causation. Many, possibly most, intensive agricultural systems predate the appearance of political complexity characterized by the presence of chiefdoms or states.

Are the elite really interested in managing day-to-day farming matters? In some societies the answer is yes, in others no. There are clear archaeological cases where the state was directly involved in intensive agriculture and possibly the intensification process as well. Inca regional administrative and ceremonial centers and private estates are highly visible examples of the state's hand in creating intricate hydraulic infrastructure, transforming slopes into terrace walls and platforms, and establishing transportation networks and storage facilities (D'Altroy 2002; Hastorf 1993; Niles 1987; and others). Although highly visible and easily identified as Inca, these landscapes make up an insignificant portion of the total anthropogenic built landscapes of the Andes (Erickson 2000). In addition, the Inca often appropriated the preexisting landscape capital of hundreds of generations of farmers for their own use. Still, archaeologists uncritically attribute the transformation of Andean regional landscapes to the state, whether Inca or pre-Inca. Most scholars agree that Inca colonial policy was to expand agricultural production to new lands previously uncultivated (agricultural expansion) rather than to intensify agricultural production (agricultural intensification) per se (D'Altroy 2002; Murra 1980). The practical explanation for this practice is that the Inca did not want to disrupt what already existed as highly efficient production of local communities. I do not deny that in some cases agricultural intensification may have been an important factor in state origin, maintenance, and expansion. All states rely on production of surplus by peasant farmers for their existence. However, the details of how (and whether) state organization and intensive agriculture are causally related clearly vary from case to case.

Assumption 4. Agriculture evolves in a unilinear, stepwise pathway from extensive to intensive agriculture.

Boserup argued for a unilinear evolutionary continuum from extensive to intensive agriculture as measured by cropping frequency. Archaeologists have correlated this evolutionary scheme with that of sociopolitical organization. Simple societies are assumed to practice hunting-gathering-fishing subsistence strategies and/or extensive agriculture (primitive gardening, slash-and-burn agriculture, simple agroforestry), whereas complex societies practice intensive

agriculture (irrigation, raised fields, and terracing) (e.g., Earle 1997; Johnson and Earle 1987; Redman 1999). Some scholars present the degree of agricultural intensification as a part of the definition of each cultural evolutionary stage and at the same time invoke it as a partial cause for the stage. This inherently circular argument assumes that the centralized state is a necessary condition for intensive agriculture and that centralized states are characterized by intensive agriculture.

Historical ecologists have questioned these unilinear cultural evolutionary assumptions (Balée 1989, 1994; Denevan 1992a, 2001; Erickson 1996; Lathrap et al. 1985). Some intensive forms of agriculture (agroforestry, house gardens, drained fields) appear early in the archaeological record (e.g., Denham et al. 2003; Neumann 2003, for New Guinea; Leach 1999, for the Pacific) while extensive agriculture such as swidden (slash and burn) may be a relatively late phenomenon (at least in the Americas owing to historical introduction of metal axes [Denevan 1992a, 2001; Lathrap 1977; Lathrap et al. 1985]). Ethnographic, historical, and prehistoric case studies show that most farming societies practice a wide range of extensive to intensive agricultural practices concurrently (Figure 13.2).

Extensive agriculture is assumed to have preceded intensive agriculture, but its archaeological existence remains much more elusive than intensive agriculture; indirect evidence such as pollen records, burning, and stone axes are sometimes alluded to (e.g., Piperno and Pearsall 1998). More commonly, the signature of nonintensive agriculture is identified as the "negative" of intensive agriculture: an absence of visible built environment infrastructure such as field boundaries, canals, or terraces.

Assumption 5. Farmers refuse to produce a surplus unless forced to do so by higher authority.

