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THE LACK OF FOOD SECURITY THROUGH THE AGES

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For everyone working to end world hunger

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Introduction

During World Food Day ceremonies in Rome, October 16, 2007, Dr. Jacques Diouf, director-general of the UN's Food and Agriculture Organization (FAO), lamented: "[O]ur planet produces enough food to adequately feed its entire population. Yet tonight, 854 million women, men and children will go to sleep on an empty stomach." (www.fao.org/wfd2007/wfd-resources/dg-message/en/)

Since he spoke, things have gotten worse. More recent FAO estimates for 2008 put the number at 963 million, a 40 million increase in one year. (See www.fao.org/news/story/en/item/8836/.) The trend is clear and worrying.

The 152 countries of the developing world are commonly grouped into six regions beginning with the largest population: East Asia and the Pacific (China prominently), South Asia (India prominently), Sub-Saharan Africa, Latin America and the Caribbean, Eastern Europe and Central Asia, and Middle East and North Africa. (siteresources.worldbank.org/DATASTATISTICS/Resources/CLASS.XLS).

The 2009 financial and economic crisis, rising energy and food prices, climate change and the loss of biodiversity have dealt blows to the quest for global food security. The hardest hit regions were Sub-Saharan Africa and Asia and the Pacific region. Alarming, that increase preceded 2008's global economic meltdown, which further aggravated food insecurity and poverty in developing nations.

Farming communities produce more food than they themselves can consume. Historically this achievement opened the way for the establishment of communities whose members could devote themselves to non-farm pursuits: manufacture, commerce, finance and the arts and sciences. The world we inhabit is the product of these past endeavors. We've reached a point where the human community is interconnected as never before. Humans are on their way to exploring and eventually colonizing other parts of the universe.

An essential underpinning to such progress is the certainty of where one's next meal is coming from. And yet, despite mankind's ability to feed itself, millions of people go to bed at night hungry. The poorest countries are those where agriculture is the mainstay of the economy. "The poor. . . are disproportionately farmers and herders and, perversely, the hungry also most commonly find their livelihoods through agriculture." (World Bank and International Food Policy Research Institute, 2006:9). Something is out of whack here. And one other thing. Ever notice that the rich don't go hungry? Hold that thought.

In this book I address the following question. How does the human community organize itself so that no one need be hungry? The word "does" can be taken in two ways. How in fact is the world organized in pursuit of this goal and how should it be so organized? I concentrate mainly on the former, look for gaps and offer a scheme aimed at the latter.

My approach is at once administrative, global and historical. That means addressing the following issues: (a) how the global community is organized to assure food security; (b) how things got that way; (c) what is lacking; and (d) where we should go from here. After all, if hunger and malnutrition exist, the fault—and the remedy—lies in human beings, our knowledge, our technology, our institutions, and our commitment.

Authors are invariably asked by publishers for their work's audience. In this case the audience is myself. Having written on global poverty, I could not avoid the connection between food deficits and poverty. The establishment of official national poverty lines often starts with the income needed for a minimally adequate diet.

Malnutrition is one of the most reliable predictors of poverty. Like everyone else, poor people seek to maximize the utility (to borrow the economists' jargon) of a cluster of factors—food, clothing, shelter, education, health, work, family, leisure and community. Without food, none of the others is possible but in varying degrees all are necessary. The poor are forced into more stark tradeoffs among these factors than those with greater resources.

The researching and writing of this book have helped educate me on the problem of global malnutrition. Famine, hunger, undernutrition—all nag at the human conscience. Since more than enough food is produced for the world's population, why should anyone have to go hungry? My earlier works on global poverty touched on the issue but did not go far enough. While poverty and hunger are intertwined, each must also be understood in its own terms.

As you can see from the bibliography, I rely on individuals and institutions with far greater expertise than mine. I have synthesized their work into a broad narrative with mounting emphasis on the past one hundred years.

In the first five chapters I reconstruct the evolution of agriculture, examine episodes of famine and related food emergencies. The next nine chapters examine efforts by the world community to alleviate hunger and malnutrition. All this is aimed at establishing the context of the problem but also the contours of a solution. The final chapter argues that a solution—or at least a big part of the solution—is cash. With money in hand the poor can buy the food they need. It's not quite that simple but the complications are manageable.

If interest in this book expands beyond its initial audience of one, the work will be well rewarded.

I. Ancient Agriculture

The happy outcome of a long evolutionary process, agriculture first appeared among societies of *Homo sapiens sapiens* in the early Neolithic (New Stone) era. Agriculture has come a long way over the past ten thousand years. Its emergence has indelibly shaped human history. Agricultural revolutions seem to occur every century rather than every millennium. A look back at the history of agriculture can illuminate its role in eliminating hunger and malnutrition.

The main centers of origin appear to have been (a) Syria-Palestine (10,000 years ago) (b) Central America (9,000-4,000 years ago) (c) Northern China (8,000-6,000 years ago) (d) Papua-New Guinea (10,000 years ago) (e) South America (6,000 years ago) and (f) North America (4,000-1,800 years ago). In these areas, predatory hunter-gatherers, probably settled near resource-rich marshes, lakes and rivers, gradually converted themselves into farmers and adapted to more sedentary lifestyles.

Whether hunter-gatherers simply “discovered” how to grow their own food plants and found the process conducive to sedentism or whether they were “forced” into it due to the scarcity of game and wild plants remains an unsettled question. Perhaps both factors were at work in varying degrees depending on the area under study. (Newman, Lucille, editor, 1995: 37-42; Smith, Bruce D., 1998: 208-14).

Neolithic-era people improved their stone tools by making highly polished, sharply flaked axes. Socially they grouped themselves into permanent village settlements. They pioneered true farming with wild and subsequently with domesticated seed plants that produced cereals like wheat, barley, flax, peas, and lentils.

“[B]y producing habitats where soil was disturbed, sedentary hunter-gatherers inadvertently created experimental garden-plots that a variety of wild plants . . . [could] invade and colonize.” (Smith, Bruce D., 1998: 20). They began keeping dogs, sheep, goats, pigs and cattle. Such animals were candidates for domestication in part because they tolerated breeding and feeding in confined areas, did not depend on rapid flight to escape predators, and formed gregarious social groups with a single dominant leader that could be displaced by a human master. (Smith, Bruce D., 1998: 27).

While overlap existed—and continues to exist—farming societies gradually became more clearly differentiated from animal breeding societies. The Neolithic agricultural revolution with its attendant social organization facilitated the growth and expansion of human populations.

Slash-and-Burn

Agriculture initially took form as gardens next to dwellings on soil covered with alluvial deposits or fertilized by animal waste. It was extended by Neolithic farmers to surrounding areas—forests that were partially cleared for sowing and planting and grassy lands like prairies and savannas for animal breeding.

In forested regions, slash-and-burn agriculture, first practiced in the Neolithic period, has persisted for thousands of years. Trees were cut down and cleared areas burned but with tree stumps left in place. The land was cultivated for a brief time, usually less than three years, then left idle for periods ranging from six, seven up to thirty or more years. Depending on the area, the cultivated land might yield cereals (rice, millet and maize); tubers (yams); roots (manioc, taro); legumes (peas, beans,

lentils); or a variety of fruits and vegetables. (Mazoyer, Marcel and Roudart, Laurence, 2006: 101-141).

At a certain point increased population density limits the availability of virgin forest reserves and makes slash-and-burn agriculture impracticable. The adverse consequences of this type of agriculture, which is still practiced in parts of Africa and South America, include deforestation, reduction of soil fertility, erosion, and desertification.

While slash-and-burn cultivation has been the most extensive and longest lasting, other systems emerged over time. Farmers and animal breeders in infertile arid regions moved toward alluvial valleys along the Indus, Tigris and Euphrates, and Nile. To protect against periodic flooding they developed hydraulic systems that included dikes, canals, dams, wells, and machines for adjusting water levels.

Between 7,000 and 5,000 BCE, small- and mid-scale agriculture had taken hold in Egypt, India, China and Indonesia. By 5,000 BCE the Sumerians in Mesopotamia were engaged in intensive land cultivation that relied on irrigation, a specialized labor force and use of domesticated animals both as food and as beasts of burden. The Greeks and Romans later built on these approaches.

In warm temperate Mediterranean regions, agriculturalists left eroded hilly land for animal pasturage and cultivated crops on lowlands with sedimentary deposits. They alternated, usually biannually, from planting to grassy fallowing. In Africa, to cultivate low fertility savannas, Congolese and Zairean farmers piled topsoil into mounds or ridges for planting and, to exploit organic minerals, burned these mounds with a covered fire. Other systems of plant cultivation employed the hoe coupled with animal breeding.

In the monsoon regions of Asia from India to southern China wet rice was first cultivated over six thousand years ago. Cultivation was expanded by the building of artificial lakes and rice paddies, terracing of slopes and irrigation.

Scratching the Surface

By the fourth millennium BCE at the latest, farmers had devised the ard or scratch-plow, which is still being used in parts of the Mediterranean and Near East. It is a simple device consisting of three elements: a handle (plowstaff) to guide its path, a shaft (plowbeam) attached to the person or animal pulling it and a sharpened stick (plowshare) to cut the soil. Because it could not cut deeply, the effectiveness of the ard was limited to lighter soils. (wings.buffalo.edu/ARD/etymology.shtml).

Over the centuries the basic ard became more sophisticated. For example, a horizontal piece or “frog” attached to v-shaped blades that moved the dirt away from the side of the furrow. The ard eventually gave way to the true plow with wheels for more efficient movement and a moldboard (curved sidepiece) for turning over the soil. (Mazoyer, Marcel and Roudart, Laurence, 2006:237-38).

In both hot temperate and cold temperate zones of Europe, slash and burn practices, fallowing and cultivation with the ard pulled by the ox, donkey or mule led to progressive deforestation over the period from 2500 BCE to the first centuries of the common era.

Thus, developments in agriculture over several thousand years, from hunting and gathering, to garden plots, to slash-and-burn farming, to specialized work forces, to irrigation and other hydraulic systems, to animal domestication, to fallowing, and to the invention of the hoe and the ard were the underpinnings of more sophisticated, more urbanized societies.

Much of the evolution in agriculture took place in pre-history, so there are no records of the individuals or groups that accomplished any given breakthrough. But these unknowns deserve our gratitude. The blessings of agriculture were however not uniformly distributed.

II. Greece, Rome and the Middle Ages

Crop failures and poor harvests in ancient societies had tragic consequences. Governments began taking measures to protect their citizens from extreme hunger and starvation.

In ancient Egypt, along the Nile, which regularly overflowed its banks between July and October, pharaohs built dams, canals and floodwater basins. "From November to spring it was possible to cultivate in these basins a whole series of crops . . ." (Mazoyer, Marcel and Roudart, Laurence, 2006:158). Wheat, barley, lentils, peas, broad beans and vegetable oils were the staples of the average Egyptian" diet, with wine and meat reserved for the upper classes. (Mazoyer, Marcel and Roudart, Laurence, 2006:160) In the reign of the Pharaoh Djoser (ca. 2770-2730), the failure of the Nile to overflow its banks for seven years caused one of the first recorded famines. (Ó Gráda, Cormac, 2009:32). To cope with such disasters, grain was stored in high yield years and sold at subsidized prices in low yield years.

In Greece and Rome, food was not infrequently scarce, though outright famine was rare. (Newman, Lucille, editor, 1995:126-144). In Greece starting in the eighth century BCE, land was increasingly concentrated into the hands of the few while population grew due to declining infant mortality. The demand for food tended to outstrip production. Impoverished small farmers began to emigrate, spurring Greek colonization around the Mediterranean.

In Athens reforms introduced during the sixth century BCE successively under the legislator Solon, the tyrant Pisistratus and chief magistrate Cleisthenes led to the breakup and redistribution of large estates and the formation of a strong peasant class. Nevertheless chronic grain shortages persisted. Greek land favored the cultivation of olive trees which, however, require long-term investment (twenty plus years) and grapes, which demand a great deal of care in rocky soil. (en.wikipedia.org/wiki/Agriculture_of_ancient_Greece).

After Athens lost its maritime dominance in the fourth century and could no longer reliably import grain, it passed laws prohibiting the export of wheat and required merchants to deliver the bulk of their cargoes to the city. Prices were fixed and purchase limits imposed on grain speculators. For the most part, however, in Athens and elsewhere food security for the poor depended on the charity of the well-off. By the fourth century land in Athens and elsewhere was once again being controlled by large property owners. (Mazoyer, Marcel and Roudart, Laurence, 2006:248-251).

Following Greece, only on a much grander scale, Rome colonized the entire Mediterranean area. This brought immense wealth into the city. Competition from colonial products caused major falls in the prices of cereals, wine and olive oil. Roman landowners of large estates (cultivated by slaves) and some independent small farmers focused on growing fruits and vegetables and the breeding of animals, goods that were difficult to transport. Other small farmers were forced off the land and into the city thus swelling the ranks of the plebians.

From 137 to 121 BCE, the Gracchi brothers, Tiberius Sempronius and later Caius, tribunes of the populares (the general population), tried to restore the class of small family farmers by limiting the size of landholdings and seizing the excess from large landowners for redistribution. They may have been motivated by fear of losing the class that had largely supplied the ranks of the Roman army. Notably, to minimize price and supply fluctuations created by imports, the Gracchi also built storehouses

for excess grain and put a ceiling on prices. In hard times this evolved into a dole for the poor.

The Gracchi brothers, having incurred the enmity of the senatorial nobility, were each assassinated. Nonetheless the reform impulse persisted. A class of small and medium farmers able to cultivate olive trees and grapevines gradually was reconstituted and achieved some prosperity. Despite the Gracchi reforms as they were known, the large estates grew even larger as latifundias. The Gracchi did introduce a new style of politics which confronted the optimates (the “best” people) with the demands of the populares.

Since Italy was not self-sufficient agriculturally, grain was imported from Sicily, Sardinia and Africa. By the end of the Republic, usually marked by the battle of Philippi (42 BCE), the dole had been well-established. Free supplies of grain were distributed to hundreds of thousands of citizens, many of them landless poor who migrated to Rome. (Everitt, Anthony, 2006:99)

Agricultural Advances in the “Dark Ages”

During the fifth century CE, invading tribes took over lands of the Roman Empire in Western Europe and North Africa. In 476, Odoacer, a Germanic general, deposed Emperor Romulus Augustus. Odoacer continued at least formally as a client of the Emperor in the East at Constantinople. (Thus the “decline and fall” motif made famous by Edward Gibbon refers solely to the western portion of the Roman Empire. The Roman Empire in the East remained strong for centuries until finally falling to the Ottomans in 1453.) In the West, noble and military landowners in Europe sought to stave off marauding bands by organizing their private properties into fiefs. Peasant serfs worked the land in exchange for sustenance and protection.

Over several centuries a full-blown feudal system emerged in Europe. Even so, in many areas, particularly Celtic, Germanic and Slavic communities, communal lands remained available to serfs and free peasants alike for pasturage and wood collecting. The dues paid by peasants to their lords were fixed by custom; hence, with expanded or more intensive cultivation, peasants could enlarge their share of the output. This contributed to the growth of Europe’s population from 1000 to 1300.

During these misnamed “Dark Ages”, both structural and functional innovations were adopted, particularly in cold temperate regions of northern Europe. Farmers incorporated the animal-drawn plow, scythe, sickle, cart, wagon, harrow, roller, collar harness, neck yoke and shoeing of horses, cows and oxen.

A Horse of a Different Collar

In China, the invention of the breast collar for horses in the fourth century BCE marked a shift away from the less efficient throat-girth harness. With the throat harness, the harder the horse pulled, the more it choked off its own breathing. By contrast, with the fully developed horse collar, which conformed to the horse’s neck and shoulders in a way that did not block airways, the horse could push rather than pull its load, a more efficient method.

The introduction of the horse collar into Europe did not occur until 1,400 years later. It made a huge difference. To move ploughs and wheeled carts, plodding oxen were gradually replaced with horses. Since horses could work fifty percent faster than oxen, European farmers were better able to produce surpluses which could be traded at crossroads markets. (en.wikipedia.org/wiki/Horse_collar). Markets morphed into

towns, commerce flourished and the feudal system gradually succumbed to a more urban-oriented society.

Functionally there were improvements in the management of crops, pastures and animal breeding as well as systems of fallowing and methods of clearing. (Mazoyer, Marcel and Roudart, Laurence, 2006: 261-269). The plow, fertilization with animal excrement and fallowing were distinct but interrelated elements of a true agricultural revolution. With increased herd sizes and wider use of stabling, there was an enormous increase in animal excrement for use as fertilizer. (Mazoyer, Marcel and Roudart, Laurence, 2006:263, 273).

In hot temperate areas around the Mediterranean like Spain and Italy, farmers continued to rely on the ard but did make improvements through terracing, irrigation, arboriculture and associated (multiple) cropping instead of monoculture. (Mazoyer, Marcel and Roudart, Laurence, 2006:217-223).

Muslim farmers in North Africa and the Middle East enhanced their irrigation systems with water wheels, dams and reservoirs. They adopted the Chinese moldboard plow and invented the three field crop rotation system. Arab and Muslim traders helped in the diffusion of such methods along with literally hundreds of new crops to and from the known world.

(en.wikipedia.org/wiki/Muslim_Agricultural_Revolution).

