

Chapter VI

GLOBAL PERSPECTIVE

Cattle are the scourge of the Earth.
--Richard Rice, The Wilderness Society

The American West is world famous for cows and cow-men, perhaps more so than any other region on Earth. However, livestock production in less celebrated forms has a profound influence across the globe. To put Western ranching in perspective, to learn how it is interrelated with world livestock production, let's take a quick (and necessarily simplified) global livestock tour, starting with our overgrazed neighbor to the south:

Mexico is an incredible topographic labyrinth and includes everything from scorching deserts to pine-clad highlands to steamy jungles. The country shelters more than half of all migrating bird species in North America. It harbors the Earth's greatest array of reptile species and ranks second only to Indonesia in mammal species.



Cattle in the state of Sonora, Mexico. The new fence in the foreground is part of an intensified ranching development effort that includes devegetating and seeding millions of acres of lush aboriginal Sonoran desert and grassland.



A nearby area of Sonora not yet developed for ranching.

Unfortunately, Mexico is also one of the most degraded and threatened regions on Earth. With 90 million humans and 40 million cattle in only 1/5 the area of the US, it is overpopulated throughout. More than half of the country in nearly every landscape is grazed by livestock, and most of this land is plagued with overgrazing and ranching abuse. Many areas have been stripped of vegetative groundcover to bare dirt, and officials list accelerated soil erosion as one of Mexico's worst problems.

More than 60% of Mexico's original rainforest has been destroyed, largely to create cattle pastures, while overgrazing and brush and tree removal by ranchers keep it from growing back. Millions of acres of temperate and semi-arid tree and brush cover have likewise been eradicated. Predators such as jaguar, mountain lion, Mexican wolf, and bears have been eliminated from the vast bulk of their range, along with most other wildlife. To hint at the extent of ranching's environmental impact: Stockmen in Mexico and other tropical countries search out and kill millions of vampire bats in their roosts because the bats feed on cattle.

Due to human overpopulation, widespread poverty, and intensive competition for land, private land in Mexico has little protection from ranching. Due to these factors and general, institutionalized political corruption, Mexico's public land is likewise degraded. Additionally, more of Mexico's grain is fed to livestock than is eaten by people.

The [Mexican] jungle is burning, the great trees are being destroyed and the land is enveloped in a sinister darkness. No-one cares, people only seem to be thinking about the cattle.
--Gertrude Duby Blom, "The Jungle Is Burning," *Advance* magazine

To the east, in the **Caribbean Islands**, 1/4 to 1/2 of the land base of most islands has been deforested and converted to cattle pasture, with similarly tragic results. On **Espaniola**, where in 1493 Columbus introduced cattle, sheep, pigs, goats, and horses, only 9% of the forest that once covered nearly all of the island remains; much of the island continues to be overgrazed by cattle and goats. Cattle density in **Cuba** is among the highest on Earth, and much of the land is cattle pasture.

Throughout Central America, cattle grazing produces fewer benefits per unit of land deforested than any other form of land use. In Costa Rica, for example, the livestock cattle industry produces only \$42 per square kilometer in export revenues, while the banana industry produces \$6,036 on the same amount of land.

--Rainforest Action Network

The 7 nations comprising **Central America** cover only a tiny portion of the planet's surface, yet rank high in numbers

of plant and animal species. **Costa Rican** cloud forest may support more species per unit of area than any place on Earth. A century ago, most of Central America was blanketed with luxuriant tropical rainforest, while the remainder was covered with drier tropical forest and mountain vegetation.

Today, fully half of Central America is cattle pasture, and about 2/3 of the region's arable land is dedicated to cattle production. Since 1960, over 40% of Central America's rainforest has been cut and converted to cow fields. Soil erosion and flooding are rampant.

As in most areas of the world where domestic livestock are grazed, Central American ranching is monopolized by a small number of powerful, wealthy ranching families. Also as in much of the world, these dominant land barons are a main cause of the region's long-standing social and political injustice. Contrary to popular opinion, they export only about 1/4 of Central America's beef, largely to the USA, where most of it ends up as fast-food hamburgers, lunch meat, hot dogs, and other processed meat. Most is eaten by Central America's urban elite.

In 1975 a United States reconnaissance satellite's heat sensor detected a sudden and intense warming of the Earth in the Amazon basin usually associated with an imminent volcanic eruption. A special alert mission was dispatched. And what did they find? A German multinational corporation burning down one million acres of tropical forest for a cattle ranch.

--Frances Moore Lappe, **Food First** (Lappe 1979)

Moving into **South America** we find an ongoing livestock catastrophe that dwarfs Central America's in total area. The **Amazon Basin** contains by far the Earth's largest contiguous rainforest. In what has been called "the biggest holocaust in the history of life," roughly 1/3 of the Amazon Basin's original rainforest has already been destroyed -- beginning when Europeans arrived in the 1500s, but occurring mostly in the past 2 decades. Satellite photos show about 31,000 square miles -- an area the size of Maine -- of Brazilian rainforest being cleared annually. **An estimated more than 70% of Amazon deforestation is for cattle ranching**, though ranching is sometimes used as a cover for other types of exploitation. Currently, there are more than 50,000 separate livestock operations in Amazonia.

Typically, prospective ranchers chainsaw, bulldoze, or chain all trees in large blocks of forest, allow the slash to dry, and then burn it. (Satellites have detected as many as 7000 fires burning in the Amazon in one day.) Soon thereafter, grass, forbs, shrubs, and small trees colonize the burned areas and the cattle are brought in. According to the Rainforest Action Network:

Unfortunately (or perhaps fortunately), these "instant cow pastures" don't last more than a few years. The nutrient-poor topsoil is soon depleted, and the land degrades from lush jungle to scraggly desert. Then the cattlemen move on to the next forest.

Recent evidence indicates that these ravaged areas are somewhat more resilient than at first thought. However, they are rarely allowed to recover, and are usually grazed until no longer able to support cattle, commonly a decade or two. When finally abandoned, they are beyond the point of recovering to anywhere near their original condition.

As part of an intensive national development program begun in the early 1970s, the Brazilian government (like the US) spent billions of tax dollars to encourage cattle production in the Amazon, offering free or cheap land, little or no taxes, and other assistance. According to a *Nature* TV documentary, "Rainforest ranchers stay in business only because of government subsidies." As with US public lands, Amazon destruction has little justification; only 3%-4% of Brazilian beef is produced there.

And as with "Indians" in the USA's Old West, thousands of indigenous Amazonians are being displaced by ranching and killed by introduced disease and alcohol. Many native resistors have been murdered outright by wealthy rancher "god-fathers" and their hired "pistoleros," as was recently Chico Mendez, the highly respected rainforest defender. Those local inhabitants who depend on sustainable forest products, such as rubber and Brazil nuts, likewise are victims of this relentless ranching onslaught (Amazonian Manifest Destiny?).

The planet's most species-diverse bioregion is quickly being devastated. At the present rate of deforestation, the Amazon rainforest will be all but gone within several decades.

I am a rancher, and I will live like a rancher, even if the ecologist doesn't agree. . . . We ranchers are the biggest ecologists!

--Daryl Alves, powerful Amazonian stockman whose son recently admitted to having hired a professional killer to murder Chico Mendez, TV series *The Reporters*, 11-18-89

Even though a world-wide outcry today could conceivably save much of the Amazon, livestock production has already extensively damaged most of the remaining 2/3 of South America. Most of **eastern and southern Brazil, Uruguay, and Argentina** -- an area larger than the Amazon -- is heavily overgrazed and damaged by ranching developments. Here are more than 150 million cattle, perhaps 80 million sheep, and the world's most extensive intensive ranching area. This is where "gauchos" are the celebrated equivalent of US Western cow-boys. Most native animals, including the strange, humpless camels that grazed the plains when the Portuguese and Spanish arrived with their livestock 400 years ago, are gone, and surviving vegetation bears little resemblance to aboriginal grassland, semi-grassland, or other vegetation types. On the Argentine *Pampa*, for example, less than 1/4 of the remaining vegetation is native.