Boserup (1965) proposed that the Law of Least Effort underlay the evolution of agriculture. In other words, farmers will commit the bare minimum of labor effort toward agricultural production unless forced to do more (in her model, by population pressure). This basic assumption overlaps with one of the core assumptions of intensification in political economy. Marshall Sahlins (1972) and A. V. Chayanov (1966) proposed that farmers, left on their own, would not produce beyond their subsistence needs; thus, local leaders, chiefs, and kings must motivate farmers to produce a surplus for sustaining their activities, craft production, trade, rituals, and urban centers (Dietler and Hayden 2001; Earle 1997; Johnson and Earle 1987; Kolata 1993; Stanish 1994).

Robert Netting (1993) has presented a sound critique of the Sahlins and Chayanov assumptions. Most ethnographic or historical farming societies produce beyond the subsistence level and domestic sphere, and those that do not are probably under extreme stress and pressure beyond their control. The

reasons farmers decide to produce more than needed for immediate subsistence are complex (Brookfield 2001; Brookfield et al. 2002; Denevan 2001; Kirch 1994; Netting 1993; Zimmerer 1996; and others). Scholars have documented past and present "noncomplex societies" that produced surpluses to meet a variety of social demands without elite motivation (Bender 1985; Brookfield 1984, 2001; Hastorf 1998; Lathrap et al. 1985; Netting 1993). The earliest monuments, long-distance trade, and intensive agriculture, oft cited as evidence of surplus production, appeared in nonhierarchical, stateless societies (e.g., Burger 1992, for South America; Shady Solís et al. 2001).

Assumption 6. Intensive agricultural production is more efficient if centralized and bureaucratized.

Archaeologists generally assume that the state provides cost-effective strategies for managing intensive agriculture. One goal of the state is to regularize the flow of agricultural surplus into state coffers. This often involves the development of bureaucracy for efficient tribute and tax collection but rarely direct involvement in agricultural production.

In fact, numerous scholars working with historical and ethnographic case studies show that when states meddle with traditional peasant farming, agricultural efficiency is often lost (Brookfield 2001; Lansing 1991; Netting 1993; James Scott 1998). In his cogent analysis of state mentality, Scott (1998) demonstrates how modern state experiments in collective agriculture, the Green Revolution, and other top-down centralized schemes have utterly failed.

Assumption 7. The presence of a settlement hierarchy is evidence of centralized political control and administration of agriculture.

Archaeologists assume that settlement hierarchies of three to four tiers are evidence of centralized political organization (chiefdom and state societies). The presence of higher order settlements within areas of intensive agriculture is believed to be the signature of direct state management and administration of rural communities (e.g., Kolata 1993, 1996, 2002; Stanish 1994, 2003, for the Andes). However, the relationship between variation in settlement pattern and intensification of agriculture remains poorly known and rife with black-box assumptions. The ethnographic and historical record can provide historically contingent and cross-culturally testable models for the relationships among settlement, farmer cooperation, labor, and intensive agriculture (Figure 13.5) (Brookfield 2001; Erasmus 1956; Goland 1993; Netting 1993; Stone 1996; and others).

Increasing political centralization does correlate with the archaeological record of changes in rural settlement patterns, domestic production strategies, architecture, and distribution and access to certain items of material culture. I do not deny that these changes can often be positive in the lives of common farmers. However, the possibility that hierarchical settlement patterns

Figure 13.5. A gathering of representatives from two communities in 1986 (Aymara farmers from Ilave on left, Quechua farmers from Huatta on right) to exchange ideas and experiences about rehabilitating and putting pre-Columbian terraces and raised fields back into production in Huatta, Peru.

(indicating a centralized political economy) and intensification are independent should also be considered. In Andean prehistory regular cycles of centralization and decentralization are more common than long periods of political stability (Marcus 1998; Moseley 2001; Willey 1991; and others). States are ephemeral, most lasting only several hundred years, with longer periods of smaller-scale local and regional sociopolitical organization. States come and go while rural farm life often continues relatively unaffected (as manifested in the lower rungs of settlement patterns, farming systems, material culture, and household architecture). For most farming peoples those periods without strong centralized states may have been ideal.