Trade and Famine in Medieval Europe

Medieval Europe incorporated a broad and complementary set of agricultural methods. Yields increased with the expanded use of fallowing and harnessed draft animals. Better diets and the reduced risk of famines stimulated population increase in Europe from the eleventh to the thirteenth centuries. Nonagricultural pursuits became more commonplace. Craftsmen were needed to fashion and maintain farm implements like wagons, plows, and yokes. Blacksmiths shod animals and made iron tools like coulter (vertical digging knife on a plow) and plowshares (cutting edge of a moldboard or curved blade on a plow that turns over the soil).

The demand for iron expanded and spurred advances in manufacturing processes like more powerful bellows and tilt-hammers, each operated through water mills. Water mills and windmills were used for more than iron manufacturing; they operated equipment in oil factories, tanneries, breweries and flour mills among others. Cistercian monasteries, which featured both agricultural enterprises and iron factories, helped spread these modern methods in Europe. (Mazoyer, Marcel and Roudart, Laurence, 2006:293-297).

Marketable surpluses of wheat, fish, salt, wine, furs, wool, tools, and other commodities were sold or exchanged outside the region of their production. This stimulated trade among the cities around the North and Baltic seas (mainly through the Hanseatic League, formed around 1241 in Hamburg).

In southern Europe, Mediterranean trade routes plied by Italian merchants from Genoa and Venice fostered trade with Asia and brought in luxury items like silk, ivory, jewels and spices. Merchants and bankers relied more and more on money to facilitate transactions, thereby birthing proto-capitalism, which even extended to the formation of joint stock companies in the twelfth century. (Mazoyer, Marcel and Roudart, Laurence, 2006: 293-297).

The proliferation of great cathedrals and other religious structures testifies to the wealth and central role of the Church in the life and mores of the Christian West. But the rising tide of prosperity fell sharply in the fourteenth century. Agricultural production could not keep pace with population which by then was some three times

greater than during the tenth century. Widespread famine between 1315 and 1317 killed thousands of people in cities and countryside alike. It was one of many recurring famines throughout Western Europe. A downward spiral ensued as fewer workers were available for agricultural production.

An additional crushing blow was struck by the infamous “Black Plague” of 1347-51 which was brought to Europe from Asia on caravans and merchant ships and which decimated the already declining European population. These developments were predictably attended by endless war, revolt, repression, pillaging, and banditry. Population fell to tenth century levels.

Plowing Ahead Fallow-free

Europe’s fortunes revived in the fifteenth century. Although diminished in scale, the plow-based agrarian system augmented by fallowing and the related crafts and industries had persisted throughout the devastation. Compared to the tenth century, the money supply was much greater and labor shortages induced wage increases. Large landholding nobles instituted tenant farming and sharecropping. Land was cleared, villages were rebuilt and Europe once again reconstituted itself agriculturally. But not entirely in the same way.

Once brought under cultivation, the available land was either planted, left fallow or turned over to pasture. Over time the volume of food production reached an equilibrium. Altering the balance might bring short-term harvest gains but invited declines longer term.

Expand planting of cereals in fallow land and you may not have sufficient animal excrement to fertilize the crops. Plant cereals rather than grasses in pastureland and you also limit livestock breeding and manure output. Increase fallowing and pastureland and you diminish cereal-growing capacity. The right balance among planting, pasturing and fallowing had to be maintained to reach the system’s productive capacity.

In Flanders a system of cultivation with very short or even *without* fallowing periods began to develop. England followed suit. Land that had previously lain idle was converted to pasture seeded with ryegrass or planted with fodder crops like clover, sainfoin, alfalfa and turnips. Fodder crops did double duty: feeding animals and restoring soil fertility as effectively as fallowing. How? That takes us a bit beyond this book’s theme. Briefly the fodder crop biomass captures mineral content that would otherwise be lost through leaching, drainage and denitrification. (Mazoyer, Marcel and Roudart, Laurence, 2006:320). Similarly, seeded pastureland helped with weed control as well as animal grazing.

Thus cereal-fallowing rotations were replaced by cereal-fodder rotations. The result was more extensive breeding of herbivorous animals, greater draft power and doubling of manure volume. It thus became possible to feed a much larger human population without expanding the agricultural workforce. More people could engage in nonagricultural activities like commerce, mining and industry.

Over a two thousand year period, from roughly 500 BCE to 1500 CE, agriculture became more specialized and trade around the Mediterranean basin and later throughout Europe increased. With the demise of the Roman Empire in the west, an agriculturally based feudal system emerged but gradually ceded prominence to commerce and urbanization.

Improvements in agricultural tools and equipment, advances in animal breeding and better management of cultivated land led to tradable surpluses. The population

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of Europe grew until it outstripped the pace of agricultural production. This along with the Black Plague led to a precipitous decline in population. But during the fifteenth century Europe recovered.

And near the end of the century, Columbus sailed the ocean blue. With the European exploitation of Africa, access to new maritime routes to southeast Asia and discovery of America, world trade in agriculture ramped up considerably.

III. Asia, Africa, and the Americas

Asia

In China, some seven or eight thousand years ago, farm settlements were first established along the banks of two great river systems, the Yellow River in the drier, colder north and the Yangtze in the rainier, warmer south. Along the Yellow River farmers cultivated millets and other crops. The Yangtze, which flows through temperate and subtropical climate zones, was suited for rice.

According to most scholars wet rice farming was introduced into southeast Asia from south China somewhere between five and four thousand years ago. Asian rice (*Oryza sativa*), which is cultivated in flooded fields or “paddies”, today accounts for one-fifth of the calories consumed by the human race. Some scholars contend that rice agriculture began farther south than the Yangtze. In this scenario, hunter-gatherers first sought to control wild rice and improving methods of cultivation made their way north. However, current evidence points to the middle and lower Yangtze River for the earliest domestication of rice. (Smith, Bruce D., 1998:116-7, 122).

In China the struggle to feed a growing population was incredibly hard. Throughout their nation’s history, Chinese peasants have methodically cultivated, manured, and tilled their soil right to the tops of surrounding hills. But even these indefatigable laborers could not always withstand the effects of meandering rivers without well-defined channels, long periods of drought and devastating crop failures. (Mallory, Walter H., 1926: 36).

The lack of reliable statistics about rural China in past centuries hampers the study of famine there. It appears that famine hit at least one province in China almost every year from 108 BCE through 1911, according to the records of Chinese scholars.

While drought, floods, war, and deteriorating infrastructure played their roles, so too did the failure of official intervention. Lack of a strong central authority, inadequate grain storage and impassable roads hampered famine relief. Many people died unnecessarily.

North China has been most vulnerable to the threat of famine. A series of famines from 1333 to 1347 due to Yellow River flooding led to six million Chinese deaths and weakened the Yuan (Mongol) dynasty (1215-1368). The Qing or Manchu dynasty, China’s last (1644-1912), coped with food crises with measures like emergency food relief, subsidized sales of grain, and food loans.

In 1743-44, the province of Hebei (also known as Zhili since it was “directly ruled” by the Qing) and northern Shandong were devastated by a two successive years of spring monsoon failures. These led to drought and a precipitous drop in barley and especially winter wheat yields. Fortunately, the Qing had established a network of stable buffer stock or “ever-normal” granaries. Under ever-normal granary schemes, governments stabilize food prices at “average” levels by buying and storing grain in surplus years, then selling it in shortage years, thereby offsetting potentially volatile fluctuations in market prices.

Under the skillful administration of governor-general Fang Guancheng, peasants in officially designated disaster counties were issued rations from provincial granaries regardless of wealth and without any labor requirement; additional relief supplies were drawn from tribute depots and other granaries outside the affected areas. “Two million peasants were maintained for eight months, until the return of the monsoon made agriculture again possible.” (Davis, Mike, 2002: 281).

Costly military ventures, notably war against the peasant-inspired White Lotus rebels (1796-1804), court corruption, a succession of devastating floods (1839-1855), opium-based trade deficits—these over time depleted the imperial treasury and sapped grain reserves. Ever-normal granary inventories and tributary grain flows plummeted. (Davis, Mike, 2002: 353). To keep peasants from emigrating and foreign powers from accessing the interior, the Qing dynasty perversely refused to build roads and lay rail lines. Imperial infrastructure could no longer protect local populations from famine and other disasters.

An astounding forty-five million Chinese are thought to have perished as a result of famines in the first half of the nineteenth century (1810, 1811, 1846 and 1849). The second half of the century fared only slightly better: an 1867-68 famine under the Tongzhi Restoration was relieved but an estimated 9.5 to 13 million people died a decade later in the drought-induced Great North China Famine of 1877-78. (en.wikipedia.org/wiki/Famine)

Famine has been a recurrent feature of India's history. Crop failures in India historically have been traced to erratic rainfall patterns that in turn are governed by monsoons. These strong seasonal (June through September) and moisture-laden winds from the Indian Ocean sweep over hot desert land in southwestern India, triggering heavy rainfall and wild storms. As far back as the fourth century BCE, India's rulers initiated public employment schemes to foster food security. Rulers also coped with food shortages by opening granaries, remitting taxes, and constructing public works.

While monsoons can generate deadly floods, they also enable farmers to “coax their crops from the soil.” (www.pbs.org/wnet/nature/monsoon/html/intro.html). It's a precarious business. Too little rain stifles crop growth; too much rain washes away plants and seedlings. India suffered fourteen famines from the eleventh to the seventeenth centuries. (Bhatia, B.M., 1985). Under British rule, the number of famines appears to have increased (though improved recordkeeping cannot be discounted as a factor).

A 1901 Indian Famine Commission report found no fewer than twelve famines and four “severe scarcities” between 1765 and 1858. (en.wikipedia.org/wiki/Famine_in_India). To cite one particularly tragic case, in 1770 no rains came and some ten million people in Bengal died. In 1866-67, a third of the population of Orissa perished due to famine. Conditions were exacerbated by British policies, including heavy taxation and conversion of farmland into foreign-owned plantations.

The mortality numbers for both China and India beggar the imagination, all the more so since the deaths were in large measure avoidable had adequate relief systems been in place. Famines also afflicted Japan during the Edo Period (1603-1868) and Vietnam during World War II, when Japanese occupation led to some two million deaths.

Africa

Some seven thousand years ago, the Sahara included areas that received sufficient rainfall to sustain grasslands. In the savannah, pearl millet, sorghum and cowpeas were domesticated. Open fields facilitated cultivation but poor soils prevented intensive farming. Populations remained small and non-urbanized. Hunter-gatherers settled near lakes and marshes where they fished, hunted wild cattle and harvested wild plants and grasses. The herding of domesticated cattle led to the establishment of pastoral economies. Sheep and pigs also were later incorporated as well, with cattle retaining the predominant role. Scholars differ on whether the cattle were

domesticated independently or were initially brought in from the Nile Valley and north Africa. (Smith, Bruce D., 1998: 106).

Around six thousand years ago, both the Sahara and the Sahel—a belt south of the Sahara several hundred miles wide that runs from the Atlantic Ocean to the Red Sea—began to dry out. This process eventually formed the now well-known barrier of sand dunes and desert between the north and south of the African continent.

North Africa benefited from the fertile flood plains of the Nile Valley. The Nile enabled its inhabitants to cultivate wheat, barley and grapes and to keep sheep, goats and cattle. It sustained a more dense population and gave rise to Egyptian civilization. Importantly, the kingdom of Kush in Nubia and the Axumite kingdom in Ethiopia developed economic and trade ties to north Africa while serving as a route for the passage of ideas and technologies to the south.

Sub-Saharan Africa became home to people speaking any of several hundred Bantu languages, part of a larger grouping in the Niger-Congo family of languages. Bantu speakers were goatherds that over several millennia expanded throughout southern Africa. (en.wikipedia.org/wiki/Economic_history_of_Africa). Millet, sorghum and African rice were cultivated in the central and southern sections of the Sahara by 1,500 BCE. Somewhere between 3,000 and 1,000 BCE, local economies featured a mix of seed crops and herding of domesticated animals. (Smith, Bruce D., 1998:109-10).

In the first millennium of the common era, crops began to arrive from southeast Asia, including the banana, cocoyam and water-yam. Asian rice supplanted its African counterpart in many areas. The Indian Ocean proved to be reasonably hospitable shipping route.

Trade in the interior of Africa was jump-started by the arrival of Islamic armies. The introduction of the camel by Muslim merchants enabled trade to flourish across the Sahara. New states arose in the Sahel. The kingdom of Ghana and the empires of Mali in west Africa and Kanem in north central Africa traded profitably in gold and slaves. On the east coast Swahili traders exchanged gold, ivory and slaves for Chinese pottery and Indian fabrics. (en.wikipedia.org/wiki/Economic_history_of_Africa).

European colonization of Africa began as an effort to counter the Ottoman Empire's trading hegemony. For several centuries Venice and Genoa positioned themselves as mediators between Europe and the Ottomans. Looking for alternate trade routes, Portugal's Prince Henry the Navigator financed expeditions along the west Africa coast. In 1488, Bartholomew Dias rounded the Cape of Good Hope at the continent's southern end; in 1497-98, Vasco de Gama followed the route all the way to Calcutta, India. Christian Europe's trade with southeast Asia no longer had to pass through Muslim-controlled lands.

In the succeeding centuries the Portuguese and Dutch, followed by England, France, Belgium and Germany, explored and colonized much of Africa. Under colonial rule, plantations were established. The owners employed cheap, often slave, African labor to grow cash crops. Sugar, cotton, and coffee plantations often overused their soils and degraded the environment.

Drought, pests, wrongheaded government policy, mismanagement, corruption and conflicts have combined in various ways to threaten food security in Africa. Throughout its history, pests and drought-induced famine have wracked Ethiopia. In the twentieth century famine afflicted the Sahel area, especially Niger, Chad and Burkina Faso (1970s), Ethiopia (1973, 1888-92, 1984-85), Uganda (1980), and Sudan (1970s, 1990, 1998).

Perhaps the worst case was Ethiopia's 1888-1892 famine brought on by drought and the introduction of rinderpest from India that killed ninety percent of Ethiopia's

cattle. A third of the country's human population perished. (en.wikipedia.org/wiki/Famine).

The Americas

Some fifteen to twenty thousand years ago, during the extremely glaciated Pleistocene epoch, hunter-gatherers from Asia migrated across the Bering Strait land bridge that connected Siberia and Alaska. By twelve thousand years ago, human colonizers had extended their reach all the way to the southern tip of South America. (Smith, Bruce D., 1998: 146). Over the next ten thousand years, hunting and gathering gradually gave way to more settled communities based on plant cultivation and animal husbandry.

In what is today southern Mexico and the Yucatan Peninsula, the Maya people established settlements starting around 1800 BCE. For centuries before that the area had already been inhabited by other peoples, e.g. the Olmecs, and there was considerable cultural diffusion. The Mayans improved the writing, astronomy, mathematics, calendars and epigraphy borrowed from their neighbors. This enabled their civilization to prosper, mainly between 250 and 900 CE.

During this period, the Maya built thousands of structures in a number of religiously and artistically allied (but politically independent) city-states, including large stepped pyramids, temples, palaces, and inscribed monuments. They worshiped a large pantheon of gods, including the Tonsured Maize God; the rain god Chaac; and the great winged serpent Quetzacotal (later Quetzacoatal).

To feed a large and extended population, in an area of poor soils, the Maya employed a number of methods, including slash and burn (or swidden) agriculture, permanently raised fields, terracing, forest gardens, managed fallows, and wild harvesting. While maize was the primary staple, they also cultivated beans, cacao, maguey, bananas and obtained honey from bees.

(en.wikipedia.org/wiki/Maya_civilization).

In the fourteenth century, in central Mexico, a civilization grew up that we designate as Aztec, though this refers not to one but several ethnic groups who shared a common language (Nahuatl) as well as customs and religious practices. The "gods" of the Aztec peoples were not independently existing entities but rather impersonal forces that were represented in statues and figurines. The Aztecs particularly venerated the "god" Huitzilopochtli, personification of sun and war. A striking feature of Aztec religion was human sacrifice on a grand scale.

The Aztec Triple Alliance consisted of the people of Tenochtitlan, located in Lake Texoco; the Alcohuas of Texoco; and the Tepanecs of Tlacopan. In conquering other city-states in the region the Triple Alliance expanded the range of trade and transportation but also fostered animosity among the subjugated peoples by imposing a burdensome tributary system. (en.wikipedia.org/wiki/Aztec).

Aztec agriculture featured areas of fertile arable land called chinampas. These were in essence artificial islands, rectangular in shape (very roughly, eight by one hundred feet) and formed with alternating layers of mud and decaying vegetation. Canoes passed along the channels separating the chinampas. They were fertilized by human excrement and lake sediments. Crops included maize, beans, squash, amaranth, tomatoes, chiles and, interestingly, flowers. At least half the food consumed in Tenochtitlan came from surrounding chinampas.

(en.wikipedia.org/wiki/Chinampa).

In 1521, Spanish conquistadores led by Hernán Cortés, and aided by Nahuatl-speaking allies, conquered the Aztec capital Tenochtitlan. The Spanish conquest of the Aztec and shortly thereafter the Inca Empire upended pre-Columbian civilizations.

In South America, Inca rule in the fourteenth and fifteenth centuries of our era extended over a large and diversified land mass that featured the Pacific coast, Andes Mountains and Amazonian plain. The Incas dominated other tribes whose methods of production, trade and transport were incorporated into the empire's agrarian systems. Lacking the plow, wheel, harness and a system of writing, the Incas nonetheless adapted agricultural practice to widely varying environments.

Counting and record keeping were accomplished with the *quipu*, colored and knotted strings made of llama or alpaca hair and cotton that were used for recording data. Daily runners carried messages encoded on *quipus* to and from the capital Cuzco regarding storehouse inventories, taxes owed, workers needed for communal projects, etc. In this manner Inca rulers used *quipus* to monitor their empire. (Katz, Victor J., 2009: 372-73).