To increase forage, stockmen also have destroyed much of the region's original deciduous to semi-deciduous forest and scrub. Brazil's southern and eastern states, which encompasses more than half of the country, have lost more than 95% of their original Atlantic tropical forest cover, more to ranching than any other factor. Corn is the region's major crop, but roughly 1/3 of the corn is fed to livestock, along with major portions of its wheat, soybeans, and other crops.

In the northern portion of the continent, about half of both **Colombia and Venezuela** -- mostly the vast *llanos*, or plains -- are now dedicated primarily to 35 million cattle. Much tree and brush cover likewise has been cleared here to promote forage, and for cropland -- about 1 million acres

per year in Colombia alone, where 25% of all land is said to have "serious" soil erosion problems. Predators and competing herbivores have been eliminated, along with most native wildlife.

Sheep, alpaca, goat, and cattle grazing is prevalent throughout most of the 6000-mile-long **Andes Mountains**, from the Caribbean shore to Tierra del Fuego. The UN identifies this region as one of the world's most threatened by pastoralism. The arid to semi-arid high plains and valleys, and some of the drier lowlands, are especially vulnerable to livestock damage, and much has been divested of nearly all plantlife. Native Andean camels -- llamas, vicunas, and guanacos -- once roamed the grassy high plateaus by the tens of millions, but livestock grazing has so ruined their habitat and sheep and goat ranchers and herders slaughtered so many of them as competitors that, despite recent recoveries, the llama and guanaco remain at only small fractions of their aboriginal numbers; the vicuna was listed as Endangered in 1969 before making its modest recovery under special protection. (All 3 are now semi-domesticated in most areas.) As with the California condor, two of the biggest threats to the Andean condor -- of which only about 1500 remain -- are livestock grazing and shooting and poisoning by stock raisers, who are likewise the main killers of other large predators and smaller competitors in most of the Andes.

Portions of the drier lowlands and west coast are also overgrazed, as is about half of **Bolivia**, from mountaintops down to rainforest. The US Embassy in Bolivia reports forest cover being removed at roughly 3/4 million acres per year, largely for livestock, and that overgrazing is changing river flows, stripping topsoil, and desertifying the land: "On the *Altiplano* [high plains], grazing animals remove virtually all plantlife."

Off southern Argentina in the Atlantic, Great Britain's **Falkland Islands** are little more than an overgrazed 6000-square-mile sheep ranch.

Out in the vast Pacific, many oceanic islands once covered with lush vegetation have been devegetated by or for goats, sheep, cattle, and/or feral pigs and goats. For example, **Easter Island** (famous for its huge, mysterious monoliths), now desertlike throughout, is thought to have once been mostly tree covered. Whether the forests were originally cut more for wood or to promote livestock grazing is uncertain, but livestock subsequently prevented them from growing back by eating saplings. **St. Helena**, in the South Atlantic, met a similar fate. In the South Pacific, more than half of 300-mile-long **New Caledonia** and about 1/3 of the 7000-square-mile **Fiji Islands** have been cleared and turned into pasture.

Small islands are particularly susceptible to livestock damage because they usually contain relatively simple ecosystems with fewer natural limiting factors (large predators, diseases, etc.) and lack adjacent terrestrial ecosystems to buffer impacts, allow wildlife to escape to, reintroduce extirpated species, etc. Ranching and feral livestock have upset the ecological balance on hundreds of small islands around the world. For example, goats introduced to Baja California's **San Benito Islands** and California's **San Clemente Island** multiplied without restraint and quickly transformed these botanical wonderlands into wastelands.

Back in the South Pacific, we move on to **New Zealand**, world-renowned for its sheep. With about 100,000 square miles, 80 million sheep, and 8 million cattle, New Zealand has the world's highest livestock density -- equivalent to about 1200 sheep per square mile. Much of the island nation is steep, rugged, densely forested, or otherwise unproductive for livestock, so density in areas actually grazed approaches 2000 sheep per square mile!

Were New Zealand not well-watered and lushly vegetated, it could not support even a fraction of these animals. However, environmental damage here can only be described as extreme. About half of the country now resembles an immense golf course covered chiefly with exotic vegetation. Forests that once blanketed most of the islands have been reduced to 5% of their original coverage. In large portions of the North Island "slips" -- or huge sections of topsoil -- are sliding off the overgrazed hills. In the worst areas, former subtropical and temperate forest is now virtual desert. Most of New Zealand's unique animal life is gone, and some species are extinct or in danger of extinction, due largely to livestock grazing and ranching practices. On this biologically isolated island realm -- where bats are the only native mammals -- the impact of nearly 100 million large, hooved quadrupeds is understandably profound.

New Zealand's big neighbor to the northwest, **Australia**, is grazed by twice as many sheep -- 160 million, or a population 8 times greater than the continent's human population. By far most of these are raised in the interior eastern third, while some are grazed on the far western grasslands and Mediterranean scrub. The island continent is also home to some 30 million cattle, most being raised along the relatively moist eastern coast. However, most of the remainder of Australia is also grazed by cattle and sheep; generally, livestock density decreases toward the arid, barren heart of the continent. Altogether more than 2 million of Australia's 3 million square miles are grazed. Ranching is impossible on most of the remainder because large portions of the interior are too dry and barren (partly as a result of past overgrazing), and some of the northern tropical forest is too dense.

Of all land uses ranching easily causes Australia's greatest environmental damage. The huge land mass drifted away to form "the island continent" more than 100 million years ago, before the evolution of large ungulates on the contiguous continents, so Australia never felt a hard hoof until 200 years ago when Europeans arrived with their cattle and sheep. In other words, the Australian environment did not evolve to include *any* hooved animals, much less domestic livestock.

Overgrazing has reduced or extirpated native vegetation throughout much of the continent and replaced it with more than 800 species of exotic "weeds," and bare dirt. About 3300 native plants are now considered rare or endangered, and more than 100 are extinct largely as a result. Cryptogamic crusts have disappeared in many areas. Soil erosion has increased tremendously; consequently, huge dust storms sometimes roll out of the overgrazed interior and over coastal cities. Natural water sources are greatly diminished, and soil salinity continues to rise. Cattle dung produces billions of troublesome bush flies. Sheep and cattle have eaten and trampled many small mammals and others out of

food and shelter. So far, 18 of Australia's mammals are extinct and 40 are endangered, due more to ranching than any other factor.

Extreme overgrazing, especially by sheep, promotes massive grasshopper "invasions" and incredible population explosions of feral European hares. The exotic hare is now the most populous mammal in Australia, eating approximately 1/12 as much as the nation's livestock. Also helping to lay waste to the continent are many feral ungulates, spread largely by ranching -- an estimated 300,000 horses, 1.5 million burros, 570,000 cattle, 7 million pigs, 150,000 water buffalo, and 35,000 camels.

In their attempt to maximize production, Australian stockmen have degraded the land perhaps as much as their livestock. Ranching "improvements," including roads, are the most visible and harmful developments throughout most of the Australian outback. Millions of acres of brush, eucalyptus and other trees around the continent have been cut, chained, bulldozed, burned, herbicided, etc. for livestock; largely for this reason, less than half of Australia's aboriginal tree cover remains. Millions of acres of forestland in the north currently are being cleared for cattle and water buffalo. Denudation of woody vegetation, along with slaughter by ranchers and a drastic reduction of grass from overgrazing, has caused many of the smaller of the 62 species of Australian kangaroos to become endangered or extinct. Each year an estimated 3 million large kangaroos (and many other herbivores) are killed legally, plus an equal number illegally, mostly by or for ranchers to reduce grazing competition. Wallabies and pademelons once roamed the grasslands of Australia; today, due to overgrazing and attrition from ranchers, few survive but on offshore islands. Australia's primary large predator, the coyote-like dingo, is considered vermin and killed by the thousands annually. Ranchers slaughter millions of competing feral hares, but to help kill off the rodents they introduced European red foxes, stoats, and domestic cats, which now number in the millions and kill off burrowing marsupials and other natives as well.

