Further Reading


Agricultural Societies

All societies are pluralistic, encompassing multiple organizational and technological systems. In an agricultural society a substantial part of the means of human subsistence comes from one or more agricultural systems (i.e., systems of domesticated plants and animals that depend upon a specific technology and system of management).

Ecologically, the major agricultural systems can be divided broadly into Old World and New World types. Organizationally, they divide into household/peasant, elite, and industrial. A society’s agricultural systems interact with its kinship, political, religious, and economic systems, among others.

Within each organizational type in each ecological framework, agricultural systems differ in degree of intensity. Intensity means the total of inputs to and outputs from each unit of land, and can be measured in terms of calories of energy. The most general trend in the development of agricultural systems is an interaction between population and intensification. Within the framework of a system, population builds up and intensification increases until it reaches its internal limits of sustainability. At that point the system either changes to permit further intensification or it collapses.

Contrasting Ecologies

The difference between Old World and New World agricultural ecologies lies in the different ways they renew soil fertility. In long-fallow systems worldwide, such as swidden agriculture, this is accomplished by natural organic processes of plant growth and decay. By planting a field that has lain fallow the farmer brings the crops to the accumulated fertility. In short-fallow systems, by contrast, fertilizer must be brought to the crops. In Old World systems, this is accomplished with domestic animals, mainly ungulates. By converting parts of the crops the farmer cannot use into materials and foods that he can use, the animals reduce the total cropped area needed while their manure restores fertility. They provide additional organic material by the common practice of grazing beyond the farmed area in the day and returning at night. A variant of this system, important in Africa where the tsetse fly makes it impossible to keep cattle in fixed locations, is a symbiotic relation between mobile herdsmen and sedentary farmers in which farmers allow the herdsmen to graze cattle on their stubble in exchange for the herder keeping the cattle overnight on the farmer’s land.

New World agricultural ecologies do not incorporate domesticated animals and hence have no manure cycle. Instead, fertilizing materials are generally brought to the fields by some form of water transport. This is done in two main ways: with water collection and with chinampas, floating beds in lakes and swamps. Water collection mainly involves either waterborne silt from rivers carried in irrigation channels or flow from volcanic ash fields or eroding rocks. Although New World farmers recognized the value of organic methods such as fish buried with the
seeds, these generally demand too much labor to use on a large scale.

Without domesticated animals, there were relatively few places in the New World where a society could depend wholly on agriculture, and those were surrounded by large areas where societies continued to be organized for hunting and gathering—sedentary pockets surrounded by mobile raiders. By contrast, agricultural communities of the Old World spread into much more of the total landscape, settled it more densely, and consistently obliterated the hunting and gathering communities that remained in between their settlements. This difference had important consequences for the way their respective organizational systems developed.

**Old World**

Settled communities cultivating wild plants first appeared in the Old World about 10,000 BCE. Domesticated versions of these same wild plants first appeared in such communities around 7000 BCE, in the “fertile crescent” around the Jordan valley and on the flanks of the nearby Taurus and Zagros mountains; they included emmer and einkorn (ancient varieties of wheat), barley, lentils, chickpeas, pea, bitter vetch, and flax. Domesticated animals appeared shortly thereafter: sheep, goats, humpless cattle, horses, and pigs. The presence of domesticated plants necessarily implies that farmers are planting each new crop from seeds harvested previously. Once this practice is established the crops can be spread into wholly new areas and evolutionary change can occur rapidly.

Agriculture spread by both diffusion of ideas and cultivars from group to group and by the migration of whole groups, with migration apparently the most prominent of the two processes. Domesticated crops reached the Balkans in the seventh millennium BCE, brought by immigrants. Farming villages appeared in southern France by 5000 BCE. Beginning about 5400 BCE agricultural villages of a distinctive culture called Bandkeramik spread from the area of Hungary to the Netherlands. The first agricultural settlements in South Asia appeared in the beginning of the seventh millennium BCE in what is now southern Afghanistan, with a Middle Eastern mixture of

---

**The Annual Cycle**

*The annual cycle of preparing the fields, planting, and harvesting has always defined life in farming communities. The following extract summarizes the annual farming cycle in a farm village in central Turkey.*

As soon as the spring comes, the men get busy. The oxen weakened by the long winter must be got into training work, and spring ploughing and sowing must be done. The ox-herds and shepherds take charge of the animals. The sheep are lambing and in each household a woman must be ready at midday to milk the ewes. Ploughing and sowing of spring wheat and barley is immediately followed by the ploughing of the year’s fallow, which goes on perhaps into May, even until June, depending on individual circumstances. Meanwhile the vineyards must be dug over, and potatoes and other vegetables sown. Most of this later work is done by women.