A LANDSCAPE APPROACH TO AGRICULTURAL INTENSIFICATION

Site- and settlement-based archaeology continue to dominate our view of the past (Figure 13.6). Landscape remains invisible to most archaeologists in their diligent search for what they see as the most relevant data: pottery scatters, settlements, standing architecture, and monuments. I believe that landscapes provide a radically different and productive approach to understanding the past and, particularly, to explaining intensification and intensive agriculture (Figure 13.7).

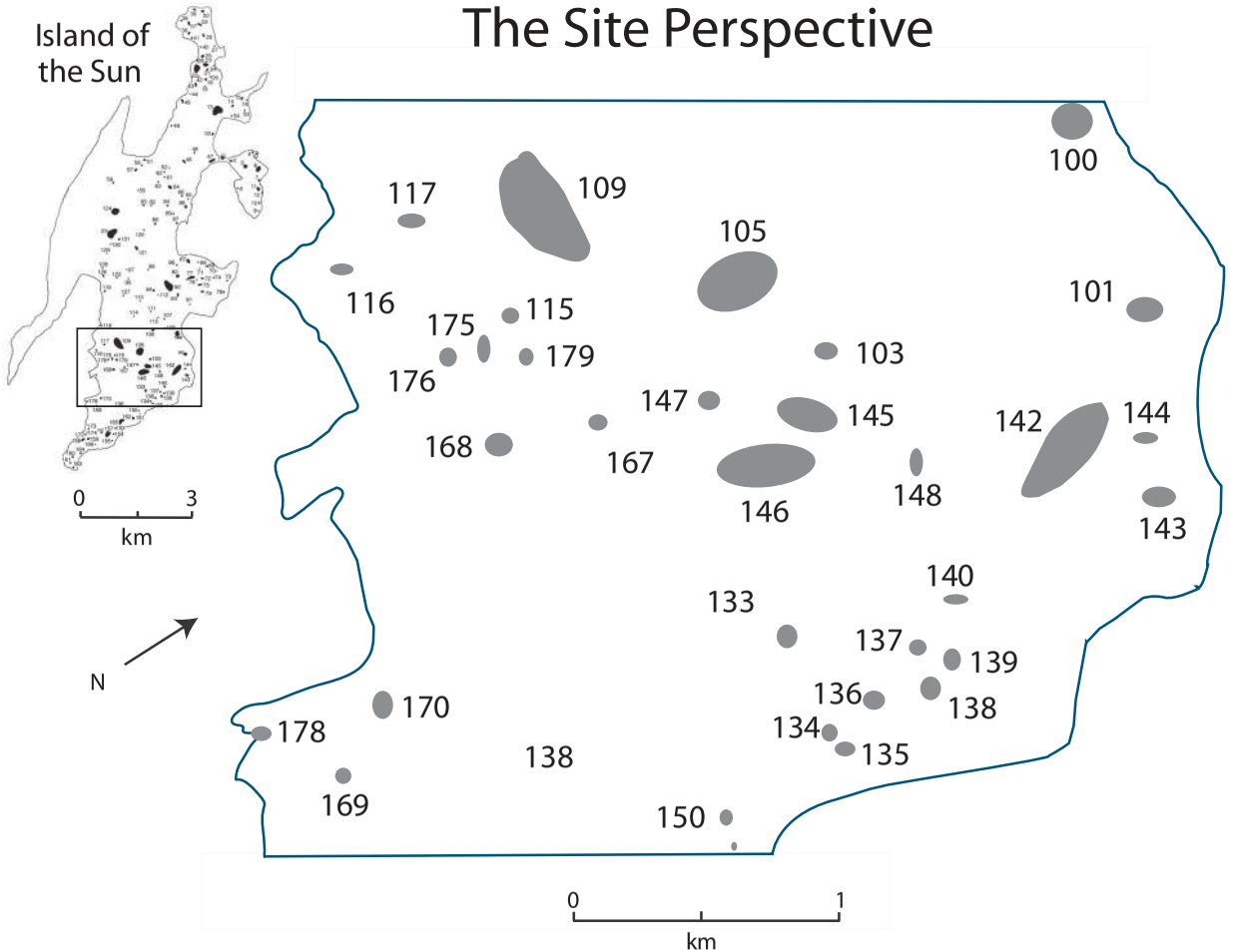

Figure 13.6. The site perspective: distribution of archaeological sites on the Island of the Sun in Lake Titicaca, Bolivia. Sites defined by artifactual surface debris and/or standing architecture during the settlement survey are mapped and plotted to be categorized by period, size, and function into a site hierarchy ranking that reflects the political economy and cultural evolutionary stage (adapted from Bauer and Stanish 2001:Map 4.4).