The Australian ranching establishment is strikingly similar to that of the US West. The government leases grazing to a handful of powerful, wealthy stockmen, who essentially control about half of Australia with ranches of tens or hundreds of thousands of acres each. They pay only token grazing fees and are heavily subsidized by numerous direct and obscure means. Yet, they commonly represent themselves to the public as poor, dusty, downtrodden stock-folks; Crocodiel Dundees; or John Waynes.

As in the USA's Old West and now in Brazil's Amazon, the native peoples, here the Aborigines, are being forced from their homeland and into poverty, disease, and alcoholism, while their land -- their source of food, water, and other necessities -- is ravaged by overgrazing and range development. According to a recent *National Geographic* article, "Whites came in and killed any game they wanted, but when an Aborigine speared a sheep or calf he was an outlaw."

Australia is said to hold the world's record for environmental destruction relative to the size of human population -- 11 acres of land significantly damaged per human inhabitant. Livestock production is by far the main factor giving it this dubious distinction.

Moving north, to the equatorial west Pacific region, we find as yet relatively little livestock production, except sheep pasture on **Sumatra** and cattle pasture on **Java**, a large island with one of the world's highest concentrations of humans. Partly as a result, soil erosion, siltation, and flooding are serious on these 2 islands. However, the **Indonesian region** is the wettest large area on the planet, and though logging is increasing dramatically in some areas, most of the region is still covered with dense rainforest, on **Borneo** and **New Guinea** in particular. Unfortunately, to reduce population pressure on some islands, the Indonesian government is encouraging expanded settlement, including clearing of rainforest for livestock. An estimated 1 million acres of the island country are deforested annually.

The Philippines a few centuries ago was covered with one of the most prolific rainforests on Earth. Today, little rainforest remains and more than 1/3 the area of The Philippines is cattle pasture. Remaining rainforest is falling faster than almost anywhere else in the tropics, mostly for timber, but as elsewhere around the globe livestock and their owners prevent reforestation in many areas.

Japan also has several million cattle. Much of the land in its southern islands is dedicated to pasture.

Commercial livestock production on mainland **Southeast Asia** is limited mostly to **Thailand** and **Burma**, where much of the fertile lowland is used to produce about 20 million cattle. Still, livestock raising is spreading in the region where forests are cut, and the animals eat and trample young trees and prevent reforestation. Forest covered 80% of Thailand only 40 years ago; today, the 20% remaining is quickly being destroyed. When forested areas cleared for farming lose productivity, often they are converted to livestock production rather than being allowed to reforest. Also, over 2 million acres of former Thai forest now grow cassava, a fruit exported to feed European cattle. Water buffalo are raised as work animals throughout much of Southeast Asia, but they do much less harm than commercial livestock production.

There are nearly 1.5 million square kilometres of desert in China [16% of the nation] including the Gobi Desert. . . . It is estimated that 1000 square kilometres are lost to desertification in China each year and that 85 per cent of the desert area of the country was caused in the first place by overgrazing, deforestation and excessive cultivation.

--from *China Reconstructs* (Vol. 36[2], Feb 1987)

China ranks second both in world sheep and goat production. More than 120 million of the woolly animals graze nearly every portion of the US-sized country, while tens of millions of goats browse and graze generally the more rugged portions. The heaviest concentrations of both are in the north-central region and northern Manchuria, where accelerated soil erosion is nearly universal, plant cover is severely depleted, and nearly all large native animals are gone. The Chinese government recently implemented a massive grass and tree planting program to stem desertification in the north, but most of the grass dies and only about 10% of the trees reach maturity; livestock often eat the new grasses and tree saplings. Chinese scientist Zhu Zhenda reports in *Beijing Review* that "unless urgent measures are taken" desertification in China will consume

an additional 200,000 square miles -- more than twice the size of Taiwan -- by the year 2000.

Most of west China is dry, and 2/3 of the region is utilized by nomadic sheep and goat herders; damage here is considerable. In the southwest, before the invasion of Mao's People's Liberation Army in 1950, Tibet had one of the most successful systems of environmental protection of any peopled region on Earth; Tibetan Buddhism extolled compassion for all life and forbade killing animals. The new regime, however, established collective farms and widespread intensive livestock grazing. Predators and competing animals, even moles and marmots, were slaughtered. Livestock numbers have risen 10-fold in many areas, and where large numbers of antelope, gazelles, musk deer, wild sheep and asses, wolves, foxes, leopards, and bear once roamed, huge herds of domestic sheep and yaks now graze. Recent expeditions through the region report denuded ranges, serious soil erosion, and virtually no wildlife. According to the UN, the Himalayan region is one of the most endangered ecosystems on Earth, largely from livestock production.

East China, where nearly a billion humans live, is mostly highly developed farmland. Nearly all of the nation's 60 million cattle are grazed on pasture and cropland there; altogether, about 1/3 of eastern China is grazed. However, pigs are China's primary meat animal (although most Chinese eat little meat), and more than 300 million are raised -- 40% of the world total and 5 times more than any other country. Relative to the amount of meat produced, Chinese pig production is much more efficient and less environmentally harmful than is cattle, sheep, and goat production.

North of China is **Mongolia**, an Alaska-sized, sparsely populated, semi-independent Soviet territory. Nomadic herding here is nearly omnipresent, and most of this cold, dry, barren land (original home of the tumbleweed) has been extensively damaged by livestock grazing. Recent research on the steppes of Inner Mongolia reveal a desertification rate among the highest on Earth.

Nearly half of the immense **Soviet Union** is cold northern forest, so livestock grazing in this nation is confined mostly to the southern and western regions -- still an area larger than the US. Here are broken woodlands, vast grassy steppes, extensive marshes, expansive deserts, 125 million cattle, and 160 million sheep. Globally, the USSR ranks first in number of sheep and second behind only India in number of cattle. About half of the mid-section and nearly all of the southern portion of the country are ranches or farmed for livestock, with a heavy environmental impact. For example, the saiga, a strange goat-like animal with short, straight horns and a large, thick snout, roamed mid-Asia by the tens of millions before being driven nearly to extinction by livestock production and overhunting. Now propagated as a stock animal, the semi-domesticated saiga population is about 1 million.

Large portions of central Asian USSR have been turned dry and barren by decades of overgrazing. Massive grass- and tree-planting restoration efforts here try to stem the tide. However, the cattle population increase in the USSR and **eastern Europe** in the second half of this century has been the highest of any region on Earth, as more and more grain is fed to livestock instead of people, more land is

devoted to grazing, and rangeland is more heavily developed and stocked.

Scattered across the northern Soviet Union, semi-nomadic herders raise semi-domesticated reindeer across nearly 4000 linear miles of Arctic tundra and boreal forest. Modern breeding and handling practices and overstocking cause overgrazing in many areas, while related predator kills, developments, and human encroachment also damage these fragile Arctic to sub-Arctic ecosystems.



An Indian with a decorated sacred cow. (BLM)

India probably is the most overgrazed large country. With nearly 200 million cattle (15% of the world total), 50 million sheep, 17% of the world's goats, and other livestock competing with more than 800 million humans in an area only a little larger than the contiguous 11 western US states, the situation is critical. Though most of the Indian subcontinent is well-watered with monsoon rains and is naturally one of the most productive regions on Earth for humans and wildlife, livestock have rendered much of the country desertlike -- what is termed a "wet desert." Even the Great Thar Desert in northwest India does not have a truly arid climate, but has been turned into barren waste mostly by livestock.