Canals along the coast supplied water for the growing of maize, beans and cotton among other crops. Farmers in the Amazonian plain, which was relatively unpopulated, grew maize, manioc and the coca leaf. In high south-central Andean valleys, beginning some four to five thousand years ago, peasant labor terraced and irrigated the land where varieties of potato were cultivated. Noteworthy was the *chuño*, potato that was preserved by freeze-drying (through alternate exposure to sun and nighttime cold) and *chichi*, fermented drink made from maize. Quinoa was probably brought under domestication in the southern Andes four to five thousand years ago. Smith, Bruce D., 1998:173).

The Incas raised herds of llamas for food, clothing and transport of goods. The agricultural economy featured other camelids (that is, members of the camel family), notably alpacas and vicuñas, as well as guinea pigs. Like the Egyptian pharaoh, the Inca, descendant of the Sun-God, exercised absolute rule over a largely peasant society which could be recruited for large work projects, army service, transport of goods and labor on the lands of the aged and disabled.

The rapid dismantlement of the Inca Empire in 1531 by Fernando Pizarro and fellow Spanish conquistadores and the founding of the viceroyalty of New Castile four years later had immense consequences. Inca territory was taken over by the Spanish Crown and the Church and organized along feudal lines. Canals and irrigation systems were neglected. *Encomiendas*, large landholdings worked by native peasant populations, passed mainly into the hands of the conquistadores and their immediate descendants, but also in some cases to Incas loyal to Spain or to religious orders.

In the last quarter of the sixteenth century, these landholdings gave way to *haciendas*, estates based on private property rather than royal land grants. (Mazoyer, Marcel and Roudart, Laurence, 2006: 205-216). Spain brought to its colony new plants (e.g. barley, oats, rye, grapevines), animals (e.g. oxen, sheep, pigs, horses) and tools and equipment (sickle, hoe, cart, grain mill, spinning and weaving devices).

In the eastern woodlands of North America crop plants were most likely first harvested in the wild over four thousand years ago and eventually domesticated. These included gourds, squashes, goosefoot (a species of chenopod), marsh elder and sunflower. (Smith, Bruce D., 1998: 184, 190). In the southwest, from three to two thousand years ago, maize-growing societies settled along river valleys where they blended hunting and gathering with farming at seasonal base camps. Eastern and southwest North America appear to have emerged as independent centers for the domestication and cultivation of wild plants.

Maize reached the continent's southwest around 1200 BCE and the eastern woodlands in the first two centuries of the common era. As it had in Central and South America maize became the most important plant crop of North America.

With Europe's discovery of America, the stage was set for the globalization of trade that included the introduction of new animals (e.g. horses, pigs chickens) into the Americas and new agricultural products (e.g. corn, potatoes, chocolate, tobacco) into Europe.

IV. Four Centuries of European Agriculture

The agricultural reforms that began in the fifteenth century spread throughout the temperate zone of northern Europe over the following three centuries. Where non-fallowing was practiced both agricultural output and labor productivity doubled. Agricultural surpluses both fed (literally) and also fostered demand in the expanding nonagricultural and urbanizing sectors of society. Eventually the farm population would be surpassed by the non-farm.

These developments of course took place within larger economic and social transformations, notably the Renaissance (fourteenth to seventeenth centuries) and the Industrial Revolution that began in the eighteenth century and marked a seismic shift from a manual labor economy to machine-based manufacturing.

In the north, places like the Netherlands, England, France, Germany, Austria, Switzerland, northern Portugal and northern Spain exported wheat and barley as well as domestic animals like horses, cows and sheep to other parts of the world, including the New World. Non-farm population growth gave impetus in Europe to commerce, urbanization and the Industrial Revolution.

By contrast, Southern and Eastern Europe (e.g. southern Spain and Portugal, Italy, Hungary, Russia) continued with traditional practices within surviving elements of the feudal regime all the way up to the twentieth century. A large obstacle throughout southern and eastern feudal Europe was the long-standing right of common grazing; in practice this meant that farmers could pasture their animals on the fallow land of others as well as their own. Restricting or abolishing this arrangement was strongly resisted especially by small farmers who, lacking large herds of their own, counted on fertilization of their fallow fields by other farmers' livestock.

The clinging to feudal rights and privileges among the peasantry—as distinct from exclusively private property regimes—and indifference to agricultural and industrial development among landed (but often absentee) elites slowed the introduction of more modern systems of cultivation into southern and eastern Europe. As a consequence these regions endured periodic (and, one might add, technically unnecessary) food shortages, famines, servile labor conditions and industrial underdevelopment. (Mazoyer, Marcel and Roudart, Laurence, 2006:313-315).

Despite stubborn clinging to traditional common rights, movement toward owners' unrestricted use of private property took hold, particularly in England and northern Europe. This development afforded opportunities for large and medium-sized landowners with sufficient investment capital to reform their livestock breeding and crop growing systems.

In England and Flanders, for example, lands were enclosed, removing them from common grazing. Instead landowners planted fodder crops, raised sheep and supplied wool to an expanding textile industry where a variant of the early steam engine was employed to drive factory equipment.

Steam engines were soon applied to machinery in other types of factories, mills, railroads, ships and even clocks. Well-to-do grain-growing farmers increased yields to satisfy the demand for bread from expanding workforces in textiles and other industries. Many small farmers who could not compete were forced off the land and into cities where they swelled the ranks of often underpaid and exploited factory workers.

Pre-industrial Europe of the eighteenth century periodically fell prey to grain harvest shortfalls, followed by food shortages and higher mortality rates from

epidemic diseases. The shortfalls engendered several deleterious effects—higher prices, undernutrition or even famine, rising unemployment, more crime and social disorder.

Diseases like typhoid, typhus, dysentery, and smallpox spread on an epidemic scale. Overcrowded public shelters with poor hygiene fostered conditions in which body lice could proliferate and trigger epidemics of typhus and relapsing fever. Begging, vagrancy and rural to urban migration contributed to the wider geographic spread of disease.

With public granaries and state control over prices and grain markets, Prussia and Denmark helped stem the spread of epidemic diseases in the early 1740s. In contrast, the policies of England, Ireland, France and the Low Countries, under which the destitute were jammed together in workhouses and soup kitchens, were less successful in combating crisis mortality and social disruption. (Newman, Lucille, editor, 1995:241-280).

Unaware of proven public health measures, many governments unwittingly exacerbated the impact of harvest shortfalls. Public institutions, rampant with unsanitary and overcrowded conditions, were settings in which deadly infectious diseases could more easily spread.

The constituent assemblies of French Revolution and subsequent governments promoted new, more progressive agricultural methods—but without total success. Common grazing persisted through the nineteenth century in a number of villages. To some degree, however, large Church and secular landholdings were broken up and common forests and pastures were redistributed or sold, all to the benefit of small and medium-sized farms.

The physiocrats were economists who opposed prevailing mercantilist attitudes. Instead of focusing on wealth and balance of trade issues, they viewed land as a key source of economic (including industrial) development. However, they denigrated the role of the peasantry and pressed for expansion of large farms employing wage labor. Prominent among them were Anne-Robert-Jaques Turgot (1727-1781) and Francois Quesnay (1694-1774). Their ideas preceded classical economic theory, as subsequently exemplified in Adam Smith's *Wealth of Nations* (1776). (en.wikipedia.org/wiki/Physiocrats).

Mechanization and Overproduction

Nineteenth century agriculture tipped from under- to overproduction thanks to advances in mechanization, railroad expansion and steamship design. New markets opened up and transport costs were driven down, often to the detriment of local producers who could not compete with lower priced imports.

While France and Germany opted for agricultural protectionism in the form of higher duties on imports, England in essence took the opposite tack by supporting free trade. For example, the Corn Laws imposed tariffs in 1815 to support British corn prices against cheaper grain imports especially from the United States. “Corn” in its historical sense, could mean any grain and the Corn Laws referred mainly to wheat. English production of wheat, barley and wool declined as the country became more dependent on cheaper imports. The laws were repealed in 1846. Economic activity shifted away from agriculture and toward industrialization. (Mazoyer, Marcel and Roudart, Laurence, 2006:369-73).

During the nineteenth century, new seed varieties, inventions of more efficient farm implements and innovative methods of cultivation boosted the yield per acre. The first half of the century witnessed an astonishing variety of metallic agricultural

equipment: plows reinforced with iron or steel, reversible Brabant plows (actually two plows in one), harrows, sowers, winnowers, chaff- and root-cutters, hay tedders, reapers, threshers, grinders, creamers, the list goes on.

Railroads and steamships opened up vast lands in North and South America, Australia, and Africa and facilitated transportation to and from overseas markets. Steamships with screw propellers reduced the cost of transoceanic shipping. As a result, “(b)etween 1850 and 1900, wheat exports from the United States to Europe increased . . . from some 5 million bushels to close to 200 . . .” (Mazoyer, Marcel and Roudart, Laurence, 2006:369). Food preservation, distribution and safety took several steps forward in the nineteenth century. Canning was invented in the early 1800s. By the 1850s bananas were being shipped to Europe from the tropics.

With seemingly inexhaustible virgin lands and a flexible class structure, inventor-entrepreneurs like Cyrus McCormick, inventor of the reaper and manufacturers like the John Deere and McCormick companies, American farmers were quick to adopt the new equipment. Canada, Australia and Argentina followed closely behind.

Not until the second half of the century did large farms in Europe, especially England and Prussia, use more modern machines on a broad scale. On small farms in a country like France the industrialization of agriculture was not accomplished until 1950. Depression and two world wars in the first half of the century played a role but so too did the persistence of peasant labor carrying the weight of the feudal tradition and a heavy dose of government protectionism.

In the late nineteenth and early twentieth centuries, the development and rapid spread of new engines further revolutionized agriculture, industry and transportation. Steam engines were used to power some American tractors beginning in the late 1800s but soon fell out of favor. Steam tractors were found to be too heavy, prone to explosion and mechanically complex. The remedy was the internal combustion engine.

The Ford Company’s Fordson model, introduced early in the twentieth century was lighter, less expensive and more versatile than its steam-powered predecessors. (eh.net/encyclopedia/article/white.tractors.history.us).

Soil fertilization had been practiced for centuries by adding organic or mineral matter (e.g. manure, leaves, lime) but advanced significantly in the nineteenth century. Europe imported guano from Peru and nitrates from Chile.

The processing and synthesizing of fertilizers became a growth industry. Exploitation of phosphate materials like butchery and fish bones evolved into production of superphosphates in factories that opened between 1843 and 1870 in England, Germany, United States and France. In 1870 mines in Germany began exploiting the mineral fertilizer potassium. (Mazoyer, Marcel and Roudart, Laurence, 2006:366-67). Not distinguished from sodium (salt) for centuries, potassium was discovered in 1807 by Sir Humphrey Davy who extracted it from potash. Besides being an essential nutrient, it is also used in the making of gunpowder, glass and soap.

Famines Amid Surpluses

Surpluses mounted but famine did not disappear. Overproduction could be offset by government indifference and/or incompetence, a theme that would recur at various times and places. In the 1840s blight ruined potato crops in Europe, with the most severe consequences in Ireland where the potato had become the principal food for a third of the population. Potato blight is a fungal disease caused by spread of the water mold organism *phytophthora infestans*.

(en.wikipedia.org/wiki/Phytophthora_infestans.)

The Great Famine in Ireland (1845-49) left one million dead and another million refugees who escaped to Britain and the United States. Anglo-Irish landowners (of English descent) did little for their tenants. While the Irish people starved, food exports to Britain not only continued but actually increased, abetted by the British army and a Whig government which held fast to a free market approach. The effects of famine—poverty, disease, infertility, and emigration—led to population declines on the island for over a century. (en.wikipedia.org/wiki/Famine)

In strict numbers (as opposed to proportion of the population) Irish mortality due to famine paled in comparison to the experience of India and China. In 1865-66, an estimated one million people died in Orissa, an isolated area in the southwest area of Bengal, India. Between 1876 and 1879, a drought-induced famine devastated Madras, Mysore, Hyderabad and Bombay in south and southwest India (the Deccan Plateau), taking between six and ten million lives. (Davis, Mike, 2002: 7).

Along with natural disasters, British rule is blamed for exacerbating Indian famine in the nineteenth century. The British created large plantations out of confiscated local farmland, restricted internal trade, taxed the Indian people heavily to support military expeditions and exported staple crops to Britain. British resistance to price controls fueled grain speculation. New railroads were “used by merchants to ship grain inventories from . . . drought-stricken districts to central depots. . . .” (Davis, Mike, 2002: 26). With the aid of the telegraph, merchants could coordinate price increases over a large area, thereby putting available food beyond the reach of poor peasants and laborers. (Davis, Mike, 2002:26). Surplus wheat and rice produced elsewhere in India was shipped off to England.

British viceroy Lord Lytton resisted organized efforts to alleviate famine, contending that providing relief supplies and lowering food prices would only encourage shirking. (en.wikipedia.org/wiki/Famine_in_India). Doling out food to the starving would induce continuing demand, absorb government tax revenues, drain away wealth from India and Britain, and foster unsustainable population growth. The Malthusian mindset reigned supreme. Private market forces were the Conservatives’ answer to starvation.

Faced firsthand with the catastrophic results of his policies, the viceroy grudgingly established a Famine Insurance Grant which purportedly would support future famine relief works but which produced mixed results. (en.wikipedia.org/wiki/Famine_in_India). At least some of the funds went to “raising taxes to redeem cotton duties and finance the invasion of Afghanistan.” (Davis, Mike, 2002: 56).

A creature of political pressure, a royal Famine Commission was established. Its 1878 report blamed widespread famine mortality in southern India solely on crop failure due to drought, not British decisionmaking. The Commission did however formulate a precedent-setting policy framework for predicting and ameliorating famines. Its 1880 Indian Famine Codes categorized levels of food insecurity—near-scarcity, scarcity, and famine—with related metrics (e.g. crop failure, abnormal price rises), established an early warning system and set forth conditions for relief assistance. It became a model for other provincial codes in India and for relief efforts worldwide well into the twentieth century.

If southern India fared horribly, northern China fared worse. Between 1876-1879, drought-induced famine along the Yellow River basin claimed anywhere from ten to twenty million lives. (Davis, Mike, 2002:7). To block foreign penetration into the country’s interior, the Qing dynasty “had refused to build railroads or telegraphs.” (Davis, Mike, 2002: 64). Venal local officials looted county granaries. Desperately

hungry people killed pack animals and livestock for food and ate anything else accessible—roots, clay, garbage, refuse, body parts of corpses. Children were killed and eaten by their parents and vice versa.

Months after the fact, Beijing received reports of the devastation in five northern provinces (Shanxi, Shaanxi, Henan, Kiangsu, and Shandong) and parts of others bordering them. The government bureaucracy organized relief campaigns in lackluster fashion and relief expeditions faced maddening transportation obstacles in the delivery of supplies. Government storehouses outside the affected provinces remained full while millions starved.

Familiar blame-shifting tactics were again employed by the British when drought and famine struck again, between 1896-1902, hitting central India hardest and claiming anywhere between 6.1 million and 19.0 million lives overall. (Davis, Mike, 2002:7). While regional famine codes had been put into effect and a Famine Relief and Insurance Fund established in 1880, these measures paled under the scale of the disaster.

Regarding Indians as “natural shirkers and beggars”, Lord Elgin herded those too weak to work into poorhouses that were infamous for miserable diets, rapacious overseers, and lingering deaths from starvation. (Davis, Mike, 2002:147). Grain reserves elsewhere in India and in Burma that were sufficient for relief were instead sold to pay off debts and overdue taxes. (Davis, Mike, 2002:161). Grain traders profited by shipping grain from countryside to urban centers.

Contributing to famines in Asia were El Niño-Southern Oscillation (ENSO) events, that is, warm ocean currents originating off the west coast of South America that affect climate conditions in the eastern Pacific and Asia. At their worst these events drastically diminish monsoon-driven rainfall and can be attended by drought and crop failure. Even when the monsoons finally came to China in 1878, it took years for normal agriculture to resume, since much of the labor force was dead and diseases like dysentery plagued the survivors. (Davis, Mike, 2002:64-79).

While massive mortality hit India and China the hardest, famine afflicted many other countries as well—Ceylon, Korea, southern Java and Borneo, Philippines, north Africa (Egypt, Algeria, Morocco), Angola, South Africa and northeast Brazil. (Davis, Mike, 2002: 61).

The colonial powers, infected with social Darwinism and Malthusian gloom, preached the virtues of free trade and reacted with massive indifference to famines. When pressured to respond they did too little, too late. The British in India, the Dutch in Borneo, the Spanish in the Philippines, the Portuguese in Angola, the French in Vietnam and Algeria—all stood aside as grain speculators hoarded available supplies, prices exploded out of reach for many, sharecroppers and peasants were displaced, refugees were blocked from entering big cities, and relief efforts foundered. “[G]rain merchants . . . preferred to export a record 6.4 million cwt. of wheat to Europe in 1877-78 rather than relieve starvation in India.” (Davis, Mike, 2002:31-32).

In Brazil’s Nordeste the *Grande Seca* (Great Drought) of 1876-79 it is estimated that half a million people died, one hundred thousand from starvation, the rest from related diseases or harmful, even poisonous food. (Davis, Mike, 2002:114). [A lower mortality estimate of 200,000-500,000 is found in Webb, Kempton E., 1974:31.] Drought struck again in 1888 and lasted until 1891.