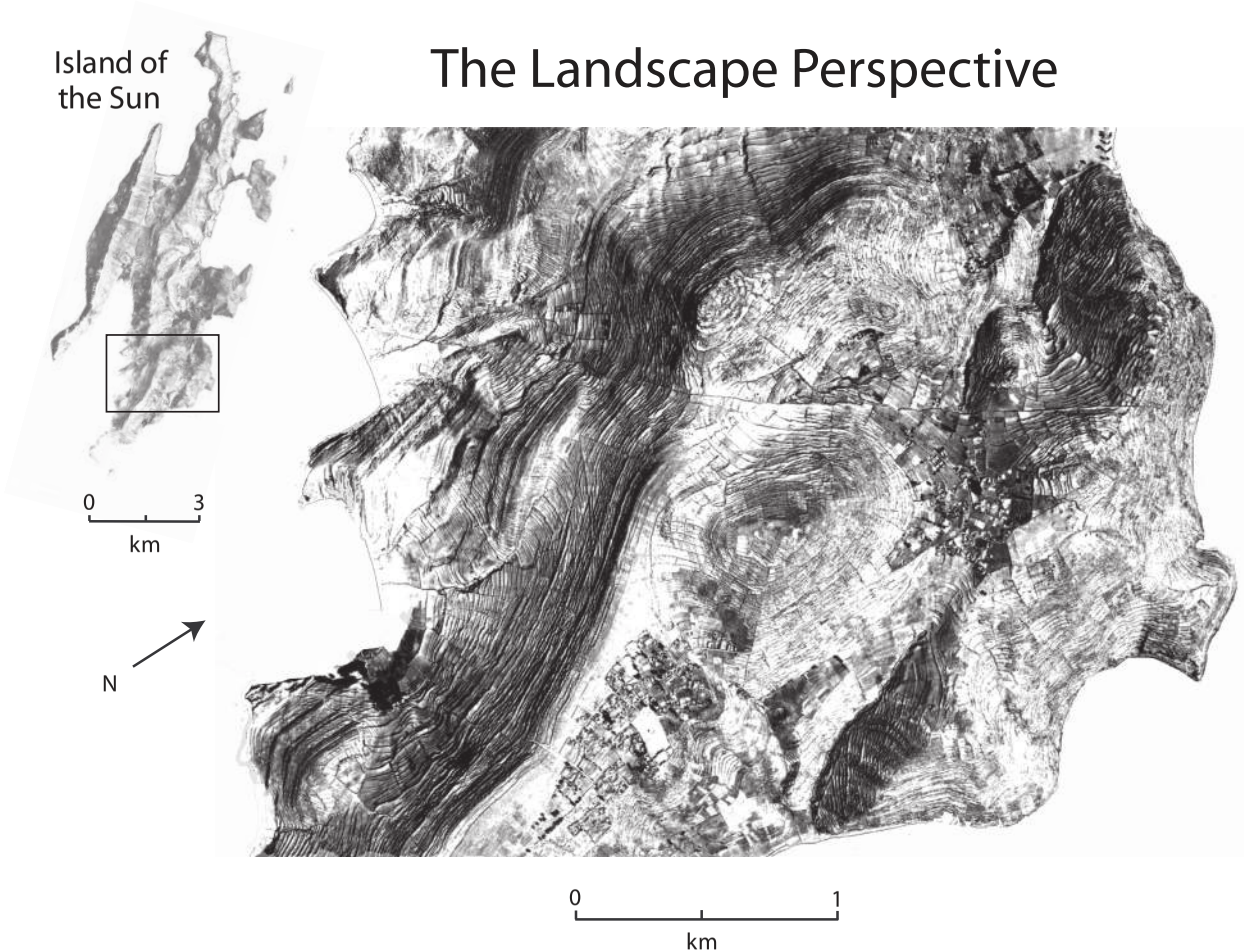

Figure 13.7. The landscape perspective: an anthropogenic, engineered landscape on the Island of the Sun in Lake Titicaca, Bolivia. The complex patterning and palimpsest of landscape features that cover nearly the entire island include thousands of stone-lined terrace fields on the steep slopes, walls running upslope and down marking field and community boundaries and sectorial fallow systems, webs of ritual roads and everyday paths, irrigation canals, corrals, and house gardens. By any measurement the engineering and labor invested in this built environment is monumental in scale.

I argue that the political economy approach denies agency to farmers and underestimates their knowledge and cumulative efforts in creating vast areas of anthropogenic landscape. I have contrasted the perspective of a settlement pattern analysis based on the site concept and informed by political economy, with a landscape perspective informed by indigenous knowledge systems, characterizing them as "top-down" vs. "bottom-up" approaches (Erickson 1993; Scarborough 1993). The archaeology of landscapes and historical ecology can provide a bottom-up farmer-centric perspective of the past. The bottom-up perspective (in contrast to the elite perspective of political economy) draws heavily on the works of Robert Netting, William Denevan, William Doolittle, Harold Brookfield, Stephen Lansing, Robert Hunt, Karl Zimmerer, Enrique Mayer, William Balée, Barbara Bender, Christopher Tilley, James Scott, Carole Crumley, Patrick Kirch, Kathleen Morrison, and others.[5] This approach is informed by theories of practice, structuration, agency, structuralism, and poststructuralism, and it relies on the concepts of space and place, historical ecology, indigenous knowledge systems, heterarchy, smallholders, landscape capital, inhabitation, resistance, and historical contingency. Its methods include energetics studies, experimental archaeology, ethnoarchaeology, multiscalar analysis, phenomenology, and pattern recognition. The archaeology of landscapes builds arguments from patterned physical evidence from the scale of activity area, to region, and beyond.