In June, all grasses and weeds growing in odd places among the crops are cut for hay, again mostly by women. During late May and June the men are comparatively idle. In July the harvest begins, first with vetch and lentils, them with the main crops of rye and wheat. Threshing follows the reaping; reaping, threshing, and storing together last about two months of ceaseless activity for everyone; a whole household frequently works right through a moonlit night.

In September the pressure eases. As soon as rain falls on the hard baked ground—even before, if the rains are late—the men must plough again and sow their winter rye and wheat. By November there remains for the men only a visit to town to lay in supplies of coffee, paraffin, salt and so on, and perhaps cheap vegetables for the months of winter isolation, and then idleness again until the spring. He was overstating his case and, as someone commented, in two months’ harvesting they do four months’ work; but the idea of having, like an English agricultural labourer, to work for wages day in and day out all year round was greeted with horror.

crops and animals. However, roughly contemporary agricultural settlements in the Vindhyan Hills, just south of the Ganges plain, grew rice. Agricultural communities appeared in the Chang (Yangzi) valley in China from 7000 to 5800 BCE, growing rice in the lower part of the valley and millet in the upper. The millet was domesticated; it has not been determined whether the rice was. Domesticated grains appear much later in Japan and Southeast Asia, but in the former case, at least, this is because of the importance of tubers, particularly taro.

The archaeological remains of these early communities are consistent with peasant/household organization: small unwalled hamlets or villages with houses either adjoining or separate, with storage pits or areas and sometimes ceremonial areas. There is typically little evidence of social stratification, but there are usually burial practices that suggest that the presence of one’s ancestors implied entitlement to property. Taking into account ethnographic analogies, the configurations generally suggest a three-tier organization based on household, village, and various forms of kinship based on organization generally described as “tribal.” Households, probably often connected to each other by kinship, farm their own plots of land with village agreement and cooperation. Groups of villages recognize themselves as affiliated and are mutually supportive but lack any formal overriding structure.

Elite agriculture first appeared about 3000 BCE, along with city-states, bronze tools and weapons, large-scale
irrigation, and the first forms of writing. It took the form of a hereditary military aristocracy and an at least partially hereditary priesthood, each of whom had specific governmental powers, and large estates set aside to support those powers. Sumerian records describe large-scale “grain grinding households” and “weaving households,” associated with the “patrimonial sovereign” and the temple, producing textiles and foodstuffs (Gregoire 1992, 225). They used corvee labor drawn from the peasants, and the accounts show that it was the responsibility of the temple and palace to provide for their maintenance while they were working. The Iliad describes Agamemnon as maintaining a similar establishment, but using the labor of slaves taken in war. Conflicts between city-states led to ever fewer and ever larger alliances, and by 600 BCE this process ended with the transition to imperial systems, in which the conquering power no longer sought the destruction of the opposed city-states but rather sought to subordinate them in a larger hierarchy of command and privilege.

The South Asian chronology was similar. The Indus Valley Civilization, beginning around 2300 BCE, was a uniform and well-organized peasant society in which communities cooperated as part of a single system. It collapsed in about 1790 BCE, however, after an earthquake diverted one of the two main rivers it was built on upon. The population apparently dispersed into surrounding areas, particularly the Ganges plain, retaining agricultural continuity but losing social cohesiveness. In the Ganges valley, there were no fewer than sixteen walled cities by 600 BCE, engaging in mutual conflict comparable to that of the Mesopotamian city-states. By 321 BCE, this conflict had led to the establishments of the Mauryan empire.

In China, walled cities appeared with China’s first dynasty, the Xia, and continued into the succeeding Shang (1766–1045 BCE). Beneath the Shang monarch as a general hereditary overlord were large numbers of local rulers holding hereditary title, the first form of the Chinese distinction between the peasantry and the privileged gentry.