Livestock are nearly everywhere in India, and Hindu "sacred cows" wander freely, multiplying unchecked, eating and trampling the already overburdened environment. Throughout most of India, native wildlife has disappeared; soil erosion is severe; water tables are dropping; streams are being converted from year-long to seasonal flow; rivers flow with sediment; silt clogs reservoirs and irrigation canals; and flooding is increasing. Overgrazing and deforestation in the Himalayan watershed cause landslides, fill reservoirs with silt, lower water tables, and flood the Ganges Plain. Where once elephant, rhino, buffalo, gaur, lion, tiger, leopard, 8 species of deer and antelope, and many primates roamed in great numbers, extinction, near-extinction, and scarcity are now the rule. For example, cattle and domestic buffalo are currently destroying the last tiny remnant of habitat of the endangered Asiatic lion. In southern India, cattle compete with and spread diseases to the last significant herds of wild Indian elephants, which also are killed as competitors by stock owners.

Little of India's original forest remains and what does is "intensely" overgrazed, according to government officials. Of the remaining 185 million acres of original forest (22%

of the country), 75 million lack tree cover and 25 million have only shrubs. Worse, satellite data show a loss of more than 3 million acres of Indian forest annually. Stock owners often fell whole trees to provide fodder to their hungry animals; saplings are eaten as soon as they sprout. Consequently, as do people in much of Asia, Africa, and Latin America, many Indians burn dry livestock dung for fuel -- at the further expense of the soil. But even dung is becoming scarce. In some areas people follow cattle around and compete for the plops as soon as they leave the animals' bodies; the winners dry their bounty in the sun.

Throughout most of India, cattle eat most edible plant material within reach. In some areas there is nothing left to eat, and their bloated bodies are seen being eaten by vultures or floating in the rivers, augmenting the manure, sediment, chemical, and sewage pollution. During droughts, they die by the hundreds of thousands. While people lie in the dust starving, children climb high into remaining trees to pull off leaves and twigs so cattle will not starve. In recent years, local governments have established fodder relief camps for starving cattle, much as they have food relief camps for starving people. India has extreme overpopulations of both humans and livestock; the populations of both have doubled since 1950.

The Great Thar Desert turns truly arid in neighboring **Pakistan**, where the huge southern Indus River Valley region receives only 4"-8" of precipitation annually. Scientific evidence indicates that several thousand years ago this region was covered with jungle -- even away from waterways -- and that livestock production has not only denuded vegetation but helped aridify the climate.

Moving west from Pakistan through the **Middle East** to **Turkey**, we find a rugged assortment of arid to semi-arid terrain, much of it mountainous. Nomadic herders (generally in the east) and livestock farmers (generally in the west) raise about 150 million sheep and uncounted millions of goats here on short grass, brush, small trees, and pasture. Turkey holds about a third of these animals, along with about 15 million cattle. From centuries of intensive pastoralism, most of the region is badly deteriorated.

Much of the "Holy Lands" of **Syria, Iraq, Lebanon, Israel, Jordan**, and the **Sinai Peninsula** once supported abundant grass and other vegetation, as well as wild animals. Millennia of overgrazing transformed most of the region into scenes of desolation. In *Conquest of the Land through 7,000 Years*, W.C. Lowdermilk relates how historic goat and sheep grazing "unleashed the forces of erosion" that "devastated" many areas. He describes how the forests that once covered much of Lebanon -- including the fabled "Cedars of Lebanon" -- were destroyed for building materials and, because livestock ate all small trees, never reestablished themselves, *except as 4 tiny groves protected by stone fences* from "the rapacious goats that graze down every accessible living plant on these mountains." (Lowdermilk 1975)

Large portions of the huge **Arabian Peninsula** are too dry, sandy, and barren for livestock, but evidence indicates that millennia of pastoralism is a contributor to this condition. Desertification appears to have progressed here for at least several centuries, but recently it has accelerated. Today, nomadic herders run domestic camels (a relatively less destructive trampler, though a more wide-spectrum eater), sheep, goats, and some cattle wherever they still can

-- on most of the subcontinent, especially the relatively moist southern highlands.

The Middle East generally has been overgrazed perhaps longer than any region on Earth; thus, desertification there has progressed to the point that little original soil, water, or wildlife remains. Contemporary grazing on about 3/4 of the region keeps it in a highly degraded condition.

We cross the Red Sea into **Africa**. Half of the world's livestock-dependent people live here, along with 15% of both the world's sheep and cattle and nearly 1/3 of all goats -- animals renowned for their ability to eat almost any plant (some kinds of goats can even *climb trees* to reach browse).

Africa's 183 million cattle, 197 million sheep, and 163 million goats are supported almost entirely by grazing and browsing. Most of the huge continent is used by livestock. Non-livestock Africa consists mostly of desolate portions of the Sahara, Namib, and Kalahari Deserts; what remains of the dense, central African tropical rainforest; the tsetse fly portions; scattered farming areas; and the few (partially) protected wildlife preserves. The image of Africa as a gigantic, unfenced wildlife landscape is wholly false. In fact, much more land is dedicated to livestock, and by far most wildlife is gone.

However, the infamous tsetse fly continues to spread deadly sleeping sickness to cattle, though not to wildlife. Large portions of central and southern Africa support some of the world's largest surviving wildlife populations in a comparatively healthy environment, mostly because humans have been unable to eradicate the tsetse fly to make way for cattle (or, in many areas, to *reinstate* cattle). For more than a decade, the United Nations' Food and Agricultural Organization (FAO) has waged a multi-billion dollar pesticide campaign to eliminate the tsetse fly over 70% of its African habitat -- about 10 million square kilometers, an area larger than the United States. The FAO's stated reason for the "war" on the tsetse is to open up potential rangeland (largely cut-over forest and woodland) so that *120 million* cattle may be raised there. These cattle would eat small trees and prevent regrowth of forest and woodland, increase soil erosion, compete with wildlife, transmit disease, etc.; the incoming ranchers would build fences and roads, kill predators, cut more trees, and so on. Thankfully, even though 200,000 tons of deadly active ingredient in insecticide has rained down on the tsetse areas, FAO has thus far been ineffective in most areas. Unfortunately, the FAO program is scheduled to continue another 30 years or more, and now the European Economic Community is pushing a plan to eradicate the fly and develop the tsetse area for ranching. (As for the tsetse's alleged deadly threat to humans, only 5 deaths have been recorded in 25 years.) [To protest FAO's war on the tsetse, write: FAO, United Nations, Via delle Terme di Caracalla, 00100, Rome, Italy.]

More surely than the bark of a gun, the lowing of cattle and bleating of goats sound trouble for wildlife. . . . Many in the wildlife community mourn the loss of the insect that, for its role in keeping out livestock and settlement, has been called "the best game warden in Africa." While I rode with one hunter, he rolled down his window and carefully shooed out a fly with the admonition, "Go and breed, you little bugger."

--Douglas B. Lee, "Okavango Delta," *National Geographic* (Dec 1990)

Aside from the tsetse areas, ranching and nomadic herding are common south of Africa's central rainforest, large areas of which have been cleared for livestock. Recent studies show mounting range deterioration throughout southern Africa. In the **Kalahari region**, cattle and range developments have ruined much of the grassland and semi-grassland, leading to the deaths of millions of antelope and other wild animals. In the late 1970s in the Kalahari, drought-stricken migrating wildebeests piled up against new cattle fences; 200,000 out of 230,000 migrants died of thirst because they couldn't reach water. Ranching and herding have also ravaged the land of, plundered the livelihood of, and made virtual slaves of thousands of Bushmen -- the tribespeople who had gathered and hunted here for more than 10,000 years. Many now live in shanties and tend cattle for their stockmen bosses.