Intensive agriculture and the process of its intensification are natural subjects for landscape-based investigation. Most activities of farm life that are pertinent to intensive agriculture are not settlement based; rather, they occurred in that elusive gray zone imperceptible to archaeologists focusing primarily on sites (Figure 13.8). Because intensive agriculture and intensification are often associated with dense populations, heavy investments of landscape capital, formal bounding of fields and territories, and maintenance of ancestor cult architecture, their signature is permanently embedded in the physical landscape as highly patterned structures. These structures, in turn, channel the movements and actions of human actors on the landscape. As a form of built environment, the design, structure, and scale of landscapes of intensive agriculture are equal to or beyond the prehistoric architecture that we traditionally study (Figure 13.9). Landscapes are multicomponent, most having been occupied for thousands, if not hundreds of thousands, of years. Because the signature of intentional and unintentional human activities is so strong, pervasive, and sustained over long periods of time, landscapes are incredible palimpsests of both continuous traditions and abrupt disjunctures of habitation, land use, and sociopolitical systems.

Figure 13.8. Quechua farmers in Huatta, Peru, constructing raised fields using the Andean foot plow (*chakitaqlla*) to cut sod blocks elevating planting platforms and digging intervening canals. A stone or wooden bladed version of the tool was used prehistorically to create the Andean landscapes illustrated in the figures of this chapter.