Nutrition as Science

In the second half of the nineteenth century food laws and food control systems

were put in place in a number of countries. The newly recognized discipline of food chemistry was employed to assure the purity of food and identify any with harmful industrial chemicals. (World Health Organization and Food and Agriculture Organization, 2006:6). In the Austro-Hungarian Empire product descriptions and standards for various foods were collected between 1897 and 1911. Issued as the Codex Alimentarius Austriacus, they lacked legal force but were nonetheless used by courts in assessing the standards for certain foods. (World Health Organization and Food and Agriculture Organization, 2006: 6-7).

Between 1890 and 1939, nutrition emerged as a mature science that built up an integrated body of knowledge on nutrition, both human and animal, an understanding of the body's energy needs, and the identification of key vitamins and minerals. Early on, the quality of the products traded between countries surfaced as an issue. In 1903 the International Dairy Federation developed standards for milk and milk products. The Federation helped catalyze the Codex Alimentarius Commission to develop international food standards. (See Chapter VI below.)

Over four centuries agriculture in much of Europe was transformed. Mechanization took hold. As private property regimes superseded feudal arrangements, capital investment in agriculture increased and modern methods of cultivation were adopted. Still there was no escape from periodic food shortages and epidemics. Overcrowding in unsafe and unsanitary workhouses spread infectious diseases.

The nineteenth century saw further progress in new seed varieties, the variety of farm equipment and yields per acre. Synthetic fertilizers were produced on an industrial scale. Official incompetence and indifference rather than scarcity of food left millions dead due to famine in Ireland, India, China and Brazil. The quality as well as the quantity of food standards emerged as an issue and, toward the end of the nineteenth century and the beginning of the twentieth, the study of nutrition was put on a scientific footing.

The pattern of astonishing progress in food production and devastating episodes of hunger and malnutrition ramped up in the twentieth century.

V. World War II, Famine and Food Security

If the nineteenth can be dubbed the century of agricultural mechanization, the twentieth is less easily characterized. Along with more complex machinery it featured electric and gasoline motors, new seed and plant varieties; the “industrialization” of animal breeding and chemically created fertilizers; and the emergence and rapid expansion of biotechnology. (en.wikipedia.org/wiki/Agriculture).

Bigger, more powerful tractors were built that could pull equipment combining more than one operation such as harvester-threshers. Plowing the soil and sowing grains could be done on one pass. A single worker could cover about five hundred acres (200 hectares). Gains in productivity were such that in developed countries the entire population could be fed by one-twentieth of the labor force. The remainder was freed up for work in industry, service sectors and government.

These developments propelled growth in the number of big farms employing wage labor and specializing in one or two “product lines” like corn or grapes or dairy goods. Conversely they also led to the decline of underequipped and undercapitalized family farms. Agriculture benefited from global transportation networks that sped deliveries of food products from farm to fork. Falling prices for food commodities and lower transportation costs stimulated trade within and among countries.

Agriculture as a Complex Business

Farm management had to become more sophisticated. For example, more diversified plant varieties required large amounts of fertilizer that had to be absorbed in an economically profitable way. Profitability depended not only on the size of the yield but also the cost of fertilizers, other input costs (e.g. seeds, pesticides), market prices for products (wheat, rice, corn, etc.), available supply and distribution chains and consumer preferences.

The planting and harvesting of crops were but one factor—indispensable, to be sure—in a complex agro-industrial system. Various industries turned out fertilizers, pesticides, motorized farm equipment and supplies on the input side. Livestock feed industries supported cattle ranchers and other animal breeders. Farm produce was subject to milling (flour), refining (sugar), processing (dairy goods), and brewing (beer). Large corporations took over processing and distribution.

A classic case is the U.S. Company Archer Daniels Midland, founded in 1902, incorporated in 1923, and currently operating in fifty-eight countries on six continents. It ranks as one of the world’s largest processors of corn, oilseeds, wheat, coca and other feed stuffs. It employs over 26,000 people, owns or operates nearly 24,000 railcars and has 230 processing and manufacturing facilities worldwide.

The company turns crops into human food ingredients including flour, vegetable oils and soy. It makes a variety of feeds for a wide range of animal species and is heavily engaged in the production of renewable biofuels. It is a key player in grain trading, transportation, and terminal (including warehousing) services. (www.admworld.com/naen/).

Contemporary agricultural policy must therefore mediate—or, if you prefer, navigate politically—among landowners; small, medium and large farms; grain growers and livestock breeders; a range of agriculturally-oriented industries; domestic producers versus foreign competitors; advances in nutrition and nutrition sciences;

environmental group demands; overall economic development; and, oh yes, consumers.

Governments in developing countries face a dilemma. They are pressured by domestic constituencies to protect agriculture through mechanisms like price supports and import duties. Yet by so doing they risk maintaining agriculture in a state of low productivity that falls further and further behind international competitors.

Lubin's Legacy

A Polish-born Jew, David Lubin (1849-1919), merchant and agriculturalist, who lived in both the United States and Europe, was instrumental in founding the International Institute of Agriculture in 1905. Due to his advocacy, the Institute opened in Rome in 1908 under the sponsorship of Italy's King Victor Emmanuel III.

After World War I, the League of Nations came into being. Its Health Organization was extremely active in the arena of public health. Interestingly, and presciently, one area of activity had to do with housing. The Health Organization collected valuable data on urban and rural living conditions in Europe and elsewhere. Its Housing Commission sought to define sanitary standards for different living environments taking into account factors like climate and customs.

World War II interrupted this work which was taken up later by organs of the United Nations. (United Nations, 1947: 152). The Technical Subcommittee on Nutrition of the oft-maligned League spearheaded the international movement toward better nutrition. It led efforts to set international standards for caloric requirements, definitions of vitamins and measurement of malnutrition. (Vernon, James, 2007: 128).

The Great Depression of the 1930s highlighted the connection between a low income and malnutrition. Despite agricultural surpluses hungry people could not afford to buy food and as a result many farmers lost their farms. The lesson was that healthy people depended on a healthy agriculture in a healthy economy.

On an international level, the International Institute of Agriculture helped farmers to share knowledge with one another, obtain credit, produce goods more systematically and gain greater control over marketing. The organization managed to survive through two world wars but closed its doors in 1945. But Lubin's legacy was not ignored.

War, Famine, and Progress

World War II (1939-45) ruined or ended the lives of millions of people. In 1943 Bengal endured a famine which took the lives of more than two million people. (Ó Gráda, Cormac, 2009:94). Despite reduced imports from Burma, which had fallen to the Japanese, and a 1942 cyclone that caused widespread flooding and crop failure, there was still an adequate supply of rice. The crisis was due to war-time demands for food reserves and ill-founded rumors of further crop failure that led to hoarding and price inflation.

Rice stocks became an attractive investment and landowning peasants actually prospered. The victims of famine were low-wage landless workers, fishermen, paddy huskers and others who could not afford rising rice prices. Astonishingly, as documented in a pathbreaking study by Sen, the government of Bengal did nothing to prevent food exports, secure imports or buy rice from speculators to distribute to starving people.

(Sen, Amartya: 1981:58-; en.wikipedia.org/wiki/Bengal_famine_of_1943#cite_note-4.)

One cannot minimize let alone forget such tragedies. But the war also engendered progress in science and technology, not least in the fields of medicine, hygiene and nutrition. Beginning in 1942, the Rockefeller and Ford Foundations spurred agricultural development in Mexico and subsequently helped establish the Consultative Group on International Agricultural Research (CGIAR).

In 1943 the Mexico-Rockefeller Foundation International Agriculture Program was established as a collaborative venture in agricultural research. Among other accomplishments, semi-dwarf varieties of high yielding wheat were developed that enabled Mexico to become self-sufficient in that grain. The new knowledge was transferred to famine-prone India and elsewhere in the Asian-Pacific region and led to significant productivity increases.

From May 18 to June 3, 1943, representatives from forty-four nations met at Hot Springs, Virginia for a United Nations Conference on Food and Agriculture and pledged to found a permanent organization dedicated to food and agriculture. The Hot Springs conferees realized that widespread poverty, food shortages and malnutrition in Europe and elsewhere would need the world's attention once war ended. Lester Pearson, a member of the Canadian delegation, who helped forge agreement among the conferees, was asked to chair an Interim Commission on Food and Agriculture. Two years later, in Quebec City, Canada, the Food and Agriculture Organization (FAO) was officially established as a specialized agency of the nascent United Nations.

The United Nations

War was destroying much of Europe's productive capacity and transportation infrastructure. Anticipating victory, representatives from forty-four nations met July 1-22, 1944 at Bretton Woods, New Hampshire, to plan for a post-conflict world. Out of their deliberations came two institutions, the International Bank for Reconstruction and Development and the International Monetary Fund. The first is commonly called the World Bank and the two together, the Bretton Woods Institutions.

A third, the International Trade Organization, did not materialize. Its charter, signed March 24, 1948 in Havana, was not ratified by the U.S. Congress. An alternative arrangement, the General Agreement on Trade and Tariffs (GATT), served as the regulating instrument for international trade until taken over in 1995 by the newly formed World Trade Organization. (Clark, Robert F., 2005: 25-29). Despite some loose usage inferring such, GATT was not an organization. Rather it was a treaty whose signatories were contracting parties.

In 1945, representatives of fifty countries met in San Francisco at the United Nations Conference on International Organization. Working with proposals from China, the Soviet Union, the United Kingdom and the United States, the delegates drafted the United Nations Charter which was signed on June 26, 1945. Poland, which was not represented at the Conference, signed it later and became one of the original 51 Member States. The United Nations came into being as a formal voluntary compact among the world's nations on October 24, 1945. (www.unac.org/en/link_learn/canada/pearson/part_ii.asp).

On February 12, 1946 the General Assembly decided that the United Nations should take over the health-related activities of the League of Nations. The last assembly of the League of Nations occurred in April 1946. By the end of August the functions of the League had effectively been transferred to the United Nations.

Final approval of the August arrangement was given by the UN's Economic and Social Council on September 17, 1946, paving the way for the transfer of a nucleus of

officials in the League's Health Section to the new Interim Commission of the World Health Organization on October 16, 1946. (United Nations, 1947: 46). The transfer included important work (as well as staffing) in the areas of epidemiology, health statistics and international biological standards. For example, before the war, thirty-five medicinal substances, whose titration required biological methods, had been standardized by experts under the aegis of the League of Nations. The World Health Organization continued this work which is key to the development of therapeutics. (United Nations, 1947: 59-60).

Sir John Boyd Orr

In 1946, the first Director-General of the Food and Agriculture Organization, Sir John Boyd Orr (1880-1971), proposed the creation of a World Food Board. It would work toward stabilization of agricultural commodity prices, establishment of a world food reserve for emergencies, financing for the disposal of agricultural surpluses, and cooperation with other entities dealing with trade policy and international credits for economic development.

Orr was a physician, biologist, professor and 1949 Nobel Peace Prize recipient. From a Scottish farming family, he earned an M.D. degree at the University of Glasgow. In World War I he served in the Royal Army Medical Corps and the Royal Navy. He directed the Rowett Research Institute in Aberdeen from 1919 to 1945. He served as first director-general of FAO (1945-48). Subsequently he made a fortune in the stock market and through service on corporate boards. He was also variously rector of the University of Glasgow, president of the World Academy of Art and Science, and member of Parliament.

(nobelprize.org/nobel_prizes/peace/laureates/1949/orr-bio.html).

Concerned about diminution of their national sovereignty, the United States and the United Kingdom opposed Orr's proposal for a World Food Board. In its stead there was established an FAO Council. Lacking the teeth of a World Food Board, the Council's role was (and is) to monitor the world food situation and where necessary bring emergency needs to the attention of national governments. (Shaw, D. John, 2007: 15-31).

The Food and Agriculture Organization conducted its first world food survey in 1946. It was followed by others in 1952, 1963, 1977, 1987, 1996. While not strictly comparable due to differences in methodology, the surveys collectively documented progress in per capita food consumption levels but with "significant black spots." (Shaw, D. John, 2007: 250).

A key measure was the number and proportion of people worldwide whose per capita food consumption exceeded 2,500 kilocalories, the amount considered sufficient for healthful productive living. (Calories or kilocalories? The terms seem to be used interchangeably. A calorie is the unit of energy (heat) required to raise the temperature of a gram of water by one degree Celsius. A kilocalorie is a thousand calories. The calories on food packages are actually *kilocalories*. So, the 100 "calories" posted on your soda bottle are actually 100,000 calories. Unfortunately, the confusion isn't limited to food packaging; it's worked its way well into popular discourse and may even in a book like this.)

The Right to the Right Food

The 1948 Universal Declaration of Human Rights, issued by the UN General Assembly, declares: "Everyone has a right to a standard of living adequate for the

health and well-being of himself and of his family, including food, clothing, housing and medical care and necessary social services . . .” The Declaration was adopted and proclaimed by General Assembly resolution 217 A (III), December 10, 1948. A right to food is included in Article 25(1). This implied a legal entitlement to food within the framework of the UN Charter.

The entitlement approach was first elaborated by Amartya Sen (1981). It has not lacked for critics. (Deveraux, Stephen, 2001). Analytically food entitlement dovetails with Sen’s concept of poverty as capability deprivation, that is, the inability to enjoy freedom fully. Overcoming such deprivation requires attention to one’s basic needs including food.

Globally, implementation of everyone’s right to food requires: (a) sufficient agricultural production; (b) equitable distribution systems within and among nations; (c) safety nets in the form of food security and antipoverty programs; (d) the ability of households to buy food; (e) consumption of adequate amounts of nutritious food by individuals.

GATT Gets Going

Development was expected to occur through trade and investment. After the adoption of the first agreement on January 1, 1948, in Geneva, the General Agreement on Trade and Tariffs (GATT) served de facto as a means for negotiating trade issues among nations. Despite its provisional nature, GATT launched the world’s multilateral trading system. It issued the rules for much of the world’s trade for nearly half a century, fostered trade liberalization and oversaw periods of very high growth rates in international commerce. Eight rounds of trade negotiations have been completed since the creation of GATT. As of this writing, a ninth, under the Doha Development Agenda, is ongoing.

Seven GATT conferences followed the first Geneva Conference, the last being the Uruguay Round from 1986 to 1994. By then the global trading system had become so complex in a number of areas—services, intellectual property and agriculture, to name three—that a more formalized structure was called for. Interestingly, however, “the General Agreement still exists as the WTO’s umbrella treaty for trade in goods, updated as a result of the Uruguay Round negotiations.” (World Trade Organization. 2007:

The first half of the twentieth century found humanity embroiled in two devastating world wars. Yet it also engendered remarkable advances in many fields, including agriculture. There were powerful and more versatile farm machines and equipment, greater varieties of seeds, increasingly sophisticated farm management, industrial level specialization in the production, processing and distribution of food products, and lowered transportation costs. In the wake of nations ruined by war, food and agriculture emerged as international priorities.

VI. Food for Peace, Progress and Profit

From its inception, the United States has responded to food emergencies elsewhere. In 1812, President James Madison sent emergency aid to earthquake victims in Venezuela. In the 1920s Herbert Hoover led a huge feeding program in Russia and headed famine relief in World Wars I and II. Under the Marshall Plan, launched in 1949, the United States shipped massive quantities of commodities to a devastated Europe. (U.S. Agency for International Development, 2004).

On July 10, 1954, President Eisenhower signed into law P.L. 480, the Agricultural Trade Development Assistance Act, subsequently renamed the Food for Peace Act. Under the Act, U.S. food aid is delivered mainly through six programs: Titles I, II, and III of P.L. 480; Food for Progress; McGovern-Dole Food for Education and Child Nutrition; and Section 416(b). (See Appendix 1.) Food for Peace is administered by the Agency for International Development and works through a large network of nongovernmental organizations and private voluntary organizations.

Some 150 countries have received U.S. food aid. During the 1960s, 70s and 80s, India was the largest recipient of such aid. In that highly populated nation, Food for Peace partnered with CARE and Catholic Relief Services. While pockets of hungry people remain, American food aid, the Green Revolution, expanded agricultural production and improvements in health care and food distribution systems have enabled India to achieve food self-sufficiency.

In response to severe drought, from 1999 to 2002 (before and after the 9/11 attacks), Food for Peace sent almost 400 thousand metric tons of food aid to Afghanistan. In 2003, U.S. food aid to Ethiopia—over one million metric tons—is credited with averting widespread famine on the scale that had occurred in 1984-85. During the Iraq war, Food for Peace delivered food aid to the country's 26 million citizens.

The Consortium for Southern Africa Food Security Emergency (C-SAFE) is a regional response to the food security crisis in southern Africa, led by three International Non-Governmental Organizations (NGO's) - CARE, Catholic Relief Services, and World Vision, with an additional member in Zambia, Adventist Development and Relief Agency. With funding from Food for Peace, C-SAFE works to improve household food security in Zimbabwe, Lesotho, Zambia, Mozambique, Swaziland, and Malawi.

Commemorating the fiftieth anniversary of the Food for Peace Program, July 21, 2004, USAID administrator Andrew Natsios noted that programs under the Act had sent more than 106 million metric tons of American food at a cost of about \$33 billion to more than 150 countries. (www.state.gov/e/eeb/rls/rm/64268.htm). The United States provides over half of the world's food aid supplies.

Food Aid and the Food Trade

International food aid, surplus disposal and trade promotion have been linked from the start. The 1953 FAO Conference took note of the growing surpluses of commodities, cereals in particular, that had been accumulating in the United States since World War II. While the United States was clearly entitled to assure disposal of its surpluses, the FAO Conference was concerned about the impact on international trade. The potential downsides of food aid on donor countries' commercial exports and developing countries' markets pointed to a need for governance mechanisms.