All of the imperial systems involved some mixture of elite extraction from peasant production side by side with large-scale enterprises under direct elite control, usually operated with unfree labor. The pattern persisted when the Asian empires were absorbed into European colonial systems. Before then, however, there was a development that was to have fundamental long-term implications for the way the different imperial systems evolved and interacted: the development of democratic constitutions at the city level.

The central aim of the Roman idea of a republic was to find a way to balance the interests of the peasant agriculture of the plebes with the elite agriculture of the gentes in a single political system that guaranteed security for all. The solution was carried to the many Roman colonies in the territories that the republic conquered. It persisted in the form of their civic constitutions after the empire collapsed and evolved as these Roman enclaves evolved into towns of the various European nationalities we recognize today. But in the course of this evolution there was a radical realignment of interests. Where the original Roman senatorial fortunes were based on elite agriculture utilizing land taken in war, Renaissance fortunes were based on commerce. Their interests, therefore, no longer supported imperial power and opposed independent peasant farmers but the reverse.

Outside of what had been Roman Europe—in Russia, South Asia, Southeast Asia, China, and Japan—towns remained under the control of the imperial authorities, a situation that supported elite agriculture. The consequence was that the peasantry often had no way to avoid serfdom, and there was no one to serve as the kind of independent engine of technological innovation that led Europe first to expand trade, then to destroy feudalism, and finally to industrialize.

Although programs for land reform that began in the late eighteenth century were aimed at freeing peasant agriculture from accumulated elite impositions, these were not notably successful outside the West. The Communist revolutions in Russia and China replaced whatever autonomous peasant organization remained in their respective areas with collectivization as a new form of elite control, at significant cost in lives and productivity. Since World War II, however, colonial empires and the
The Sacred Digging Stick

Religious rituals to help insure a good crop have always been an important element of planting and harvesting in farming communities around the world. The following example is from the Tikopia of the South Pacific.

The next morning everyone of the yam group had to be awake long before dawn, for this was the day of planting. I was told “the yam is planted in the night” —a statement too near truth for my comfort. The reason given was “the yam should be hidden in the woods” before people stirred in the villages, so that the paths might not be contaminated by ordinary affairs. It was said that this was the command and practice of the Atua i Kaika, though no express utterance to this effect was known.

On each occasion I came over from my house in Faea soon after four a.m. When the people of the household had been roused from sleep one man was sent off first with the koso tapu, the sacred digging stick, a piece of wood some seven feet long, pointed at both ends, one of which was ornamented by some roughly cut notches.

This implement is one of the most intensely sacred articles in the island. Through its association with the yam, the vegetable foodstuff of primary significance, this digging stick has become as it were the prototype of all instruments of cultivation, the material symbol of agriculture. Like all other objects in this particular context it is regarded as the property, even the embodiment, of the Atua i Kaika, and therefore must be handled with extreme care, and only by persons authorised by the Ariki and at the appropriate time. No woman, for instance, would dare to touch it, nor is it probably ever seen by them. It is kept normally at the far end of the Kaika temple, and the custom is to hang a few kava leaves over it in token of its unique value and importance. As the implement decays it is replaced by a fresh one, but as its use is ritual, not practical, it lasts for many years without attention. The stick employed in 1928–9 was very frail, so much so that the Ariki, in handing it over to the man who was appointed to carry it, gave the caution “That one has become aged; go carefully lest you stumble in the path.” The bearer, out of deference to his sacred burden, had a clean white strip of bark-cloth wound as an extra cincture round his waist and a bundle of scented leaves stuck in the back of his girdle. The significance of these in ritual matters has already been

Soviet Union have been dissolved, and the newly emergent nations have tended toward agrarian reforms that favor peasant/household management. At the same time, the green revolution and related developments in agribusiness have made available to peasant/household production far more productive varieties of plants and animals, producing a “neo-technic” form of peasant agriculture integrating household management with large-scale organizations for economic and technical support that was formerly unavailable.