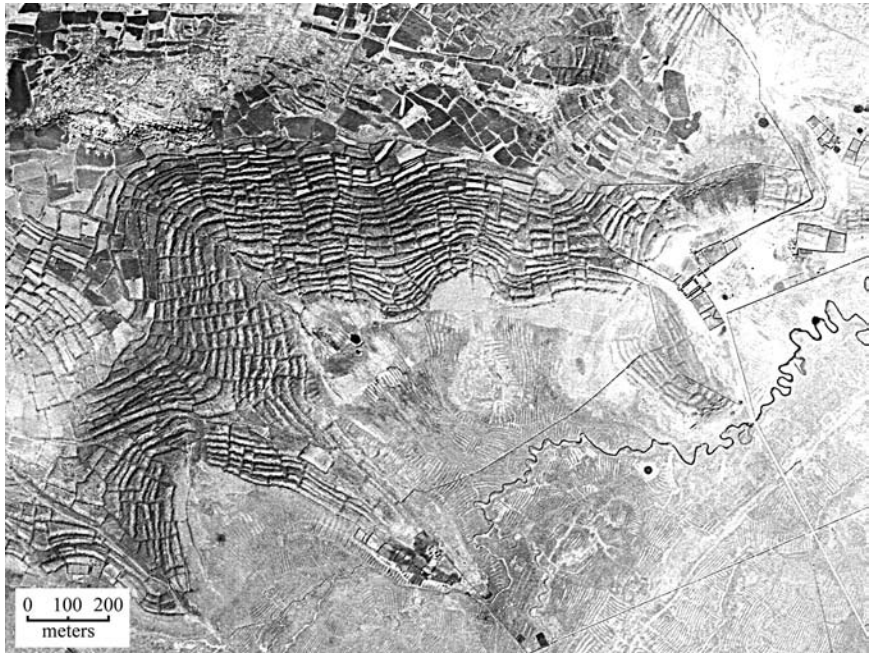

Figure 13.9. An integrated, engineered landscape of terraces (upper left) and raised fields (lower right). The landscape capital includes construction of many linear kilometers of terrace and field-boundary walls, movement of massive volumes of earth, and reworking of soil horizons to a depth of 1 meter or more.

Landscape and settlement archaeology continue to explore new ways of using the archaeological record to understand intensification. While the archaeological signatures of fallow periods, cropping intensity, labor, sustainability, demography (population size, density, pressure, and carrying capacity), farmer decision making, risk management, and social organization can be elusive, a focus on the archaeology of landscape, community, property, and everyday life and on historical ecology can provide new conceptual frameworks and methods (Balée and Erickson in press; Brookfield 2001; Canuto and Yaeger 2001; Denevan 2001; Doolittle 2000; Erickson 1999, 2003a, 2003b; Kolb 1997; Kolb and Snead 1997; Stone 1996; Whittmore and Turner 2002; Zimmerer and Young 1998; and others).

A landscape of intensive agriculture is best described as completely "anthropogenic." I consider the farmed landscapes of the Andes and Amazon where I work to be clear examples of designed, engineered, constructed, and humanized landscapes, a class of built environment and archaeological artifact that involved labor input over long periods, an accumulation of landscape capital, and multigenerational knowledge (Figure 13.10). Landscapes were built over temporally long scales, starting with systematic burning, forest and grassland management, and dispersal of plants and animals by hunting and gathering peoples 12,000 years ago in the Americas and hundreds of thousands of years ago in other parts of the world. Sedentism and farming brought new and massive transformations of the landscape. Complex agrarian landscapes are built through a process of accretion (Doolittle 1984). Farmers continuously make land improvements that are passed down to succeeding generations. In other cases farmers may have degraded environments through their transformation of the landscape (e.g., Denevan 1992b; Redman 1999; Stahl 1996; Whittmore and Turner 2002). Following Brookfield (Blaikie and Brookfield 1987; Brookfield 1984, 2001), I refer to these improvements as accumulated landscapes or landscape capital (also referred to as landesque capital).

A farmer-centric perspective on intensification highlights the long-term processes of design, construction, and imposing territoriality in the form of permanent field lines, paths, roads, field walls, boundary markers, plow patterns, field dimensions, and orientations (Figure 13.11). The concept of the palimpsest, analogous to stratigraphy, is useful for sorting out multiple meaningful cultural patterns and disjunctures embedded in anthropogenic landscapes. Similar to potsherds, chipped stone, and architecture, farmed landscape features are artifacts that can be described, dated, analyzed, and interpreted according to style, variation, patterning, context, distribution, and meaning.