The issue was taken up by the Committee on Commodity Problems (CCP) and its subsidiary the Consultative Subcommittee on Surplus Disposal (CSSD). A major concern

was the impact of food aid programs on agricultural production and commerce, particularly the risk of market disruption.

(www.fao.org/docrep/meeting/009/j4865e.htm#P26_3081).

A path-breaking 1954 study by the CSSD helped shift the focus from donor-driven surplus food disposal to recipient countries' food security. A 1955 study distinguished between food aid projects for welfare and food as support for general economic development. (Food and Agriculture Organization, 1954, 1955). Subsequent studies examined the growing tensions between direct food aid, concessional aid with commercial elements, commercial transactions with concessional elements and just plain commerce. (Food and Agriculture Organization, 2006:18).

FAO's Principles of Surplus Disposal and Guiding Lines sought a balance between donors' exports of food and other agricultural products on concessional terms without replacing their normal commercial imports and trade patterns. The Principles are nonbinding and depend on the willingness of signatories to abide by them.

A Revolution—But Green?

Over a ten-year period beginning in 1943, research funded by the Rockefeller Foundation and the government of Mexico fostered development of new varieties of wheat that enabled Mexico to become self-sufficient by 1956. Buoyed by this success, in 1960 the Rockefeller and Ford Foundations established the International Rice Research Institute at Los Baños in the Philippines. The Institute's research produced a new rice plant hybrid, the famous IR8, whose high yield launched the green revolution. This was followed by other new high-yielding seed varieties whose value was recognized by the governments of developing countries. (Harrison, Paul, 1993: 93-94).

The green revolution consisted of a package of agricultural reforms, including rapid dissemination of the new seed varieties, better use of moisture through irrigation and controlled water supplies, more widespread use of fertilizers and pesticides, and the development of related farm management skills. It was aided by public investments in rural infrastructure projects, reforms in national agricultural research systems and cooperation with international agricultural institutes.

The impact of the green revolution was greatest in Asia. It became the foundation for significant economic growth in China and elsewhere in South and Southeast Asia. Rice production in countries like Sri Lanka and Pakistan soared. India, dependent on monsoon rains and historically vulnerable to crop failures, converted from food-deficit status to agricultural exporter. Consumers benefited as real food prices in Asia and elsewhere in the world have declined while rural incomes have increased.

"Between 1961 and 2000, cereal yields increased by 291% in China and 147% in India." (Gill, Gerard J., et al. 2003:1). Other east and south Asian countries achieved yields in excess of 150 percent. Farmers abandoned traditional practices in favor of new seed varieties, chemical fertilizers, pesticides and irrigation.

The blessings were not unmixed. Extensive use of agrochemical-based pest and weed controls in some crops raised environmental and health concerns. Water management required skills that were not always available. In the short- and medium-term, the green revolution led to an oversupply of food, which drove down prices and adversely affected the incomes of small farmers who were faced with paying off the high costs of seed, pesticides and equipment.

The shift to tractors and other mechanized equipment that came with the green

revolution benefited richer and more “progressive” landowners but also led to job losses among tenants and sharecroppers. Food surpluses were often exported to richer countries instead of being distributed to the producer country’s own poor. Low pay in the producer countries meant that workers could not afford to buy the very foods they were exporting.

While valid, these concerns do not obviate the benefits of the green revolution which include sparing millions of people from hunger and malnutrition and relieving large nations, India prominently, from dependence on food imports. In 1970 the Nobel Prize was awarded to Norman Borlaug, the agricultural scientist who developed the new strains of wheat that augured the green revolution.

(www.cgiar.org/who/history/origins.html).

Famine in China

Despite advances like the green revolution, the world did not immunize itself from famine. As noted earlier, throughout its long history China has periodically been ravaged by famine on the order of one per year in one province or another.

Possibly the worst famine in history occurred between 1958-61 during China’s Second Five-Year Plan, self-styled the Great Leap Forward. Millions of peasants were forced off their land onto large collective farms or into small-scale iron and steel production facilities such as local communes with backyard furnaces. Communist Party Chairman Mao Zedong’s efforts at massive social and economic reform undermined labor availability and investment in agriculture, leading to smaller harvests. Drought and other adverse weather conditions compounded the problem.

The government suppressed news about the resulting tragedy. Government statistics inflated actual production levels while blaming any problems on the weather. Officially these were the Three Years of Natural Disasters. While in the countryside peasants starved, cities received their rations and industrial expansion continued. Only later did the world become aware that some twenty to thirty million people in rural areas may have lost their lives. (en.wikipedia.org/wiki/Famine. Also, Fairbank, John King. 1992:368-74). The mortality estimates have been criticized for faulty assumptions and lack of verifiable data but the scale of deaths was appalling whatever the actual number.

Since then a chastened Chinese government has adopted a more balanced and less ideological approach to agriculture. After 1979 collectivized farming was largely abandoned in favor of greater freedom for farm households. The government has invested substantially in water resources, land reclamation, and higher yielding seed varieties. It maintains large grain reserves and pursues other measures aimed at domestic food self-sufficiency. While China has been strongly interventionist in grain production and trade, it has been markedly more market-oriented with respect to non-grains like fruits, vegetables, livestock and fish. (Gill, Gerard J., et al., 2003: 25-26).

China was the most glaring example of failure in preventing famine but the record of the world in the twentieth century overall is not impressive. “From Nigeria in 1903 to North Korea in the late 1990s, 70 million people or more died of starvation, hunger-related disease or diseases to which they were exposed as a result of the famine process.” (Devereux, Stephen, 2000: 29). This in a period when more than enough food was produced to feed the world and the logistics for distributing food to the needy were in place.

While the risk of famine has receded in much of the world, countries in Africa— notably Ethiopia and Sudan—remain vulnerable, due mainly to drought and civil

conflict. Parts of southeast Asia, especially North Korea, continue to experience famine. To be sure there have been international anti-hunger initiatives but controversies over the best approach have hampered progress.

Freedom from Hunger Campaign

On July 1, 1960, the United Nations launched the Freedom from Hunger Campaign. Part of the first United Nations Development Decade and a signature initiative of B.R. Sen, FAO director-general (1956-1967), this five-year Campaign aimed at raising global awareness of hunger and malnutrition. Campaign committees were established in both developed and developing countries. The FAO and other United Nations agencies issued a series of studies in the following decade that helped shape national and international anti-hunger programs. (Shaw, D. John, 2007:77-81).

Food aid quickly became controversial. Theodore W. Schultz concluded that U.S. food aid, however well-intentioned, would depress the prices of farm products in recipient countries (notably India, whose situation he analyzed) and undermine their economic development. (Shultz, Theodore W., 1960).

Other criticisms have flowed subsequently. Food aid creates dependency among recipient governments and their populations. Almost a third of the aid resources are siphoned off by processors, shippers and other intermediaries. Locally food may be diverted from the intended beneficiaries by incompetent or corrupt officials. The system works more to the advantage of special interests in donor countries than to hungry people elsewhere.

Aid advocates counter that food aid is an effective response to crises. Emergency food aid constitutes half to two-thirds of all food aid. Food is less fungible than cash, so it is more likely to be used for the benefit of recipient households. If food aid were curtailed there is no assurance that its place would be taken by its equivalence in cash. The management of food aid programs has improved. Efforts are being made to offset the negative consequences of external food aid. (Food and Agriculture Organization, 2006:3-4).

World Food Program

The early successes of the green revolution in averting widespread starvation and death in Asia motivated the establishment of new research centers in the 1960s: International Center for Tropical Agriculture in Colombia (1967), International Maize and Wheat Improvement Center in Mexico (1966), International Institute for Tropical Agriculture in Nigeria (1967). But there were setbacks. Monsoon failures in the Indian sub-continent during the 1960s led to an unexpected increase in trade and a drop in exporting countries' grain stocks. The threat of shortages stirred concern about world food security.

In 1960, U.S. President Dwight D. Eisenhower proposed to the United Nations General Assembly that "a workable scheme should be devised for providing food aid through the UN system." (www.wfp.org/aboutwfp/history). The following year in April, at the Food and Agriculture Organization, the director of the U.S. Food for Peace Program, George McGovern, proposed an experimental three-year multilateral food aid program.

In September the UN General Assembly and the FAO approved parallel resolutions that established the World Food Program. In April 1962 the World Food Program's governing body held its initial session. Though planned as a three-year experiment,

events changed the agenda—a September 1962 earthquake in Iran, an October 1962 hurricane in Thailand and the need to resettle five million refugees in newly independent Algeria.

These crises required food aid and the new World Food Program provided it. In 1965 parallel resolutions at the Food and Agriculture Conference (December 6) and the UN General Assembly (December 20) declared that the World Food Program should continue in existence “for as long as multilateral food is found feasible and desirable.” (www.wfp.org/aboutwfp/history).

The World Food Program’s first executive director, Addeke Hendrik Boerma of the Netherlands, had aided in post-World War II reconstruction of the Dutch agricultural economy and held progressively higher positions in the Food and Agriculture Organization from 1948 to 1962. He served as World Food Program executive director from May 1962 to December 1967 at which time he returned to the FAO as its Director-General.

In 1962, a year after FAO launched a “Freedom from Hunger Campaign”, the German Committee for Freedom from Hunger with members from major German social organizations was set up at the initiative of Heinrich Lübke, Federal German President. In 1967 the committee was renamed “Deutsche Welthungerhilfe, e.V” (translated as German Agro Action). As a nonprofit organization it grew from carrying out four projects in 1968 to 325 projects in 2007. In the latter year it worked in seventy countries, mainly in rural Africa, Asia and Latin America. It has become one of Germany’s largest non-governmental organizations with a 2006 budget of 190 million euros. (German Agro Action, 2006. Also www.welthungerhilfe.de/430.html).

Food for Peace has lost some luster as direct food aid has declined and international attention has shifted to longer-range solutions to hunger, poverty and underdevelopment. But the program does exemplify America’s humanitarian concern for the less well-off and its readiness to assist with crisis relief. It became the springboard for larger, more coordinated international anti-hunger programs such as the UN’s World Food Program.

Despite direct food assistance and agricultural progress under the green revolution, famine broke out periodically in the 1950s and 60s, most tragically in China. The Food and Agriculture Organization mounted a Freedom from Hunger Campaign that stirred action in a number of countries. Direct food aid was never viewed as an unmixed blessing, as critics worried about its effects on small producers in recipient countries, local market prices and international trade. In addition to the amounts required to alleviate hunger, world bodies increasingly became aware of the need to improve food safety and quality.

VII. Research for Food Security

Codex Alimentarius

People everywhere expect the food they consume to be safe and of good quality. Codifying the rules for food production and distribution began early in history.

The ancient Assyrians set forth a method for establishing the correct weights and measures for grains. The Egyptians prescribed the labeling for certain foods. Athenian officials inspected beer and wine for purity and soundness. Romans had a well-organized consumer-protection food control system. In the Medieval Period, various European nations “passed laws concerning the quality and safety of eggs, sausages, cheese, beer, wine and bread.” Some are still in effect. (World Health Organization and Food and Agriculture Organization, 2006:5-6).

In 1953 the World Health Assembly, the highest governing body of the World Health Organization, expressed concern over the expanding use of chemicals in the food industry. A year later Austria began pursuing development of a European Codex Alimentarius. (World Health Organization and Food and Agriculture Organization of the United Nations, 2006: 8-9).

In 1963 the FAO and the World Health Organization created the Codex Alimentarius Commission to develop international food standards. The Codex Alimentarius (food code) has evolved into the main international reference point for the world’s principal foods—raw, processed, or semi-processed—in areas like quality, food safety, consumer health and fair trade practices. The goal is to protect consumer health and facilitate trade through the harmonization of international food standards.

The codes address hygienic and nutritional matters relating to microbiological norms, food additives, pesticide and veterinary drug residues, food product labeling, and methods of sampling and risk analysis. In addition to nonbinding standards for individual foods, the code includes more general guidelines, advisory standards of practice and other recommended measures. (www.who.int, www.unsystem.org/scn, www.wfp.org and www.unicef.org).

The Codex Alimentarius is referenced in regional trade arrangements under the 1993 North American Free Trade Agreement (NAFTA), the 1991 Treaty of Asunción which established MERCOSUR, a South American common market, and the 1993 Asia-Pacific Economic Cooperation (APEC) grouping, as well as a host of bilateral and plurilateral agreements. High on the Commission’s current agenda is the application of biotechnology to the production and processing of food.

The Food and Agriculture Organization and the World Health Organization help developing countries in applying the codes, conducting risk assessments, strengthening food control systems and taking advantage of international food trade opportunities.

World Food Congress

In preparation for a World Food Congress, a Special Assembly on Man's Right to Freedom from Hunger was convened in Rome March 14, 1963. This Assembly was attended by 29 internationally respected individuals, including several Nobel Prize winners. The Assembly’s Manifesto opened World Freedom from Hunger Week, March 17-24. (www.fao.org/docrep/f3200e/f3200e01.htm#TopOfPage)

In June 1963, at the World Food Congress in Washington, DC, delegates called for creation of an international institute for agricultural development and planning as a

step toward ridding the world of hunger. (Shaw, D. John, 2007:81-84. Also see Section X-A, Report of the Conference of FAO, Twelfth Session, Rome, November 16-December 5, 1963. www.fao.org/docrep/x5571E/x5571e00.HTM)

In 1964, the United Nations Conference on Trade and Development was established as an organ of the UN General Assembly. It focused on the problems of developing countries, especially those susceptible to deteriorating terms of trade. Since GATT was judged to be paying only half-hearted attention to the problem, there were calls in UNCTAD's quadrennial conferences for establishment of a permanent international trade organization as had been proposed by the Bretton Woods conferees.

Food Aid in Decline

Throughout the 1950s, 1960s and 1970s there was international concern that people in many developing countries would succumb to famine. In 1970, over 900 million people around the world suffered from malnutrition. That figure began to drop thereafter, thanks in no small part to the green revolution.

The Ford and Rockefeller Foundations were not in a position to support their network of agriculture research centers indefinitely. They along with the World Bank, Food and Agriculture Organization and the United Nations Development Program sponsored a series of consultations between 1969 and 1971. Held mostly in Bellagio, Italy, the consultations are known collectively as the Bellagio Conferences. These were designed to share scientific results, push for the continuation and expansion of international agricultural research, settle on the appropriate institutional mechanisms and attract donor support.

In 1967, within the framework of the International Grains Arrangement (not part of the UN system), eleven countries and the European Community signed the first Food Aid Convention. This committed its signatories to providing a minimum level of food aid, originally set at 4.06 million metric tons.

The signatories were Argentina, Australia, Canada, Denmark, Finland, Japan, Norway, Sweden, Switzerland, United Kingdom, United States and the European Community on behalf of its member states. The Convention was renewed with modification in 1971, 1980, 1986, 1995, and 1999. The latter was due to expire in 2002 but was initially extended through 2007 and thus far on a yearly basis since. (Hoddinott, John and Cohen, Marc C., 2007:1-3).

Since 1970, "food aid has fluctuated between 6 and 17 tonnes a year" or between \$750 million to \$2.5 billion in non-inflation-adjusted dollars. (Food and Agriculture Organization, 2006:10). The importance of food aid has declined so that today it makes up less than five percent of all aid. Cereals make up the largest component of food aid but their volumes vary due to shifts up or down in prices, harvest yields and surpluses available for export. (ibid.)

Establishment of CGIAR

In 1971 the Consultative Group on International Agricultural Research (CGIAR) was established through the leadership of the World Bank (which had created analogous "consultative groups" in other areas) and with the co-sponsorship of the FAO and the United Nations Development Program. Now the world's largest research consortium, this partnership among sixty-four countries, regional and international organizations and private foundations works to achieve sustainable food security and poverty reduction in developing countries. While the CGIAR did not initiate the green revolution it was indispensable in extending and sustaining it.

Through its network of fifteen centers, CGIAR conducts research and research-related activities in agriculture, forestry, fisheries and the environment. Eleven centers maintain international genebanks with nearly 700,000 samples of crop, forage and forestry genetic resources. Seed contributions from these banks have helped revive agriculture in conflict-torn countries like Afghanistan, Angola, Mozambique, and Somalia as well as others recovering from natural disasters like 1998's Hurricane Mitch in Honduras and Nicaragua which ended more than ten thousand lives.

Of some one million seed samples distributed from CGIAR genebanks over a ten year period, at least four-fifths went to universities and national agricultural research systems for development of new pest-, disease- and climate-resistant crop varieties that require less water and fertilization but promise greater yields and nutritional value. In 2006 the genebanks' seed collections were placed under the purview of the International Treaty on Plant Genetic Resources for Food and Agriculture. (www.cgiar.org/impact/genebanksdatabases.html. Also Varma, Surendra and Winslow, Mark, 2004).

With the emergence of national agricultural research institutions in countries like Brazil, China, India and South Africa, the role of CGIAR is less clear. It has been less sought after as a source of solutions for agricultural productivity, natural resource management and policy advice. Funding is not keeping pace with client needs. In 2008, CGIAR approved major structural changes that aimed at transforming the organization from a loose consultative system of donors and independent research centers to a tighter one based on contractual relationships, performance and accountability. (Consultative Group on International Agricultural Research, 2008).

VIII. Two Dreadful Years

A Disastrous Harvest

A food emergency erupted between 1972 and 1974. In 1972, the major food exporters, the United States and Canada, took land out of production to reduce their massive farm surpluses. In 1973 the Organization of Petroleum Exporting Countries (OPEC) suspended the export of oil to countries that had supported Israel in the Yom Kippur War. The global economy went into a tailspin.