A 1984 United Nations report states, "The degradation of rangelands caused by overgrazing is doubtless the most serious environmental problem facing **Botswana**." The nation's cattle outnumber people 2 to 1, and are a traditional measure of wealth. Much of the land is stripped bare, and during droughts starving goats climb atop cars to reach withered leaves and onto roofs to eat thatch. Having killed the tsetse with herbicides, ranchers are invading Botswana's last remaining wetlands. Thousands of miles of fences built to exclude wildebeests, zebra, antelope, water buffalo, elephants, and other wild animals thought to carry livestock diseases kill tens of thousands of these wild animals yearly; for example, more than 50,000 wildebeests died in 1983 alone. Like many others, the Botswanan government is dedicated to serving big-time ranchers, and many high government officials are themselves cattle barons.

Sheep ranching is intensive in **South Africa** and northwest in neighboring **Namibia**, though not elsewhere in southern Africa. Forty million of the fleecy beasts overgraze millions of acres of the scraggly brush and surviving grass there. In southeast Africa the populous Zulu tribe has evolved to regard cattle as indicative of wealth and status -- to the great harm of the environment.

Several hundred miles off Africa's southeast coast lies the island country of **Madagascar**, home to some of Earth's most unusual and varied wildlife. About 200,000 plant and animal species are native there, more than half of them endemic. When humans and their livestock first arrived in this 227,000-square-mile paradise only 1500 years ago, 4/5 was mantled with luxuriant tropical forest and lush savanna. Today, 60% of the forest has been cut or burned, largely to increase forage for cattle and goats, and, along with most of the former savanna, lies barren due to relentless overgrazing. *Thousands* of plant and animal species are already extinct, and grazing pressure continues to mount. The World Wildlife Federation identifies Madagascar as one of the world's 3 leading areas experiencing decline in biodiversity due to human influence.

Back on the mainland, moving north through eastern Africa, we find that large portions of the south have relatively few livestock, thanks to the tsetse fly and other deterrents. From central Tanzania northward through Ethiopia, however, cattle, sheep, and goat damage is moderate to severe. Portions of the coastal lowlands are overgrazed, and some of the dominant nomadic herders here *kill* anyone venturing onto their grazing territories. The 100,000-

square-mile **Afar Triangle**, just west of where the Red Sea meets the Gulf of Aden, contains some of the lowest, hottest, driest, and most desolate land on Earth; yet, even here herders allow their goats, sheep, and camels to take what scant vegetation and fresh water still exists.

In the livestock-ravaged highlands, human starvation is periodic, as recently demonstrated once again in **Ethiopia**. Livestock plague the region's arable lands and make them more susceptible to drought and other natural vagaries in climate, frequently even eating crops. Bare dirt is spreading as stock raisers topple trees for fodder and livestock eat saplings and groundcover. The Masai, one of the region's large, nomadic herding tribes, has over the centuries become so over-specialized and dependent upon livestock that they sometimes allow their animals every last available leaf and drop of water in an area rather than risk losing their source of milk, blood (they drink it), and meat. Masai populations have tripled over the past 30 years; their livestock numbers have also soared and grazing pressure mounts.

The Ethiopian highlands were once among the most biologically diverse non-tropical forestlands on Earth; now they are among the most damaged. The rate of deforestation here is one of the highest anywhere, and only 3% of Ethiopia's original forest remains. Herders currently are driving livestock into the few remaining rugged areas not yet overgrazed. Recent reports from Ethiopia's northern mountains tell of the forest understory in previously ungrazed areas being stripped of every edible leaf and twig.

In northern **Kenya**, Lake Turkana (formerly Lake Rudolf), one of Africa's largest lakes, has shrunk dramatically in recent years. Many people think overgrazing of the vast Turkana Basin is the main cause. In southern Kenya, deforestation of mid-altitude brushland and upland forest to improve livestock pasture is occurring "at an alarming rate," according to the UN.

Not far south, in northern **Tanzania**, lies Africa's largest caldera, a 12-mile diameter, steep-walled crater named Ngorongoro. Mostly livestock-free since 1974, and protected from encroaching ranching, farming, and poaching, the grass-, shrub-, and tree-filled Ngorongoro is now one of the planet's greatest game preserves.

The vast belt of steppe and grassland from the Ethiopian highlands 3500 miles west to the Atlantic, from the Sahara 1000 miles south to the rainforest -- sometimes termed **the Sahel** -- is also a land of cattle, sheep, goats, and famine. Here, periodically, many thousands die from starvation; the emaciated people often are pictured lying in the dust beside their skeletal cattle -- *the cattle that symbolize their wealth and prestige!* As throughout much of the world, social inequities are largely to blame for the famines; however, contemporary livestock production is a major cause of these inequities, as well as an inefficient and destructive food production system. The Worldwatch Institute, a Washington, DC-based environmental think tank, states that "virtually all the rangeland [in this region] is "at least moderately degraded." According to ecologist Paul Ehrlich, "In the Sahel, the territory just south of the Sahara, and in Africa in general, cattle are playing a major role in this desertification" (Ehrlich 1986). The Sahel livestock population *quadrupled* between World War II and 1968, and remains many times higher than the land can accommodate.

Livestock grazing throughout the vast bulk of this region has turned thousands of square miles into wasteland, and continues to do so at an ever-accelerating rate. For example, **Mauritania** recorded only 43 sandstorms between 1960 and 1970, but 10 times this number in the following decade, with a record 240 sandstorms in 1983 alone. Officials here and throughout drier Africa report a main cause of devegetation and land degradation is herders breaking branches from the already small tree population to feed livestock, and cutting woody vegetation to build livestock enclosures. In **The Sudan**, about 30% of which has been seriously desertified during the past 50 years, thousands of square miles of forest are burned annually to increase livestock forage. And Lake Chad, the largest natural lake in northern Africa and one of the largest closed river basins in the world, has shrunk to merely 20% of its size only a few decades ago, mostly due to livestock-caused desertification and livestock production practices.

According to various sources, the **Sahara Desert** (or rather, desert-like condition) is expanding southward at a fluctuating, rough average of 2-6 miles per year, with livestock production the principal cause.

There were those who even claimed that the huge Sahara Desert was a man-made product caused by shepherds burning the jungle, and by the subsequent overgrazing of ever larger herds of goats and sheep. Modern research has proved this to be so.

--Thor Heyerdahl, **Fatu-Hiva**

Recent research has demonstrated that the Sahara was covered with trees as recently as 6,000 B.C., and that it was turned into a desert by nomadic tribes that burned the trees to provide grazing areas for their herds.

--Jacques Cousteau, **The Ocean World**

Only 6000 years ago the Sahara Desert was largely covered with trees, brush, and grass, and has since become arid. Much evidence also indicates that, as is the case in many of the world's drylands, livestock grazing was a significant contributor to this aridification. Contemporary livestock herding over more than 2/3 of the USA-sized, sandy, barren wasteland we now call the Sahara Desert continues to deplete what scant soil, vegetation, and water sources remain. Stock raising is carried on wherever possible with little regard for sustained yield or environmental consequences. However, livestock ownership here is less a matter of survival than tradition, honor, and glory.

The region all along the northern coast of Africa and south for many miles into the interiors of **Tunisia**, **Algeria**, and **Morocco** was 2000 years ago extensively utilized to provide livestock and crops to the Roman Empire. Much of it was covered with forests. Today, the climate has not changed much, but the area is largely desolate. W.C. Lowdermilk writes:

Over a large part of the ancient granary of Rome we found the soil washed off to bedrock and the hills seriously gullied as a result of overgrazing. . . . With the coming of the grazing culture, brought in by invading nomads from Arabia, erosion was unleashed by overgrazing of the hills. We can see here on the landscape how the soil mantle was washed off the upper slopes to bedrock. Accelerated runoff from the bared rock cut

gullies into the upper edge of the soil mantle, working it downhill as if a great rug were being pulled off the hills. In this manner has the country been seriously damaged, and the capacity to support a population much reduced. (Lowdermilk 1975)

Today, the region is still tremendously overgrazed by millions of cattle and tens of millions of sheep and goats. The United Nations reports that "Rangelands have been overgrazed with three head of cattle where only one could thrive Two-thirds of the land area of Tunisia is being eaten away by desertification." The Sahara is expanding north as well as south.