While intensive agriculture has been the focus of study, the archaeological identification of extensive agriculture remains underdeveloped. The study of both extensive and intensive agriculture requires historically contingent

Figure 13.10. A highly patterned, anthropogenic landscape covered with a palimpsest of terraced and raised fields, boundary walls, paths, roads, and dispersed settlement that has been continuously inhabited for more than 10,000 years near Lake Umayo, Peru. Note the radial lines of walls from the low hill in the center of the image (aerial photograph of same landscape as Figure 13.9).

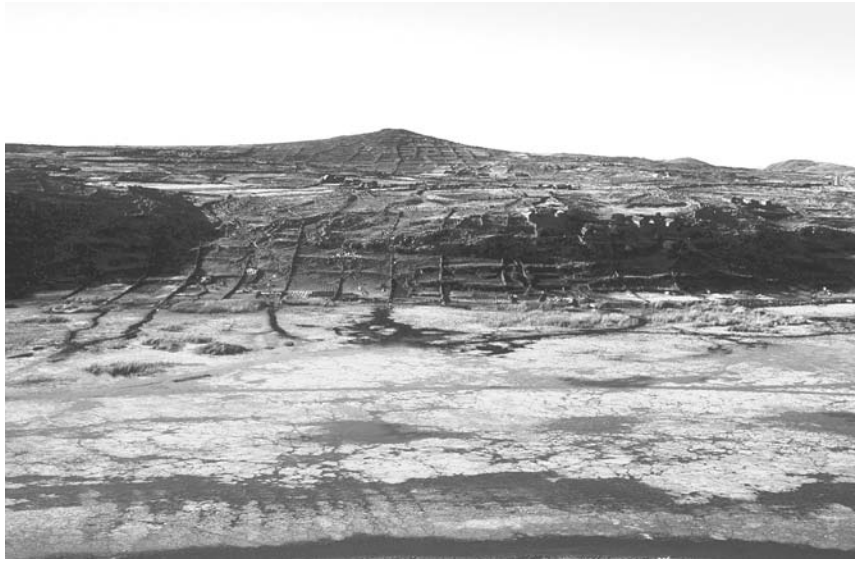

Figure 13.11. Terraces (upper half) and raised fields (lower half) at the edge of Lake Umayo, Peru. The linear walls radiating from the hill are divisions used by the community to rotate crops and fallow over seven-year cycles (ground view of same landscape as Figure 13.9).

and cross-cultural ethnoarchaeological, ethnographic, and historical studies on physical signatures and spatial dimensions of farm labor, land tenure, and property. To resolve these issues, we need better models of the physical archaeological signature of territory, community, property, and land-based lineage in settlement patterns and landscapes (Adler 1996; Bintliff 1999; Canuto and Yaeger 2001; Earle 2000; Hunt 1998; Hunt and Gillman 1998; Kolb and Snead 1997; Marcus 2004; Pyburn 1998; Stone 1996; Walker 2004).

I am not against cross-cultural comparison and application of general analogy to issues of agricultural intensification (excellent cross-cultural treatments include Adler 1996; Brookfield 2001; Denevan 2001; Earle 2000; Kirch 1994; Morrison 1994, 1996; Netting 1993; Stone 1996; and others). I do question the uncritical imposition of generic hierarchical models of political economy that are often derived from the largely discredited assumptions of Boserup, Wittfogel, and the "Mesopotamian Model" of political economy, settlement pattern, and cultural evolution that is applied to the rest of the world. In most areas local detailed ethnographic and historical data are more appropriate starting points for developing testable analogies, models, and hypotheses. I also resist interpretations that deny farmers credit for their works and engineering knowledge and skills. Vast anthropogenic landscapes are all too often attributed to the agency of elites or corporate groups without critical examination. Archaeologists have a unique opportunity to provide insights about the "people without history," but the opportunity is rarely realized through approaches that stress cultural evolution and political economy.