In a year the price of oil went up fourfold. In the United States drivers waited in long lines for gas. Obtaining oil became a strategic necessity. OPEC raised oil prices, thereby making the production and transportation of fertilizer more costly. This especially hurt agriculture-dependent developing countries.

At the same time the Union of Soviet Socialist Republics (USSR) suffered a disastrous harvest, forcing it to import some 28 million tons of grain. One of the world's largest oil producers, the Soviet Union sold its oil to the United States in exchange for surplus wheat stocks that otherwise would have gone to developing countries.

World grain stocks fell and prices soared. Developing countries borrowed heavily to cope with their own demand for imported oil. From whom did they borrow? The newly flush OPEC countries. By the end of the 1970s, rising interest rates and a global recession pushed many developing countries into unsustainable debt. (Patel, Raj, 2007:91-93).

While food production in developing countries like India had been increasing, thanks in large part to the green revolution, it was not keeping pace with population growth. In countries of sub-Saharan Africa, production stagnated. Production of wheat, coarse grains and rice fell some 55 million metric tons below world demand. Cereal production declined by about three percent in circumstances where world demand required an increase of two percent. To meet demand, the exporting countries tapped into their food stocks, thus depleting carryover inventories. Accordingly, food aid supplies were cut back.

Cereal prices rose along with oil prices, leaving food-deficit countries in financial straits. All these factors combined to create a "perfect storm"—an immediate crisis in food deficit countries and widespread fears of famine. Despite good harvests in 1973 and 1974, the effects lingered: food shortages contributed to the deaths of half a million people in the period. (Shaw, D. John, 2007:115-118).

The UN's Response

These conditions spurred international action. In an address to the UN General Assembly, September 24, 1973, U.S. Secretary of State Henry Kissinger proposed the organization of a World Food Conference to deal with the "threat to the world's food supply." (Shaw, D. John, 2007:121). The World Food Conference held November 5-16, 1974 in Rome was attended by ministers representing 134 governments.

A recommendation by the Preparatory Committee to establish a United Nations World Food Authority on a par with the UN Security Council was rejected in favor of a weaker body, the World Food Council. Essentially this reflected a preference for voluntary international coordination over food supply issues without sacrifice of national sovereignty instead of more formal international control.

The Conference resolutions led to the creation of a new body, the International Fund for Agricultural Development. (Kennedy, Paul, 2006:154). A Committee on Food

Security was set up at the Food and Agriculture Organization and the governing body of the World Food Program was reconstituted. The World Food Program's Intergovernmental Committee was converted to the Committee on Food Aid Policies and Programmes.

Under a 1991 decision, the number of Committee member states was increased from 30 to 42, effective January 1, 1992. In 1996, the number was set at 36, half of whom are elected by the UN's Economic and Social Council and half by the Council of the Food and Agriculture Organization. Terms are for three years with the possibility of re-election. (www.wfp.org/aboutwfp/history.) The Conference also endorsed FAO's efforts to upgrade its data collection, weather monitoring (in conjunction with the World Meteorological Organization) and early warning systems.

The World Food Summit (November 13-17, 1996) convened by the Food and Agriculture Organization produced a "blueprint" (officially, the Rome Declaration and Plan of Action) for achieving the goal of cutting in half by 2015 the number of the world's undernourished people. The FAO had begun working with civil society and nongovernmental organizations shortly after its creation in 1945. These ties expanded and deepened during the Freedom from Hunger campaign, which stitched together national, regional and international networks of non-governmental organizations. About five hundred civil society organizations attended the 1996 Conference while a separate parallel non-governmental forum pulled together some 1300 organizations. This broad-based collaboration led to initiatives such as food sovereignty and a code of conduct on the right to food.

The Summit had important follow-on effects in the relationship between the United Nations system and non-state entities, the role of the later having mushroomed within the UN's global governance responsibilities. (www.fao.org/tc/ngo/history_en.asp)

Bread for the World

In 1972 a small group of Catholics and Protestants in the United States met to consider how people of faith could combat world hunger. Led by Reverend Arthur Simon, the group tested its ideas in early 1974 after reading reports from the World Food Conference. By the end of that year over five hundred people had joined Bread for the World as advocates for hungry people. The organization acts as a collective Christian voice urging U.S. leaders to end hunger at home and abroad.

In 1991 Reverend Simon was succeeded by former World Bank economist and current Lutheran pastor Reverend David Beckman. He is also president of Bread for the World Institute, the research and education arm. The Institute organized the U.S. Alliance to End Hunger. With some 57,000 members and 2,500 congregations, Bread for the World has become one of the world's largest organizations focused on mobilizing the political will to end global hunger. (Beckman, David, 2005). It participates in the Roadmap to End Global Hunger Coalition.

Food Financing Facilities

Food price and supply issues began to ease in 1975. The International Wheat (later, Grains) Council sought to moderate future fluctuations in grain prices. Established in 1942, its members were Argentina, Australia, Canada, United Kingdom and the United States. While seeking to build grain reserves to cope with production shortfalls, the United States was wary of government intervention in markets. It

avored increased production in developing as well as developed countries as the path to food security. This stood at odds with the European Economic Community which sought high price supports (essentially international subsidies) for its agricultural markets. No agreement was reached.

The 1970s food crisis led the International Monetary Fund to create new “facilities” to assist food-deficit countries facing adverse terms-of-trade and food import issues. Although a Compensatory Financing Facility, Compensatory and Contingency Financing Facility and Food Financing Facility were opened, in practice little use was made of them by borrowing countries. (Barrett, Christopher B., 2002).

A similar fate met the European Community’s related STABEX, a compensatory financing facility created in 1975 and designed to stabilize the fluctuating revenue from agricultural exports in African, Caribbean and Pacific (ACP) countries. (www.acpsec.org/summits/gabon/koebler.htm).

The 2000 Cotonu Agreement, which succeeded the earlier Yaoundé Agreements and the Lomé Conventions, promoted partnership, trade and mutual obligations between the European Union and ACP countries. (Yaoundé is the capital of Cameroon, Lomé the capital of Togo and Cotonu the capital of Benin.) Cotonu was signed by representatives of 78 ACP countries and 15 EU countries. The Agreement gives the member countries trade priorities to enter the European market, the second largest in the world. STABEX was abolished under the Agreement in order to reinforce a free trade approach. (en.wikipedia.org/wiki/Cotonou_Agreement).

In China market-oriented agricultural reforms led to dramatic progress against hunger and poverty. In 1978, the state permitted families to lease land from collective farms and at the same time raised its prices for food grains, oil crops and hogs. Farm incomes rose almost immediately and rural non-farm enterprises expanded. Based on the World Bank’s \$1-a-day poverty threshold, the number of poor people dropped from 490 million in 1979 to 90 million in 2002. The number of malnourished dropped from 387 million in 1969-71 to the current 150 million. (Food and Agriculture Organization, 2006:16).

World Employment Conference

In 1976 the International Labor Organization convened the Tripartite World Conference on Employment, Income Distribution and Social Progress and the International Division of Labor, better known (happily) as the World Employment Conference. The conference linked employment with a country’s ability to meet basic needs like food, shelter, and clothing as well as the provision of essential services that included safe drinking water, sanitation facilities, transportation, health care, education and cultural activities.

The approach did not lack for skeptics. The U.S. representative differed with the Conference Report’s emphasis on employment creation as a way to meet basic needs; it smacked too much of redistribution and not enough of growth. Less predictably the G77, the United Nations largest coalition of developing nations, concurred. Rather than employment creation, the G77 gave pride of place to structural reforms and technological progress as key to their participation in a new international economic order.

The focus on food as a basic need gave weight to calls for rural as well as urban development and emphasis on agriculture as well as industry. However, the basic needs approach was disparaged by critics as a diversion by which developing countries would simply redistribute their meager assets while developed countries lengthened

their economic lead through growth-oriented strategies. (Shaw, D. John, 2007:225-228).

In 1976 Edouard Saouma of Lebanon succeeded Addeke Boerma as director-general of FAO. Saouma, an agricultural engineer, was founder and director of Lebanon's Agricultural Research Institute; he served as Lebanon's minister of agriculture, fisheries and forestry and subsequently held top level positions in FAO over fourteen years before his election as director-general.

His aggressive support of third world countries often put him at odds with major donors like the United States. He was accused of a dictatorial management style, of embracing a "collectivist ideology" that resisted cooperation with private industry, particularly multinational corporations, and of favoring government management of farming over free market agricultural policies. (Pilon, Juliana Geran, 1988).

Despite or because of such criticism, Saouma remained popular with the developing world. During his eighteen year tenure FAO established a technical cooperation program (1976) to provide emergency and short-term assistance to developing countries, completed the fourth world food survey (1978), secured adoption of the World Soil Charter (1981) aimed at protecting soils and preventing desertification, helped create the International Commission on Plant Genetic Resources (1983), held the first world conference on the improvement and management of fisheries (1984), and co-sponsored with the World Health Organization the first world nutrition conference (1992).

International Fund for Agricultural Development

Pursuant to a decision of the 1974 World Food Conference, the International Fund for Agricultural Development (IFAD) was established formally on November 30, 1977 as a specialized agency of the United Nations. The Fund was designed to promote "food security and the livelihood and well-being of the rural poor, in particular the poorest rural groups in the poorest, food deficit countries." (International Fund for Agricultural Development/Office of Evaluation, 2005:12).

Initial financing of \$1 billion, to be replenished every three years, was provided jointly by the Organization for Economic Cooperation and Development (OECD) and the Organization of Petroleum Exporting Countries (OPEC). IFAD is small compared to other international lending programs. At \$424 million, its approved loans in 2003 were about two percent of the World Bank's. (International Fund for Agricultural Development/Office of Evaluation, 2005:22). IFAD operates as an independent financial institution, supporting agricultural and rural development projects primarily through loans on concessional terms and to a lesser extent grants. IFAD itself is funded by periodic replenishments (contributions) from member states, equity and loan repayments.

According to IFAD's official lending criteria, the poorest countries are those whose per capita annual income is below \$500 (1975 dollars); who have a projected cereal deficit by 1985 of 500 thousand tons and/or a cereal deficit of twenty percent or more of projected cereal consumption; and who have a high proportion of the population with protein-calorie malnutrition. (International Fund for Agricultural Development, 2005:23fn).

IFAD's special highly concessional loans have a forty year maturity period with a ten year grace period, all with no interest but an 0.75% annual service charge. Intermediate loans are for twenty years with a five year grace period and an annual interest rate set at half of a variable reference interest rate (the latter as determined

by IFAD's executive board). Ordinary loans are made for a 15-18 year period including a three year grace period and an annual interest rate set at the full variable reference interest rate. (International Fund for Agricultural Development, 2007: 169).

The Fund's objectives are to enhance the capacities of the rural poor, improve nutritional levels, increase the use of productive resources and technology, expand access to markets and financing, promote gender equity and cultural diversity and enable poor rural communities to cope more effectively with crisis situations. The loan portfolio is less target-efficient than the formal criteria would suggest (International Fund for Agricultural Development/Office of Evaluation, 2005:39).

Over time, as the Fund gained experience, its mission broadened to incorporate the goal of rural development and poverty alleviation. Its portfolio expanded to include support for "fisheries, small scale irrigation, marketing, storage, processing, entrepreneurial capacity, and rural micro-enterprise." (International Fund for Agricultural Development, 2005:19). The Fund had evolved from being a financing facility to a development organization.

Although its focus on rural poverty reduction distinguishes the Fund within the international system, like other aid-oriented organizations it has struggled to stay relevant within an ever-changing global setting. Rural areas are heterogeneous and the notion of development has evolved from its early focus on food production to expanding the array of rural livelihoods.

The disastrous years of the early 1970s brought home the reality of periodic threats to the world's food supply. Nongovernmental organizations advocated for an end to global hunger. The International Monetary Fund eased financing requirements for food deficit countries, though its facility and a related European one were rarely used.

The European Union worked out two-way preferential trade agreements with agriculturally-oriented African, Caribbean and Pacific countries. China adopted market oriented reforms in agriculture. The international community's goal of meeting basic needs, one of which is food, gave greater weight to rural as distinct from urban development and agriculture along with industry. Within the UN, the International Fund for Agricultural Development was established to support agricultural projects and rural development in poor countries.

Direct food aid as a solution to global hunger dropped lower on the world's list of priorities.

IX. The Reform of Food Aid

In the last half of the twentieth century, agrarian reform was perceived as key to rural development in poor countries. In 1979, FAO convened a World Conference on Agrarian Reform and Rural Development, attended by representatives of 145 governments. World Food Day, established in 1979, is held each year on October 16 in one hundred fifty countries on October 16, the anniversary of FAO's founding in 1945.

The Conference's Declaration of Principles and Program of Action, better known as *The Peasants' Charter*, emphasized equity as well as growth. It stressed the role of rural people in the development process as well as reform in agrarian practices, land tenure and land settlement. "Participation by the people in the institutions and systems which govern their lives is a basic human right and also essential for realignment of political power in favour of disadvantaged groups and for social and economic development." (www.fao.org/docrep/u8719e/u8719e00.htm).

Subsequently FAO helped establish three regional centers to help implement the program of action at the national level. These were the Centre on Integrated Rural Development for Asia and the Pacific in Dakha, Bangladesh; the Centre on Integrated Rural Development for Africa in Arusha, Tanzania; and the Centre for Agrarian Reform and Rural Development for the Near East in Amman, Jordan.

Plant Genetic Resources

By the early 1980s, the World Food Program was established in 114 countries. By this time the emphasis had shifted away from supplying schools and communities with surplus food to providing emergency food aid. The former approach harmed the livelihoods of local farmers without achieving long-term reduction in hunger and malnutrition.

In 1983 the FAO Conference established the Commission on Plant Genetic Resources. In 1995, it was renamed the Commission on Genetic Resources for Food and Agriculture and its mandate broadened to cover all components of agrobiodiversity relevant to food and agriculture. The Commission is a permanent forum where members negotiate issues pertaining to genetic resources for food and agriculture. Its membership stands at 168 countries.

The 1985 FAO General Conference adopted a strategy for fisheries management, a code of conduct for pesticide distribution, a compact on world food security, and a tropical forestry plan. It also provided for a world census of agriculture which was carried out in 1990.

Cairns Group

Below average rainfall over a seventeen-year period contributed to a massive famine in Sub-Saharan Africa from 1984 to 1986. A 1986 World Bank report stressed the link between food insecurity and poverty; it also distinguished between chronic and transitory insecurity, a popular distinction among academic and policy analysts alike. The solution was long-term economic growth combined with short-term redistribution programs to increase purchasing power and access to food among the poor. (World Bank, 1986)

In August 1986, at a meeting in Cairns, Northern Queensland, Australia, ministers from several agricultural exporting countries formed an alliance to assure that trade issues around agriculture would be given a high priority during multilateral trade

negotiations. The influence of the Cairns Group was felt when GATT members agreed a month later to negotiate on agriculture during the Uruguay Round.

Essentially the Cairns Group, whose members are diverse, share the objective of liberalizing trade in agriculture. The current members are Argentina, Australia, Bolivia, Brazil, Canada, Chile, Colombia, Costa Rica, Guatemala, Indonesia, Malaysia, New Zealand, Pakistan, Paraguay, Peru, Philippines, South Africa, Thailand, and Uruguay. This nineteen-member roster accounts for a quarter of the world's agricultural exports.

The advantages of developing countries in lower wages and favorable climates have been offset by farm-sector support schemes in Japan, the European Union and the United States. From its inception, the goal of the Cairns Group has been to roll back agricultural trade barriers in favor of a fair and market-oriented trading system. The Group seeks deep cuts to all tariffs, no tariff escalation, and elimination of trade-distorting domestic and export subsidies. (www.cairnsgroup.org).

As emphasized in its Vision Statement, "Food security will be enhanced . . . as more farmers, including poorer farmers in developing countries, are able to respond to market forces and new income generating opportunities, without the burden of competition from heavily subsidised products."

(www.cairnsgroup.org/vision_statement.html).

World Summit for Children

On September 29-30, 1990, the United Nations hosted the World Summit for Children. At the Summit, 71 heads of state and 88 other senior officials signed a World Declaration on Survival, Protection and Development of Children. (www.unicef.org/wsc/declare.htm). An accompanying plan of action specified time-bound goals that included bettering living conditions for children through access to health care, reducing the spread of preventable diseases, expanding educational opportunities and improving sanitation and the availability of food supplies. Specific goals related to our present topic were the reduction of severe and moderate malnutrition among under-5 children by one half of 1990 levels, universal access to safe drinking water and universal access to sanitary means of excreta disposal.

Food Aid and Donor Fatigue

Despite these initiatives the latter half of the 1980s witnessed a drop in food aid. This was due principally to three factors. The end of the Cold War reduced the bidding by superpowers for developing countries' support. The Uruguay Round of GATT limited the extent to which subsidized agricultural commodities could be exported. And donor fatigue had set in, as questions persisted over the effectiveness of foreign aid in all its forms. Donor countries' commodity surpluses declined.

The available food aid shifted more to emergencies than development. In this "safety net" capacity, international organizations like the World Food Program focused on early warning systems, better coordination among donors, and more timely distribution of deliveries with more complete coverage. Where possible, international organizations purchased surplus food within developing countries themselves for distribution to distressed areas either in those countries or elsewhere. (Barrett, Christopher B., 2002:48).

With international organizations as facilitators, developing countries could more easily help one another in cases where, say, one country enjoyed a good harvest while a neighbor experienced drought, flooding or other shocks to the agricultural system.