New World

In the New World one cereal crop stands out as far more important than all others: maize. The earliest known domesticated maize was found in a dry cave in the Tehuacan Valley of central Mexico and dates to about 5000 BCE. But it was far different from what the grain is now and far less productive and useful than the first domesticated Old World grains. Although clearly showing the hallmark of domestication—that the husk surrounded the entire ear and not the individual seeds—the ears were less than an inch long. Evidence of purposeful cultivation appeared about 1,500 years later in the same area, by which time maize was accompanied by beans, squash, chili, gourds, and amaranth. By 1500 BCE the Tehuacan maize was notably improved in both yield and nutritional quality, but even before then it had spread to other areas. Maize found in Bat Cave on the Colorado Plateau has been dated to about 2100 BCE. Small communities practicing irrigated agriculture appeared in the American Southwest by 300 BCE. Larger villages, or pueblos, with extensive canal systems and terraced fields
appear about 500 CE, including those of the Anasazi, whose descendants appear to include the modern Hopi and the Hohokam whose canals can still be seen in the city of Phoenix. In eastern North America domestication of local plants (marsh elder, sunflower, chenopods, and cucurbits) began about 1500 BCE. Maize appeared about 600 CE, but since rainfall there is generally adequate without irrigation it did not dramatically influence the size of population concentrations.

Generally, everywhere north of the Valley of Mexico agriculture was based on peasant/household production. On the basis of known historic patterns together with archaeological evidence, it can be stated that the key organizational units were household, clan, and village. Land ownership rested mainly with clans. Households farmed on the basis of clan rights. Clan rights were in turn supported by local consensus among councils of clan representatives. A village ceremonial hierarchy, staffed on the basis of clan prerogatives, controlled the annual cycle of activities, which included key agricultural dates.

The largest urban populations in the Mexican area were in the sites of original domestication, beginning with the Olmec civilization (1200 to about 400 BCE) and continuing through Teotihuacán, the Valley of Oaxaca, the Toltecs, the Chichimes, and the Aztecs. Although we know little about the Olmec organization, from Teotihuacán on it seems clear that in these states the relation between urban elite and the peasantry in the villages was not that between a populace and their specialized leaders and defenders but rather between conquerors and conquered, seemingly reflecting a takeover by a tribal group who converted themselves into a militaristic ruling class. The elites imposed heavy levies of produce, labor, and eventually sacrificial victims and concentrated on building enormous ceremonial centers representative of an ideology intended to perpetuate their rule. They engaged in large-scale manufacture and apparently long-distance trade. They did little, however, for those they subjugated. There was, for example, no really large irrigation system in the region, such as could not have been built by the local communities alone. There was also nothing that could be construed as state support for private commerce, such as harbor facilities, inns, or even coinage. In this area the populations of the principal ceremonial centers rose and fell with the power of the group that built them, rather than persisting through a succession of rulers. Teotihuacán, for example, had an estimated population of 200,000 in 500 CE but was abandoned forever around 750 CE, after a fire. The population of the villages, by contrast, seems to have built up fairly steadily.

The pattern in the northern Andes and the adjacent Pacific coast was similar. Beginning around 1200 BCE local communities practicing irrigated agriculture developed in river valleys in the mountains and on the coastal plains. Through local conflicts these built up into
a succession of progressively larger and more militaristic states: the Chavin, the contemporaneous Moche and Nazca, the Chimu, and finally the Inca, based in Cuzco, who established their dominance in the 1470s. The Inca demanded two-thirds of all production and large corvées of labor to build huge road systems, storage facilities, and extraordinary mountain cities with terraced fields that could not possibly have paid for themselves in economic terms. Manufacture of cloth goods and utilitarian and craft objects was organized and standardized on a large scale. When groups under pressure from the Inca fled to avoid conquest, the Inca sent colonists to replace them. When Pizarro arrived in 1532 and captured the ruler, the system collapsed.

The Mayan civilization of the Yucatán peninsula was different only in that the Mayan elite seem to have been indigenous, and they actually did perform functions crucial to productivity. Mayan civilization appeared essentially complete in the archaeological record about 2000 BCE and persisted continuously until the middle of the fourteenth century, when it collapsed in a series of civil wars and the areas were depopulated. The population centers were temple and palace complexes surrounded by many small hamlets and large areas of a type of chinampa technology.

When Europeans arrived Old World agriculture arrived with them, but the pattern differed in English-speaking and Spanish-speaking areas. In the former most of the management was peasant/household, and because Old World peasant agriculture supported far higher population densities than New World peasant agriculture, it completely displaced the latter wherever the two systems competed for land.