Far to the east, in **Egypt's** richly fertile, intensely overpopulated Nile River Delta, much potential cropland is used instead for the less efficient production of 5 million cattle.

Overall, Africa rivals any continent in the extent of livestock production damage. Overgrazing, forest clearing, and other livestock production activities are major factors in the decline of most African endangered wildlife, including the gorilla. Between 1850 and 1980 Africa lost 60% of its forest cover, perhaps mostly to promote livestock. African stock raisers have killed millions of large herbivores as competitors, and because they think that wildlife spreads livestock diseases. Historically, disease epidemics introduced by cattle have repeatedly decimated Africa's wildlife, causing severe ecological disruptions. Livestock protection rivals, and in many areas exceeds, sport hunting and poaching as the main cause of predator mortality, with similarly profound environmental consequences. Stock raisers encouraging new growth burn many millions of acres unnaturally each year. Overgrazing has caused gigantic dust storms and accelerated hydraulic erosion, displacing much of the soil over vast areas. Africa's infamous locust invasions, caused mostly by overgrazing, worsen the devastation. (The US and USSR military are currently collaborating on laser technology to fight Africa's locusts.) Livestock production has displaced many native tribal cultures, and is, along with human overpopulation and unjust food distribution, the major anthropogenic cause of relentless famine in Africa. The continent's cattle, sheep, and goat population doubled between 1950 and 1987, and continues to increase at a high overall rate, despite sporadic and massive livestock die-offs.

Across the Mediterranean, about half the area of the **European subcontinent**, excluding the Soviet Union and Scandinavia, is used to produce livestock. Other than India, this region has the heaviest concentration of cattle on Earth. It also has some of the worst sheep grazing.

Mediterranean scrub and woodland has been particularly hard hit. Centuries of overgrazing by sheep and goats, and later cattle, as well as environmental manipulation by their owners, left most of this area eroded and impoverished. Greece's ragged, scrubby condition may seem charming to us now, but its more fertile, verdant aboriginal character would have been more so. Much of **Yugoslavia's** forest was destroyed in ancient times for and by goats, sheep, and cattle. Sheep and cattle turned whole regions of **Spain** -- once lush Mediterranean shrub/woodland and steppe -- desertlike, while stockmen cut and burned millions of acres of forest for their animals. (The Spanish were the greatest historic influence on ranching in the Western US.) The drier

portion of southern **France** is being similarly desertified, and most of **Italy** has been devastated.

Very little of the Mediterranean region resembles its original character or environmental productivity, though paleontological studies show that today's climate is almost identical to the climate of ancient times. Georg Borgstrom, a widely respected authority on world food problems, has ranked the destruction of Mediterranean vegetation by goats and other livestock as 1 of the 3 worst ecological blunders in world history. (The other 2 were the Dust Bowl of the 1930s US, in which livestock were a major factor, and the deforestation of China's uplands around 3000 B.C., yet another instance where livestock have subsequently been the most potent human influence keeping the area in a degraded condition.)

Cattle and sheep in the **Pyrenees** compete with remaining wildlife and spread disease, while their owners kill the now-rare predators. Most of the grassy meadows in the **Alps**, once productive for wildlife, are denuded by livestock.

Nearly half of **central Europe's** well-watered flatlands and hills is farmed for livestock or grazed as pasture, most of it heavily. The grass may be greener here than in drier southern Europe, but this does not represent benign land use; stocking rates are much higher; native vegetation has been displaced, wildlife habitat ruined, and soil erosion intensified.

In the soggy **British Isles** -- where more than half of the land has been converted to livestock pasture -- intensive, long-term sheep and cattle grazing has stripped the land of native vegetation, laid bare and damaged the soil, and even created sand dunes in some areas. Herders from the European mainland invaded the British Isles beginning about 6000 years ago, cut most of the forest that covered the land, and exterminated all bears and wolves. Livestock kept forests from growing back by eating and trampling saplings. Recent reports are that intensive sheep grazing, clearing of livestock fields, and tree planting have diminished the heather on English moors by 25% in 20 years. (The British were the second most powerful historical influence on ranching in the Western US.) **Ireland** is "the Emerald Isle," but by far most of it is livestock pasture; competition for forage there is so intense that some stockmen force their herds of cattle to swim a mile or more out to small coastal islands to graze. Thousands of tons of Irish *seaweed* is harvested and fed to livestock.

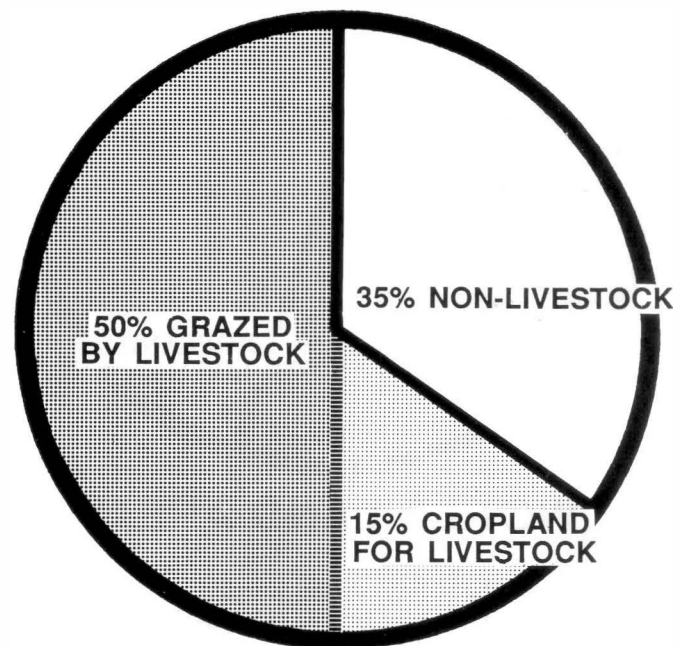
Even southern **Scandinavia** is home to about 10 million cattle and several million sheep, while much of northern Scandinavia is used for commercial reindeer. And according to an article in *National Geographic* (February 1987), sheep herders long ago stripped off virtually all of the forest that once covered much of **Iceland**, while subsequent overgrazing prevented it from growing back: "When the trees disappeared, so too did most of the well-drained soil, carried off by the incessant wind." About 20% of Iceland is grazed by sheep now, the remainder being barren, steep, covered with lava or ice, or excessively damaged by past grazing. Nearly all of **Greenland** is too barren, boggy, or ice-bound to be grazable, though some sheep are raised along its southern coasts.

Most of **Canada** is likewise ungrazable, being enveloped with cold, herbage-scarce conifer forest or Arctic tundra. However, about 200,000 square miles (an area 4 times larger

than New York) of the Great Plains of central Canada, most of south-central British Columbia, and portions of southeast Canada are grazed, mostly by 11 million cattle. Most of this land is overgrazed, in the west much of it with a welfare public lands ranching system similar to that of the US. As in the US, Canadian ranchers are foremost among those exploiting the wild and opposing protection for wolves, grizzly bears, and large herbivores in ranching areas. For example, the Canadian Cattlemen's Association recently presented a position paper to the Canadian Ministry of Agriculture recommending that the entire population of the world's largest free-roaming buffalo herd be exterminated from Alberta's Wood Buffalo National Park, a UNESCO World Heritage Site, because some of the buffalo are infected with brucellosis and tuberculosis. (The buffalo have carried these diseases since contacting them from cattle in the 1920s, before their forebears were shipped in from overgrazed areas to the south at the insistence of cattlemen who wanted to make way for more cows.)