For example, in the mid-1980s, under a so-called triangular transaction, the United States, Japan and Australia donated wheat to Zimbabwe in exchange for maize surpluses that were delivered to Mozambique and other southern African nations. (Barrett, Christopher B., 2002:48).

In 1984-85 Ethiopia was hit by famine following three successive years of drought. At the time the government was battling insurgencies in all fourteen of its administrative districts. Approximately a million people died among the nearly eight million victims of famine. Western aid was slow in coming to a professed Marxist state and the Ethiopian government was condemned universally for its spending on military operations and withholding of food shipments to rebel areas.

Eventually, due largely to dramatic media attention and a televised Live Aid concert viewed by hundreds of millions of people worldwide, the scale of the disaster was brought home and food aid began to reach the affected areas.

UNICEF administered cash for food in selected drought-stricken parts of Ethiopia. With monthly payments from authorized representatives and peasant associations, some 95,000 beneficiaries were able to obtain food in local markets rather than travel to distant food distribution centers. Program sites were selected in part for their proximity to areas with marketable surplus production.

Cash payments induced an inflow of food from those surplus areas at reasonable prices. Surprisingly, anywhere from a quarter to a third of the cash “was spent on non-food items such as clothes, animals, seeds and tools, as well as land taxes, dues to peasant associations, and debt repayments.” (Peppiatt, David; Mitchell, John; and Holzmann, Penny, 2001:6).

Either people were not as badly off as expected—or they endured malnutrition in order to sustain their productive assets and community ties. The cash for food program did not achieve long-term food security but it offered immediate relief while enabling beneficiaries to determine their own food versus non-food needs. Cash introduced an element of consumer choice.

The Rio Summit

The theme of land reform was included in the 1992 UN Conference on Environment and Development, held in Rio de Janeiro. Also known as the Rio Summit or Earth Summit, it was attended by representatives of 178 countries, including 118 heads of state.

This heavily attended Summit climaxed a three-year process of negotiation among member states. Literally thousands of non-governmental organizations participated in the conference and at a parallel Global Forum. The Rio Declaration on Environment and Development and a parallel document, Statement of Principles for the Sustainable Management of Forests, both mercifully short, made up Agenda 21. Women, indigenous and local communities were highlighted as having a “vital role” in sustainable development. (www.unep.org/Documents.Multilingual/Default.asp?DocumentID=78&ArticleID=1163)

In December 1992 the Commission on Sustainable Development was created to monitor the follow-up to the Rio Summit. Although much of Agenda 21 was honored in the breach, the Rio Summit has influenced subsequent United Nations deliberations on human rights, population, social development, women, human settlements and environmentally sustainable development. It has given rise to the term “green economy” to underscore the types of actions that must be taken as the environment nears its carrying capacity.

Alternatives to Emergency Food Aid

The effectiveness of international food aid has been the subject of ongoing debate. While food aid is a small fraction of the global economy, clearly it has met emergency needs, for example, providing about 70 percent of consumption during the 1992-1993 civil war in Somalia and a third of consumption during 1997-1999 mass killings in Rwanda. Other countries relying on emergency food aid in the 1980s and 1990s included Afghanistan, Eritrea, Ethiopia, Haiti, North Korea, and Sudan. In Mozambique, during the 1992-1993 drought, yellow maize brought in as food aid “supplied about 60 percent of total cereal availability.” (Food and Agriculture Organization, 2006:13).

On the positive side aid augmented supply and improved access to food staples; on the negative, it contributed to local price declines, production disincentives and government dependence on the world community.

In 1994, in response to declining agricultural productivity, irregular rainfall and increased population density, ActionAid, through its Food Security Programme, made one-time cash transfers to a thousand vulnerable households in Ghana’s Bakwu West District. The poorest recipients, or *tarims*, liked having control over the money.

Buying food in local markets or at grain banks enhanced their participation in community life and gave them a greater sense of self-worth. Most of the cash went for food (though a portion was spent by some male *tarims* on livestock or other income generating activities) and food security was enhanced. (Peppiatt, David; Mitchell, John; and Holzmann, Penny, 2001:7).

Within developing countries food subsidies to consumers can compensate for job loss or rising prices and arrest a deteriorating standard of living. But at a cost. Long-term subsidies retard economic growth. They distort investment priorities, drain government revenues, artificially keep food prices low, engender inflationary pressures on non-food items, penalize small farmers and foster social tensions between the subsidized and the non-subsidized.

Ideally consumer food subsidy programs would be creatively designed, targeted precisely on the neediest, skillfully managed with low overhead costs, data-driven with appropriate feedback and subject to rapid phase-out once basic food needs have been met. This is a lot to expect in a developed let alone a developing country. It is no shock to find the polar opposite in many countries.

Food subsidy programs have frequently labored under high overhead costs, lack of valid and reliable data, administrative corruption, disproportionate subsidies for the more well off and program perpetuation without evidence of commensurate need. As developing countries privatize their economies, the injection of donated food supplies (or other commodities) can disrupt domestic markets.

Disenchantment with food aid writ large has had an effect. “The overall level of food aid trended downward after 1991 and covered less than 60 percent of consumption shortfalls from 1991-2000.” (U.S. Department of Agriculture/Economic Research Service, 2004:7-8). However, unfettered market economies do not inevitably benefit the poor. Local farmers may demand prices for food that lie beyond the reach of the country’s poorest and hungriest. This is particularly true in countries with high unemployment and domestic instability.

Over the past thirty years, there has been an expansion of capital-intensive, profit-driven agribusiness. Agriculture and farm-related activities are being

dominated by large transnational firms and conglomerates. Size, concentration and multi-nationalism threaten to dwarf community-based infrastructures in developed and developing countries (e.g. family farms, local marketing cooperatives). The prospects for biotechnology and the focus on intellectual property rights are spurring private sector research, proprietary science and the concentration of seed and chemical businesses under huge conglomerates.

Fundamentally a balance is needed between market-based economic growth and individual entitlement to essential nutrients. In general international food aid and domestic consumer subsidies seem better suited to short-term needs rather than long-term development.

X. The Forgotten Goal

Brazil

With a population of 170 million and a 2002 per capita income of \$3,300, Brazil is a lower middle-income country. Despite an improving agricultural sector and sufficient food availability at the national level, a quarter of the population has limited access to food. This is due mainly to extreme income inequality. In 2002, Brazil's richest quintile had 64 percent of the national income while the poorest had 2.2 percent. (U.S. Department of Agriculture/Economic Research Service, 2004:24).

For more than half a century Brazil has implemented a series of food assistance and antipoverty programs. These programs focused on human resource development, pensions, health, education, sanitation, housing, peasant agriculture, rural development and income transfers.

In the last half of the 1990s, there were initiatives such as the Alvorada project to reduce urban poverty, the Community Solidarity program and Bolsa Familia, a cash transfer program linked to children's school attendance. (U.S. Department of Agriculture/Economic Research Service, 2004:26). In 2003, newly elected President Luiz Inácio Silva launched a Zero-Hunger Program. Consisting of some sixty different initiatives, it aimed to improve food access for 11.4 million families.

Not Just Hunger But Malnutrition

An International Conference on Nutrition was convened by FAO and the World Health Organization December 1-3, 1992. Attended by representatives from 159 countries and the European Community, 16 UN organizations and 144 non-governmental organizations (NGOs), this was the first global conference to focus on the world's nutrition problems.

(www.fao.org/docrep/V7700T/v7700t02.htm#TopOfPage).

The conference went beyond food security (a sufficient amount of food) to address nutritional well being (the quality, value and safety of food). Thus malnutrition included not only too little food but also too much food without essential micronutrients.

Lack of iron, affecting two *billion* people, leads to anemia and in turn to maternal hemorrhage, reduced school performance, and capacity for work. Public health measures fostering consumption of iron-rich foods, food supplements and food fortification are needed, particularly in Africa and Asia. Iodine deficiency impairs children's cognitive development. One cheap source of iodine for developing as well as developed countries is iodized salt.

Vitamin A deficiency is a leading cause of blindness. Between one-quarter and one-half a million children become blind every year due to Vitamin A deficiency. Breastfeeding, food supplementation and food fortification are ways of assuring adequate intake of Vitamin A.

Zinc is essential for gene expression and cell development. Zinc deficiency hampers growth rates and increases child deaths from diarrhea, pneumonia and malaria. Regrettably there are few policies or programs aimed specifically at reducing zinc deficiencies globally. (www.who.int/nutrition/topics/en/).

The Nutrition Conference espoused nine principles: incorporation of nutritional objectives into development plans and programming, improvement in household food security, improvement in food quality and safety, control over infectious diseases, promotion of breast-feeding, care for the nutritionally and socio-

economically disadvantaged, elimination of micronutrient deficiencies (e.g. iron, iodine, vitamin A, zinc), promotion of better diets and healthier lifestyles, and monitoring and analysis of nutrition situations. (ibid.)

Severe malnutrition disrupts a child's metabolism and remains a major killer of children under five. Some twenty million children, most living in South Asia and sub-Saharan Africa, are severely malnourished. Action Against Hunger or Action Contre la Faim (ACF), a non-governmental organization very experienced in running feeding programs, was founded in 1979 in France in response to conditions in Afghanistan. It provides food and nutrition programs, safe drinking water, sanitation systems and hygiene services in over forty countries.

In 1994 Action Against Hunger pioneered a specially medicated milk-based formula known as F100 to nurse such children back to health. The ACF International Network (ACF-IN) has established headquarters in Paris, Madrid, London, New York and Montreal. ACF's International Scientific Committee, which disseminated the F100 formula, helps improve existing nutritional programs through sharing advances in nutrition research. (www.aah-usa.org/who-we-are/scientific-committee).

It is credited with reducing child mortality from severe malnutrition from over 25 percent to less than five percent. It has given rise to other ready-to-use therapeutic foods (RUTF)—soft or crushable dry foods with high energy content and fortified with vitamins and minerals—that can be given to children at home rather than (as with F100 milk) at hospitals and clinics. (World Health Organization/World Food Programme/United Nations System Standing Committee on Nutrition/United Nations Children's Fund, 2007). Because of possible safety concerns (e.g. dehydration), a World Health Organization Consultation recommended that, pending much needed observational research and randomized trials, children under six months should be given the F75 formula during the stabilization phase and only switched to F100 in the rehabilitation phase. (World Health Organization, 2005:12).

In Pursuit of Food Security

On November 30-December 1993 the World Bank held a World Conference on Overcoming Global Hunger at American University, Washington, DC.

In 1994, the Food and Agriculture Organization launched the Special Program for Food Security. Aimed at developing countries with significant food deficits, the program focused initially on small farmers. The idea was that through adoption of low-cost, sustainable technologies, small farmers could increase their productivity, better their livelihoods, improve local economies and generate surpluses. The program stressed participatory processes that aided farmers in diagnosing their problems, adopting appropriate remedial measures and gaining a voice in public policy forums.

The World Food Council was disbanded in 1993, victim of an overly broad mandate without commensurate authority or resources, lack of tight focus on selected key issues, and pressure from member nations for cost-cutting and consolidation within the UN system.

Over its nineteen-year existence, the Council could claim some success. For example, as a politically oriented ministerial body, it had supported creation of the International Fund for Agricultural Development, a cereal financing facility under the International Monetary Fund, and an international emergency food reserve. It highlighted the special food needs of Africa and developed the notion of national food strategies. In such ways, it "helped shape and promote an effective hunger-focused

world food policy. . . .” (Shaw, D. John, 2007:210).

The World Food Program

In December 1994 the World Food Program adopted a formal mission statement, the first in the UN system. Its goal is to meet emergency food needs and use food aid to support economic and social development. (www.wfp.org/policy-resources/index.asp?section=6&sub_section=1). This means providing food to save lives in emergency situations, improving nutrition and the quality of life of poor and vulnerable people and promoting community-based development particularly through labor-intensive work programs.

Whereas individual donor countries—most prominently, the United States—may use food aid to draw down farm surpluses, promote certain food exporters or reward loyal allies, the World Food Program as an international organization can focus on food security unencumbered by such political and diplomatic considerations. (Barrett, Christopher B., 2002:47).

No single entity can encompass all aspects of malnutrition and underdevelopment. The World Food Program seeks to mesh its assistance with the food security plans and programs of recipient governments. It coordinates with other UN agencies like the Food and Agriculture Organization and the International Fund for Agricultural Development, as well as the World Bank, International Monetary fund, donor governments, and non-governmental organizations.(ibid.).

About seventy percent of WFP food aid is aimed at crisis relief with the remainder supporting economic and social development. The program depends on voluntary contributions, both cash and non-cash, for its projects. In 2004, it drew upon \$3.2 billion as it managed half of the world’s food aid distribution.

At Last, a World Trade Organization

By the 1990s the world’s trading system had become so complex and interdependent that the need for a permanent rules-based body with appropriate jurisdiction was too compelling to be ignored any longer. The Uruguay Round, which actually concluded in Marrakesh, Morocco, produced a set of agreements that in effect constituted the World Trade Organization. (Griesgaber, Jo Marie and Bernhard C. Gunter, editors, 1997: xv-xvii, 19).

Agreement Number 2 covered agriculture. Among other matters, it moderated the effects of exchange rate variations on the prices of agricultural imports. One of the agreements was the Agreement on Agriculture. The deal was finalized with the signing of the Marrakesh Declaration on April 15, 1994 by most of the participating 123 ministers.

The WTO itself was formally established on January 1, 1995. Its mission is to use trade as a vehicle to raise living standards, ensure full employment, increase real incomes, boost effective demand, and expand the production and trading of goods and services. It operates within a framework of sustainable development that preserves the environment and fosters low income countries’ participation in global economic growth. (Agreement Establishing the World Trade Organization, April 15, 1994). The Agreement supersedes any conflicting multilateral trade agreements. (www.wto.org/english/docs_e/legal_e/04-wto.pdf).

Along with the World Trade Organization, the world has seen the rise of regional trade groupings, notably the European Union (EU), North American Free Trade

Agreement (NAFTA), Association of Southeast Asian Nations (ASEAN), South Asian Association for Regional Cooperation (SAARC), Common Market of the South (MERCOSUR) and Australia-New Zealand Closer Economic Relations Agreement. Over two hundred such groupings are in force with others in the making.

Structural Reform at FAO

Since 1994, the Food and Agriculture Organization has been undergoing major structural reform. Its goal is to decentralize activities, reduce expenses and streamline procedures. It is focusing more intensively on food safety, greater involvement of the private sector and civil society, and improved access to its databases.

The number of countries participating in FAO's Special Program for Food Security grew from fifteen in 1995 to over seventy by 2002. Local accomplishments in controlled water use, crop intensification and farming systems diversification remained just that—local. Successful pilot projects were widely admired but infrequently emulated. Host governments however failed to scale up successful pilot projects to national coverage; they would or could not make the necessary policy and institutional reforms. Additionally, relatively low priority was given to hunger reduction and rural development by international donors, who favored industry over agriculture as the key to development. (Food and Agriculture Organization, 2003).

In 1996, the new FAO director-general, Jacques Diouf proposed a World Food Summit. This Summit, held in Rome, November 13-17, brought together representatives from 185 countries and the European Community and some ten thousand participants in all. The Summit's concluding declaration stated: "Food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life. (www.fao.org/docrep/003/w3613e/w3613e00.HTM).

The Summit's action plan pointed to the impact of factors like trade, aid and jobs on food security. Solving the hunger problem required action on multiple fronts, not just food and agriculture. World leaders pledged to halve the *number* (not the proportion) of undernourished people by 2015.

The Summit's plan of action included seven "commitments" by the participating governments to achieve: 1) an environment for eradicating poverty and creating durable peace; 2) access to nutritionally adequate and safe food by all; 3) participatory and sustainable policies and practices for food, agriculture, fisheries, forestry and rural development; 4) agricultural and overall trade policies conducive to universal food security; 5) responsiveness to food requirements arising from natural disasters and man-made emergencies; 6) public and private investments in human resources, sustainable food, agriculture, fisheries and forestry systems and rural development; 7) implementation, monitoring and follow-up in cooperation with the international community. (www.fao.org/wfs/index_en.htm). An FAO campaign called Telefood the following year reached an estimated half a billion people.

. . . And IFAD

In 1997 the Council of Governors of the International Fund for Agricultural Development was restructured such that its 164 members were grouped into three categories: OECD countries, petroleum-producing countries and all other (mainly developing) countries.

The Forgotten Goal

In September 2000, at a United Nations-sponsored Millennium Summit, 189 nations subscribed to a set of eight goals for freeing all human beings from a life of want. The Millennium Development Goals forced a re-evaluation of development strategies by national governments and international donors alike.

The first of the UN's eight Millennium Development Goals is the eradication of poverty and hunger. One target is halving between 1990-2015 the *proportion* of people who suffer from hunger. Specific indicators used by the United Nations secretariat to measure progress are a) prevalence of underweight children at or below five years of age and b) proportion of the population below the minimum level of dietary energy consumption. (www.undp.org/mdg/goal1.shtml)

Agriculture and rural development regained prominence on the world's "to do" list. While agriculture contributes only seven percent of the gross world product, it is a vital path out of poverty. Over the prior two decades, grain production in India and China, two historically famine-prone nations, increased to the point that they needed systems for disposing of surpluses. Thanks to adoption of market-oriented policies and green revolution techniques, China's grain output nearly doubled. India's approach featured price supports and investment in infrastructure suited to higher-yielding varieties. (Webb, Patrick, 2003:5).