A PEOPLE-CENTRIC APPROACH TO AGRICULTURAL INTENSIFICATION

Who makes the decisions regarding intensive agriculture? In critiquing the political economy approach used by most archaeologists, I may have argued too strongly that all core decisions and strategy planning are made at the level of farm family and community. Ethnography and history show that both the local population and the state directly and indirectly affect the practice of farming. Farm families and communities tap into vast stores of multigenerational indigenous knowledge, social institutions of labor organization and management, ritual and symbolic systems, and capital embedded in the land from improvements contributed by their ancestors. Their decisions and behavior may or may not follow Chayanov and Sahlins-esque assumptions of political economists.

The bottom-up perspective is merely one perspective among many that are possible. It does not claim to provide all ultimate answers, but it does provide an important and useful counterbalance to some of the perspectives that have become so dominant in the field that they have blinded us to other possibilities.

I do not deny that there might be a relationship between political economy and intensive agriculture, but I do believe that the relationship should be demonstrated rather than simply assumed.

I do not argue for a romantic, idyllic view of happy, cooperative peasants. Real farming communities are rife with endemic tension, infighting, violence, and inequality. Contemporary and historical studies of rural farmers document how their difficult lives are characterized by exploitation, civil unrest, class conflict, land and civil rights struggles, and other problems. Intensive farming on ancestral lands, and the resultant investment in landscape capital, tends to tie farmers to their land. Intensive agriculture makes it easy for local leaders, governments, and expansive empires to control and extort taxes from farming communities (Carneiro 1970; Gilman 1981; Webster 1990; and others).

Peopling the past is a radical alternative to viewing farmers as faceless masses, the passive recipients of what the elite impose on them through direct coercion or state ideology. More important, this approach highlights the cultural links between the past and contemporary peoples of many of the regions of the world where we work (Figure 13.12). It also has important applied implications for empowerment, recovery of knowledge systems, sustainable technology and land use, indigenous land claims, ethnic identity, biodiversity, and the cultural revitalization of living communities (Erickson 2003b).

Figure 13.12. Members of a Quechua women's weaving cooperative resting after a day of constructing communal raised fields in Huatta, Peru.

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NOTES

1. For excellent summaries of Boserup's hypothesis on agricultural intensification see Morrison (1994), Netting (1993), and Stone (1996).

2. Feinman and Nicholas (2004) provide a survey of archaeological approaches to political economy.

3. The distinction between intensive agriculture and labor-intensive agriculture is important. Both are germane to issues of sociopolitical evolution because the former relates to increased surplus potential with no necessary decrease in labor efficiency (a non-Boserupian assumption that characterizes many highly productive traditional farming systems) and the latter to increased surplus potential under decreasing labor efficiency with implications for the control of labor (a Boserupian assumption). These issues are discussed in detail in Netting (1993) and Erickson (1993, 1996).

4. Wittfogel (1957) clearly distinguished between hydraulic societies (those practicing large-scale irrigation that develop into centralized, despotic states) and hydroagricultural societies (those practicing small-scale irrigation that do not develop into centralized, despotic states) (see also Isaac 1993; Mitchell 1973, 1976; Price 1994; Scarborough 2003). Archaeologists applying the neo-Wittfogelian perspective to archaeological cases generally collapse the two categories.

5. See, e.g., William Balée (1994); Balée and Erickson (in press); Barbara Bender (1998); Harold Brookfield (2001); Brookfield et al. (2002); Carole Crumley (1994); William Denevan (2001); William Denevan and Christine Padoch (1988); William Doolittle (1984, 2000); Robert Hunt (1988, 1989, 2000); Patrick Kirch (1994); Stephen Lansing (1991); Enrique Mayer (2002); Kathleen Morrison (1994, 1996); Robert Netting (1993); James Scott (1998); Christopher Tilley (1994); Paul Trawick (2001, 2003); and Karl Zimmerer (1996).

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