And so we return to the **USA**. In **Alaska**, other than Eskimo reindeer herding in the northern and western coastal lowlands, livestock production is thus far limited to cattle on Kodiak Island, some of the Aleutian Islands, and around Anchorage; a few thousand sheep are grazed, mostly near settled areas. However, range professional D.C. Tomlin estimates that 10-13 million acres of grassland in Alaska have "potential" for cattle, sheep, and horses. Tomlin thinks that, rather than being inherently impractical for producing livestock, these areas are simply not yet socially structured to maintain a ranching establishment.

Not so 4000 miles south. Firmly entrenched, big-time ranchmen graze cattle on more than 1/3 of the area of the **Hawaiian Islands**. Tropical and sub-tropical paradise has been converted to cattle ranches and cropland. Feral goats and pigs also do extensive damage.



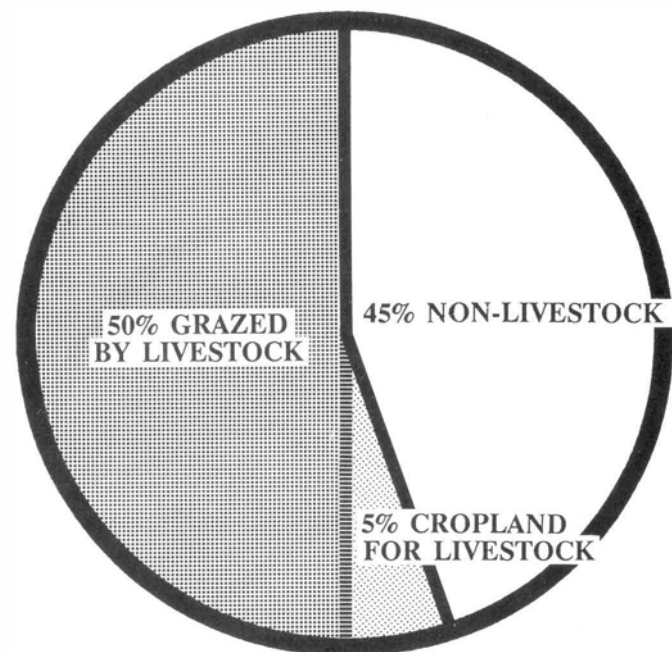
US LAND AREA
(outside Alaska)

According to the US Forest Service:

About 1/2 of the total land area of the continental United States is used for grazing livestock [by far mostly for cattle]. This area amounts to about 1 billion acres. (USDA, FS 1983)

Food production experts report that, in addition, more than 2/3 of the 444 million acres of cropland in the 48 states (15% of the contiguous US) are planted with livestock feed (56% for beef cattle). Roughly 80%-90% of all grain grown in the US is used to feed meat animals, mostly cattle, and about 40% of all US farm produce, including grain, is fed to livestock. To feed a typical American requires about 2 acres of cropland (more than 1/3 of which is used to grow food for beef cattle) and 4.4 acres of grazing land (nearly all of which is used for beef cattle). And, according to Worldwatch Institute, about 50% of all water used in the US goes to produce livestock or livestock feed, mostly for cattle, and a much greater percent of *consumptive* -- generally non-recyclable -- US water use is by the livestock industry.)

Therefore, **65% of the US outside Alaska is somehow employed in the production of livestock!** Most of this land is significantly impacted. While most American rangeland may look good compared to North Africa, the Middle East, or India, remember that *the US has been overgrazed and overcultivated for only a century, not millennia*, as has been the case in most of the "Old World." The vast bulk of the remainder not currently used for livestock is incapable of producing livestock, or is intensively used for other purposes. Some of this land suffers indirectly from livestock production, or from lingering influences of past livestock production.



WORLD LAND AREA

Altogether, about **50%** of the Earth's land surface is grazed by domestic livestock -- (23% as "rangeland") -- while an additional **5%** is farmed for livestock. Again, nearly all of the remainder is unsuitable for producing livestock, or is developed for other purposes. FAO estimates that **70%** of the Earth's land surface is *potentially* grazable.

The cows which dot this jungle-turned-to-pasture appear like white specks from above, and they begin to seem like cancer cells eating away at Mother Earth.

--Daniel Dancer, environmental photo-journalist

● **Tropical rainforests** are in many ways Earth's most important ecotype. They are the oldest continuous ecosystems, most having remained more or less in their present form for tens of millions of years. Experts estimate that although they cover only 2% of the Earth's surface, tropical rainforests are home to at least half of the 10-20 million animal species (most are insects) and perhaps 120,000 of the more than 280,000 plant species on the planet (including those in the oceans). Some recent estimates are that as much as 4/5 of the animal species and 1/2 of the plant species on Earth may depend on tropical rainforest habitat. Additionally, as many as 30,000 plant species and millions of animal species are thought to be as yet "undiscovered," most of them in rainforests. Tropical rainforests are crucial to the Earth's atmospheric balance, play a key role in moderating its climate, contain more than half this planet's live wood and unfrozen fresh water, and are the source of numerous food and medicinal plants. According to *US News and World Report*, in terms of ecological and human impact, loss of the Earth's rainforests would be tantamount to losing 80% of the world's vegetation.

Only a few centuries ago rainforest covered about 14%, or 8.2 million square miles, of the Earth's terrestrial surface. Axe, chainsaw, bulldozer, fire, hoof and mouth have reduced this to about 6%, or 3.5 million square miles. The United Nations FAO estimates that more than 41 million acres of world rainforest, by far mostly in the tropics, were completely and permanently cleared in 1990, up from 25 million in 1980. Additionally, more than 50 million acres are thought to be grossly disrupted annually. This would indicate that *more than 1.5% of the biome is being destroyed and 2% heavily degraded annually* (at constant 1990 rates). Satellite data indicate that in 1987, 20 million acres of rainforest were cleared in the Brazilian Amazon alone. The National Academy of Sciences estimates annual deforestation at *50 million acres* -- an area the size of England, Wales, and Scotland combined. Either estimate equals more than one acre per second. At this rate, the vast bulk of the Earth's remaining tropical rainforest will be gone within a single human life-span.

Contrary to popular images, the man with a chainsaw is as likely to be cutting for pasture as for wood. Livestock production is a leading cause of world rainforest denudation. However, because rainforests store most of their nutrients in the vegetation -- rather than in the soil, as do most terrestrial ecosystems -- cleared rainforest makes moderate to poor livestock pasture. When rainforest slash is burned, nutrients are lost as heat and smoke or rendered inaccessible to regrowth, as rainforests generally are not adapted to fire. Much of the regrowth that does occur is eaten or trampled by livestock. The thin soil, never before directly exposed to sun, wind, raindrops, or hooves, becomes drier than ever before, and is therefore damaged and easily eroded. Sediments damage waterways. Deforested land gradually loses productivity and stocking rates drop accordingly. Livestock grazing is the last commercial use



(Rainforest Action Network)

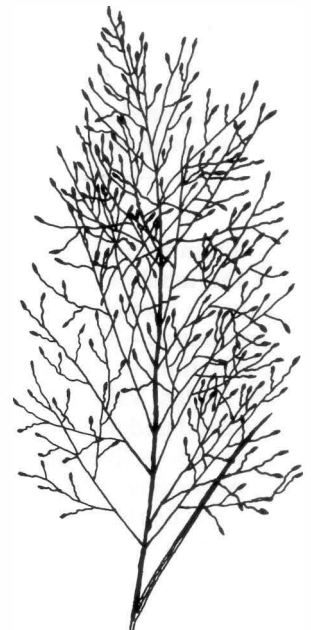
rainforest soils can support, so even in areas where the forest initially is cleared for some other purpose, livestock production often prevents restoration. Conversion of rainforest to pasture has been identified as the most destructive of all possible uses while, overall, livestock production is a (possibly *the*) major factor preventing world rainforest regeneration.