In the Spanish-speaking areas, by contrast, the main Old World management pattern was elite and the management system displaced was therefore its New World counterpart, leaving the peasant systems more or less as they were. The most extensive result was the “latifundia/minifundia” situation of large European-owned haciendas, mission estates, and other elite enterprises being laid over indigenous villages in which the villagers retained rights to carry on with their own subsistence agriculture but were also subject to demands to perform work for the larger unit.

Old World agricultural ecologies are now clearly dominant in the New World as well as the Old. Yet New World technology persists in a wide range of environmental niches that Old World agriculture has not been adapted to: the Hopi mesas with eight inches of annual rainfall, Mexican milpas whose owners rely on traditional maize as a low-cost subsistence base, the high Andes, and the Amazon rain forest.

**Industrial Agriculture**

Industrial agriculture responds to the higher levels of per-capita output permitted by the industrial revolution. Ecologically, it breaks up the animal–plant interdependence at the farm level by separating animal production facilities from crop production, providing manures from industrial sources, and requiring farmers to produce to industrial specifications rather than consumer preferences. Organizationally, it makes farm management part of the system of factory production, replacing inter- and intra-household relationships and elite prerogatives with relations based on commercial contracts between farmers and industrial organizations. At the extreme, in areas such as California’s Imperial Valley, farmers are not landowners of any kind. Corporations own much of the land, and farmers are contractors who agree to produce the desired crop for delivery at a specific time. The farmer may own a core of farm machines, will hire whatever additional inputs are needed to produce the crop, and then move on to the next contract.

Industrial agriculture is highly specialized. The on-farm population of the United States is now 2.5 percent of the total population, but it is supported by people in rural and urban areas engaged in agricultural finance, storage, primary processing, government, trade, transport, research, and education who make up not less than 20 percent of the total. When this entire group is taken as the unit for comparison from one society to another, it is easier to see how industrial agriculture arises and to avoid overstating the contrast between agrarian and industrial society.
Current Trends
The relative importance in the world agricultural economy of peasant/household and industrial production is now increasing while elite agriculture is in decline, but both modern peasant/household farming and industrial farming pose challenges. The green revolution’s reliance on increased chemical fertilizers and pesticides has led to serious water, air, and even oceanic pollution. The main hope for reducing such damage while still increasing yields rests with our increasing ability to modify plants by transferring genes from other species. However, several types of destructive business practices associated with the firms that have pioneered the commercial development of this technology have exposed serious deficiencies in the way current law addresses the interests of the great mass of agriculturists and agricultural stability. Efforts to correct them have been going forward very slowly.

Murray J. Leaf

See also Cereals; Horticultural Societies

Further Reading

AIDS

The appearance in Western medical literature in 1981 of a strange and inexplicable cluster of clinical manifestations—unusual opportunistic infections, cancers, and metabolic or neurological disorders—marked the emergence of what would become a global pandemic known as acquired immune deficiency syndrome, or AIDS. Efforts to find a cure for AIDS are in full swing at the beginning of the twenty-first century, but initial responses to the onset of the crisis were sluggish. Those responses have been determined by cultural attitudes toward disease (both epidemic and sexually transmitted) and by the socioeconomic disadvantages of the populations most closely associated with AIDS (homosexual males, male and female sex workers, drug users, and citizens of third-world countries).

History of the Epidemic
While epidemiologists who study the origins of disease rely in part on documentation such as medical and autopsy reports, and material evidence such as serum and tissue samples, tracing the history of a disease ultimately requires a certain amount of speculation. In the case of the virus that causes AIDS (human immunodeficiency virus or HIV, first isolated in 1984), a preponderance of evidence suggests it originated among monkeys in western Africa, moving from simian to human populations perhaps as early as the mid-twentieth century. From there it was rapidly transmitted from human to human by means of infected bodily fluids such as blood, semen, or vaginal secretions.

Increased travel between rural and urban Africa in the postcolonial period, as well as travel between Africa and Europe or the United States, helped spread the virus to the developed world. A number of aspects of modern society—including population mobility, relaxed sexual mores, intravenous drug use, and medical innovations like blood transfusion and organ transplantation—have facilitated the spread of HIV, which lives in the body for