Burning rainforest for pasture also contributes to the buildup of CO₂ in the atmosphere, accelerating global warming by way of the "greenhouse effect." Some scientists think that about 25% of human-caused greenhouse gases come from burning rainforest.

Experts estimate that every quarter-pound of beef costs about 55 square feet of rainforest and thousands of individuals of hundreds of species. They say that during the past 600 million years the Earth's rate of species extinction was roughly 1 per year. Now they estimate the rate at *more than 3 per day* -- perhaps as high as 1 per hour -- scores of times higher than during the great ice age extinctions and during the demise of the dinosaurs. This is estimated to be the highest extinction rate in Earth's 4-billion-year history of life, roughly 1000 times higher than normal background extinction. At the present rate of acceleration, species extinction will reach *several hundred per day* in the early years of the next century. Scientists project that in the next 30 years more than 1 million species will become extinct and that *only a few human generations down the line the Earth may contain less than half as many plant and animal species as it once did!*

The planet's mantle of trees has already declined by a third relative to preagricultural times, and much of that remaining is damaged or deteriorating. Historically, the demand for grazing land is a major cause of worldwide clearing of forest of most types. Currently, livestock production, fuelwood gathering, lumbering, and clearing for crops are denuding a conservatively estimated 40 million acres of the Earth's forestland each year.

- Worldwide, grasses of more than 10,000 species once covered more than 1/4 of the land. They supported the world's greatest masses of large animals. Of the major ecotypes, grassland produces the deepest, most fertile topsoil and has the most resistance to soil erosion. Livestock production has damaged the Earth's grassland more than has any other land use, and has transformed roughly half of it to desertlike condition. Lester Brown of the Worldwatch Institute reports that "Widespread grassland degradation [from livestock grazing] can now be seen on every continent."



- **Deserts and desertlike conditions** have expanded proportionately, not only into former grassland but into shrubland, brushland, and even into former forest. In preagricultural times, only about 1/5 of the planet's land surface was desertlike. Mostafa K. Tolba, Executive Director of the United Nations Environment Programme (UNEP), summarizes the results of scientific studies by the UN:

Based on climatic data, more than a third of the earth's surface is desert or semi-desert Based on vegetation and soil criteria, however, it was found that 43 percent of the earth's land surface was desert. The difference . . . was man-made desert.

In 1977, experts attending the United Nations Conference on Desertification in Nairobi agreed that the greatest cause of world desertification in modern times has been livestock grazing (as did the US Council on Environmental Quality in 1981). They reported that grazing was desertifying most arid, semi-arid, and sub-humid land where farming was not occurring. Seven years later UNEP compiled, from questionnaires sent to 91 countries, the most complete data on world desertification ever assembled. According to the resultant 1984 assessment, more than 11 billion acres, or 35% of the Earth's land surface, are threatened by new or continued desertification. UNEP estimated that more than 3/4 of this land -- the vast majority of it grazed rangeland -- had already been at least moderately degraded. About 15 million acres (the size of West Virginia) of semi-arid or subhumid land annually are reduced to unreclaimable desert-like condition, while another 52 million arid acres annually are reduced to minimal cover or to sweeping sands -- more due to livestock grazing than any other influence. The world's "deserts" are expected to expand about 20% in the next 20 years.

Thus, livestock grazing is both the greatest cause of world desertification *and* the greatest detriment to the Earth's deserts.

The Worldwatch Institute estimates that each year 24 billion tons of topsoil over and above natural erosion are displaced from the Earth's surface due to human activities. Livestock grazing and livestock crop production cause accelerated soil loss over more of the globe than any other land use.

From woodland to grassland to desert, throughout most of the inhabited globe, livestock production is a primary cause of environmental deterioration *and* sustained degradation -- that is, prevention of recovery. Many ancient civilizations -- in southern Europe, North Africa, Arabia, the Indus Valley, India, central Asia and elsewhere -- declined under its impact, and the vast majority of countries have serious livestock problems now.

According to *New Scientist* (5-6-89), world cattle population has **doubled** in the past 40 years, and now stands at **1.3 billion**. In other words, the rate of cattle population expansion is even higher than that for humans! In total biomass, cattle now outweigh humans about 2 to 1. The United

Nations reports that the world's domestic sheep population increased 9% between 1974 and 1982 -- 3 times faster than the cattle population for those years -- while other sources indicate a continuing high rate of increase. Today, there are also about 1.3 billion domestic sheep, and (though they eat only about 1/5 as much as cattle) pound for pound, they are in some ways more destructive grazers/browsers. Countless millions of goats, pigs, buffalo, camels, alpacas, and other domestic stock add to the impact, while millions of feral goats, pigs, and other escaped or introduced livestock have ravaged environments in many areas. Projections for cattle, sheep, and goat populations indicate that high increase rates probably will continue to the year 2000 and beyond.

These dramatic livestock population increases reflect not only human population increases but modernized and expanded range development, including predator slaughter, roading, water development, fencing, vegetation manipulation, changes in grazing systems, and much more. As discussed, these and traditional, related human activities and methods of management often cause as much environmental damage as do the animals themselves. Much of this livestock increase also reflects increased feedlot and cropland livestock production; however, reports indicate increases in rangeland grazing pressure in most grazed regions.

The soil loss and degradation, water depletion and pollution, flood and sediment damage, desertification, deforestation, wildlife destruction, cropland loss and damage, energy and other resource waste, social and political inequities, and unjust resource utilization inherent to livestock production are all major contributors to hardship, poverty, and global conflict.

Now, all this would *seem* much less a tragedy if livestock production supplied great amounts of food for people. Livestock grazing and farming stand roughly together as the planet's leading causes of environmental decline (aside from human overpopulation and a more abstract but also fundamental cause, our withdrawal from Nature -- the 2 main problems underlying the rise of agriculture and livestock domestication). However, while about 10% (3.7 billion acres) of the Earth's terrestrial surface is cropland, *nearly half of this land is used to grow food for livestock*. Moreover, **non-livestock farming produces several times more in total food value for humans than all livestock production, cropland and rangeland**. (Half of the world's fish catch is also fed to livestock.)

According to Worldwatch Institute, altogether roughly 1/3 of the plant food grown on Earth that could be eaten by people is instead fed to livestock. According to world food and agriculture expert Frances Moore Lappe, the figure is 40%-50%. This food -- grain, legumes, fruit, vegetables, nuts, and seeds (even animal products) -- loses approximately 80%-90% of its food value to humans when cycled through livestock rather than being eaten directly by people. In other words, *we are being consumed by the livestock we think are sustaining us*.

In *State of the World: 1989*, Worldwatch Institute identifies 4 principal causes of global land degradation: (1) overgrazing; (2) overcultivation of croplands; (3) waterlogging and salinization of irrigated lands; and (4) deforestation. Let's more clearly identify these causes: (1) *Overgrazing/ranching* may be the greatest single cause of

environmental degradation. (2) As stated above, roughly half of the world's *cropland* is used for livestock. (3) A large portion of the world's *irrigated land* (irrigated land comprises 15% of all cropland) is irrigated to produce food for livestock, and much of this land is damaged by trampling livestock. (Irrigation accounts for 3/4 of global human water use, and more than half of the world's irrigated lands are already significantly damaged.) (4) Again, livestock production is a major cause of world *deforestation* and, perhaps more importantly, *prevention of reforestation*.

Thus, (aside from human overpopulation) livestock production is not only the planet's greatest environmental degrader, but, relative to what it provides humans, it is by far humanity's most environmentally destructive pursuit. Most of the Earth's arable and grazable land is already heavily used and is declining in productivity. Attempts to increase livestock production on existing and newly opened land are intensifying the environmental crisis and exacerbating global famine and social conflict.

Exaggeration? Fabrication? Not at all. The role of livestock production in world problems is **universally underplayed** due to many factors explained in this book.

Animal agriculture is the single most environmentally destructive industry in the world.

--Physicians Committee for Responsible Medicine