Some parts of the world are on target to meet—or have already met—the anti-hunger goal. Impressive—until recently—global economic growth, alarming rates of obesity worldwide (sometimes called "globesity") as opposed to starvation, and the emphasis on open markets and free trade have combined to divert attention from the world's undernourished. Hunger and malnutrition persist. Sub-Saharan African remains the part of the world that is at highest risk.

The world community *has* improved its ability to respond rapidly and effectively to emergencies (war, floods, drought, earthquakes, volcanic eruptions) that disrupt food supplies. Modern technologies have made natural disasters more predictable and their effects generally less catastrophic. For example, the satellite-based Famine Early Warning System, introduced in 1986, gives advance notice of impending drought thereby enhancing the world's ability to stave off famines. At least in principle—effective disaster response still requires the heroic efforts of many people and organizations.

The Millennium Development Goals have concentrated the world's attention on key development issues, including the eradication of hunger. They have fostered structural reform in United Nations agencies like the Food and Agriculture Organization, World Food Program, and International Fund for Agricultural Development. They have established a framework for strategic cooperation among governmental and nongovernmental organizations, both nationally and internationally.

The goals themselves are modest. If the anti-hunger goal were met exactly in every country, the proportion of hungry people in the world's population would have dropped from twenty percent to ten. The world's population in 2015 is projected to be 7.2 billion. That means that some 720 million people would remain hungry despite achievement of the goal. Hardly cause for wild celebration.

XI. The Elusiveness of Food Security

The G8

In 2001 the G8 meeting, the group's first of the new millennium, was held in Genoa, Italy (July 20-22) and included food security and safety on the agenda. The G8 include heads of state and government from the major industrialized democracies, namely Canada, France, Germany, Italy, Japan, Russian Federation, United Kingdom and United States, plus representatives from the European Union.

The group's annual meetings on the most salient international issues began in 1975 with six countries. Canada joined in 1976 and the European Community in 1977; in 1994 Russia began participating in selected sessions, attained full membership status by 1998 and hosted the G8 meeting in 2006. (www.g8.utoronto.ca/what_is_g8.html).

The final communiqué declared that "food security remains elusive" and reiterated the objective to achieve "access to adequate food supplies and rural development." It emphasized the need to improve agricultural capacity in developing countries and endorsed "the introduction of tried and tested new technology, including biotechnology, in a safe manner and adapted to local conditions" (www.g8.utoronto.ca/summit/2001genoa/finalcommunique.html).

Regarding food safety the leaders pledged to support "a transparent, scientific and rules-based approach" and encouraged dialogue among "governments, scientists, consumers, regulators, and relevant stakeholders in civil society" as a way to build public confidence. (*ibid.*) Ministries of Agriculture can promote improvements in food quality and safety as well as more informative, easily understood, labeling.

WFS+5

The Food and Agriculture Organization held a follow-up to the 1996 World Food Summit in June 2002 to review the world's progress in eradicating hunger and malnutrition. Dubbed the World Food Summit+5, the conferees determined that headway had been made and success stories could be found. However, the number of malnourished people was falling by only six million a year, a far cry from the 1996 Summit's objective of twenty-two million a year.

One outcome was the establishment in 2003 of the International Alliance Against Hunger (IAAH), whose initial members included FAO, International Fund for Agricultural Development, World Food Program and Biodiversity International (formerly International Plant Genetic Resources Institute). Through information, coordination and advocacy it seeks to make sure that no one lacks access to the world's ample food supply. In cooperation with the Rome-based organizations, national alliances work to set nationally legislated targets and mount anti-hunger programs.

The governments of Brazil and Sierra Leone called for the full engagement of government, civil society and international donors in the effort to eliminate hunger in their countries. Other countries (e.g. Colombia, Ghana, Indonesia, Kenya, Mozambique, Peru, Senegal and Tanzania) joined in. Comprehensive approaches were designed to cover the spectrum of food related activities: production, off-farm income-generating opportunities, rural infrastructure development, urban agriculture, marketing, pricing, access and safety nets.

In some cases the new approaches stressed expanding the principles of the Special Program for Food Security to medium and large farms. In others they focused on

building national capacity to scale up local pilot projects, reform agricultural policy, create more responsive government institutions, promote land reform, protect natural resources, and deliver educational and training opportunities to rural residents.

Between 1995 and 2005, 105 countries had established at least some version of a *special* program for food security that featured local pilot projects. By the middle of 2006, nearly half had started shifting to a *national* program for food security aimed at reaching the entire food insecure population. (Food and Agriculture Organization, 2007b). Guatemala established a Food Security Secretariat. Nigeria expanded successful local water management techniques while aiding small farmers to diversify production and increase yields. Cambodia has scaled up its program to aid landless women and war widows with community-based micro-projects and other rural development initiatives.

FAO's Expanded Support System

The Food and Agriculture Organization has had to expand its support system to assist member countries. (Food and Agriculture Organization, 2007b). It has brokered South-South cooperation agreements under which specialists from advanced developing countries like China assist host governments. By the end of 2006 there were thirty-seven such agreements.

There have also been created some twenty Regional Programs for Food Security that raise public awareness about food security, formulate regional food and agricultural trade policies, align border measures and safety standards, and promote communication among member states.

The eight member states of the West African Economic and Monetary Union (UEMOA) have made it easier for small inland farmers to sell their produce in coastal urban markets by liberalizing agricultural trade, halting informal taxation at border crossings and aligning their policies on food safety and plant and animal hygiene. (Food and Agriculture Organization, 2007b). Ibid. The Union Economique et Monétaire Ouest Africaine (UEOMA) was created in 1994; its eight members with a combined population of about 75 million are Benin, Burkina Faso, Côte d'Ivoire, Guinea-Bissau, Mali, Niger, Senegal and Togo.

Plant Genetic Resources (2)

In 2001, after seven years of negotiations, the FAO Conference adopted the International Treaty on Plant Genetic Resources for Food and Agriculture. It was designed to be in harmony with the International Convention on Biological Diversity. Under the Treaty, countries agreed to establish a Multilateral System to foster access to plant genetic resources for food and agriculture and to share the benefits from their use fairly and equitably.

The Multilateral System applies to over 64 major crops and forages. Access to plant genetic resources is to be achieved through a Standard Material Transfer Agreement. The Treaty came into force on June 29, 2004, ninety days after forty countries had ratified it. The Treaty's Governing Body is composed of the ratifying countries.

The proportion of undernourished people in developing countries fell from an estimated 20 percent in 1990-92 to 17 percent in 2001-03. However, due to population growth the *number* of undernourished people in developing countries dropped only by three million, from 823 million to 820 million, a difference within the

statistical margin of error. In addition to the 820 million, there were an estimated 25 million undernourished in the so-called transition countries (located mainly in eastern Europe) and 9 million in developed countries for a total of 854 million. (Food and Agriculture Organization, 2006:8).

The GATT had included agriculture but retained a number of loopholes such as import quotas and export subsidies. The Uruguay Round of trade negotiations (1986-1994) led in 1995 to the first multilateral agreement on agriculture. It was hailed as a step toward fairer, less distorted, more orderly trade arrangements. New negotiations were launched in 2000 as required by the Uruguay Round's Agreement on Agriculture.

Dead End at Doha

The process continued in 2001 at the World Trade Organization's fourth ministerial meeting held in Doha, Qatar. Reflecting the political sensitivity of the topic, 121 countries submitted proposals for negotiation on agriculture. The resulting ministerial declaration, adopted November 14, committed the member states to comprehensive negotiations on "substantial improvements in market access; reductions of, with a view to phasing out, all forms of export subsidies; and substantial reductions in trade-distorting domestic support." (World Trade Organization, 2003:6).

In recipient countries food aid displaces commercial imports. This issue has proved contentious in the World Trade Organization's Doha Round. One alternative is for donors to provide cash so that people can buy food locally. By 2005 such domestic procurement amounted to fifteen percent of all food aid. While lowering transaction costs, this can create local or regional market disruptions. (Food and Agriculture Organization, 2006:vii) The Doha Development Agenda continues to be the subject of multilateral trade negotiations in agriculture and other areas.

Mission Creep at IFAD

Lennart Båge from Sweden was elected as the fourth president of the International Fund for Agricultural Development (IFAD) on February 2001 and reelected four years later. The Fund has expanded its mission from a tight focus on expanding food production for the poorest people in the world's poorest areas to an overarching goal of "enabling the rural poor to overcome their poverty."

It seeks to accomplish this "through harnessing knowledge, building regional and international coalitions, and helping to establish institutional and international policy frameworks that support the poor." (International Fund for Agricultural Development, 2005: 79). In this it has followed the lead of other development organizations seeking to improve conditions in rural areas generally, through market access, better roads, extension services and micro-credit initiatives.

There is a downside. IFAD may have lost its sharp focus on increasing food production for the world's rural poor and turned into just another player in the global development band without a distinctive mission, target group and capacity. (International Fund for Agricultural Development, 2005:21). The trend toward mission creep is noticeable in other intergovernmental and nongovernmental organizations. Everyone wants to be in on the sustainable development game at the highest levels of policy and programming. That's where priorities are set and resources allocated. However, at the field level, the "all things to all people" approach can breed infighting over resources, loss of focus and operational confusion.

Whether to provide food aid directly or in the form of cash and vouchers is a burning issue. The choice depends on the availability of food and the functioning of local markets. If hungry people have access to sufficient food through local markets, it makes more sense to give them the wherewithal to buy it rather than provide outside food from donors.

When food aid is distributed during a time when people could not otherwise obtain it, such as during the “hungry season” (the period before a new harvest), local markets can remain stable. By making up for local supply shortfalls, well-timed food aid can prevent price spikes. This can alleviate the need for poor people to take on unsustainable debt or liquidate assets like tools and livestock to pay for food.

But when food aid arrives after the period of a shortfall it may increase overall food supply well above market levels, bring down prices and lower the incomes of local producers. The latter can be a case of better never than late. The situation is complicated by the proliferation of assessment methods and lack of coordination among donors, resulting in disparate food need estimates.

A 2005 food crisis in Niger had the earmarks of traditional famine: drought, locusts, poverty, malnutrition, disease. With prices rising in January 2005, millions of people could not afford to buy grain, mainly millet and sorghum. But rather than famine, which suggests abnormal conditions, this was instead two separate food emergencies on top of the country’s normally severe chronic malnutrition. “[I]t is not . . . certain that the levels of malnutrition during 2005 were far outside the range of chronic rates found every year in Niger.” (Eilerts, Gary, 2006.)

Despite the poor harvest, the chief causes of the two emergencies lay elsewhere: outmoded economic practices, health and sanitation problems, poor water quality, endemic poverty, lack of coordination between the government of Niger and the international aid community, and traditional dietary norms.

In the pastoral and agro-pastoral regions, which were considered the most vulnerable, there were distributions of food aid and subsidized sales of government-owned food stocks. (Eilerts, Gary, 2006.) But disagreements between donors and the government of Niger on how best to respond led to months of delay before food aid arrived. (U.S. Government Accountability Office, 2007:51.)

Meantime, paradoxically, even worse conditions prevailed in two relatively prosperous urban centers to the south, Maradi and Zinder, and along the border with Nigeria. These were commercial hubs and sources of agricultural surpluses. Yet, for example, at Médecins Sans Frontières centers, the incidence of severe malnutrition spiked, especially among children six months to two years.

Child malnutrition, however, was related less to the lack of food availability than to factors like very young first-delivery mothers, diarrhea, high rates of infant mortality, and post-partum weaning practices (e.g. reliance on water, herbal tea, and cow’s milk.).

On both sides of the Niger-Nigerian border, traders and merchants traditionally have provided commercial financing and consumption loans. With cash income both low and intermittent, poor farmers and wage-laborers meet their food consumption needs by “borrowing” grain stocks pegged to pre-harvest prices and paying them back later based on post-harvest prices. Since pre-harvest prices were typically higher than post-harvest, the borrowers paid back more in quantities of grain than they originally took out—at a net loss of disposable income. (Eilerts, Gary, 2006.)

An International Financing Facility

The United Kingdom's former prime minister Gordon Brown has advocated the establishment of a development-oriented International Financing Facility. To make aid flows more stable and predictable, the IFF would issue bonds whose repayment is linked to and guaranteed by commitments from creditworthy member countries. Failure to meet those commitments would be tantamount to sovereign default.

The proceeds from IFF bond issuances would go toward development financing, usually in the form of grants. Recipients would be eligible for grants through 2015, after which the IFF would use its revenue streams to repay bonds. This in effect front loads development assistance with the goal of accelerating progress toward realization of the millennium development goals.

The scheme depends on the effective use of increased aid within the MDG timeframe. A risk is that ramped-up aid to selected developing countries could trigger inflationary pressures. The idea has sparked interest in fostering development if not through this then similar alternatives grounded in global bond markets.

In 2006, at the initiative of the UK government, an International Financing Facility for Immunization (IFFIm), a private company, was launched and has since raised some two billion dollars in bond markets on the strength of legally binding pledges from donor countries. Grant funds are channeled to immunization programs in recipient countries through a public-private entity, the GAVI Alliance (formerly Global Alliance for Vaccines and Immunization). The World Bank functions as financial adviser and treasurer. Other members of the Alliance include the World Health Organization, UNICEF, Bill and Melinda Gates Foundation, as well as individual governments, health research institutes, vaccine producers and civil society organizations. (www.iff-immunisation.org/index.html.)

The Rome-based Agencies

The Food and Agriculture Organization, World Food Program and International Fund for Agricultural Development see themselves as having different mandates but a common vision.

The Food and Agriculture Organization's core strength is the production of new knowledge in agriculture, fisheries, forestry, food and nutrition. Its operational component provides individual nations and regions of the world with data on hunger, technical advice on agricultural policy and capacity-building assistance. FAO's Codex Alimentarius sets the standards for the commodities (e.g. blended food) used by the World Food Program.

The World Food Program's comparative advantage lies in the depth and extent of its field presence. Its global network of partners enables it to move quickly and massively in response to disasters. For example, in the 2004-2005 period, it was able to deal in timely fashion with multiple overlapping emergencies—earthquakes in Iran and Pakistan, humanitarian crisis in Darfur, tsunami in Indonesia. In cooperation with host governments and local and international nongovernmental organizations, it was able to move large amounts of food and other commodities rapidly to the stricken areas.

About 1.4 billion of the world's population lives on less than \$1.25 a day and some seventy percent of the poor live in rural areas. With a focus on smallholder agriculturalists, the International Fund for Agricultural Development works in

developing countries to eliminate rural poverty, improve productivity, increase incomes and enhance the quality of lives. Primarily IFAD provides financing for projects designed by other entities. It supports small farmers, women, fisher folk, pastoralists and small entrepreneurs in rural areas. In recent years it has become more directly involved in investment initiatives, policy processes, and direct oversight. In short from a financing facility it has evolved into a full-fledged development institution.

The respective roles of the three Rome-based agencies can be illustrated by their response to the devastating December 26, 2004 tsunami in the Indian Ocean. The Asia-Pacific region is one of the most disaster-prone in the world. The 2004 tsunami destroyed fishing and farming communities along coastal rural areas and claimed over two hundred thousand lives— India (10,714 dead), Indonesia (166,320 dead), Maldives (83 dead), Sri Lanka (38,195 dead), and Thailand (5,303 dead). Over two million people were displaced.

(www.fao.org/workingtogether/index_en.htm; www.ifad.org/tsunami/index.htm).

The World Food Program organized a complex relief operation involving ships, a major airlift (helicopters and fixed-wing aircraft) and truck convoys to bring food to the survivors, especially in Sri Lanka and Indonesia. By the end of May, 2005, the World Food Program had delivered food to 2.24 million people. Emergency relief was followed by recovery operations that included aid to mothers and infants, school feeding, food for work programs and food for displaced people.

The speed of delivery of food to tsunami victims benefited from prepositioning, a tactic used by the U.S. Department of Agriculture and the U.S. Agency for International Development. Prepositioning avoids drawn-out procurement processes and reduces transportation time and cost. USAID has prepositioned food commodity stocks in warehouses in Lake Charles, Louisiana; the port of Dubai; and Djibouti, East Africa. In the case of the tsunami, USAID diverted a carrier on route to Dubai to the disaster site where it immediately made available seven thousand metric tons of food aid. (U.S. Government Accountability Office, 2007:34).

The Food and Agriculture Organization focused on rebuilding livelihoods, food production capabilities, and infrastructure. It supplied fishers with engine parts for boats, fishing nets and other equipment. It provided farmers with seeds and motorized cultivators. In Sri Lanka, for example, it assisted with the repair of some four thousand fishing boats and one thousand boat engines. In conjunction with local villages, district councils and national governments, its forestry program sought to balance the demand for wood to rebuild homes and other structures with measures to prevent illegal logging and long-term preservation of forest resources.

Within hours of the tsunami, the livelihoods of several hundred thousand poor rural people were wiped out. The International Fund for Agriculture Development launched a program to assist with reconstruction of some 250 villages in Aceh, the worst hit province in Indonesia, the worst hit country. It extended the area of the Income Generating Project for Marginal Farmers and Landless to include Aceh and North Sumatra. It undertook livelihoods support, coastal rehabilitation and resource management programs in Sri Lanka. To support these and related endeavors, the Fund used its own resources augmented by appeals for cofinancing from partner organizations.

The work of the Food and Agriculture Organization is designed along technical rather than geographical lines. Its organizational structure says something about its areas of emphasis. In 2007 FAO was composed of an Office of the Director-General plus eight departments: 1) Agriculture and Consumer Protection; 2) Economic and Social Development; 3) Fisheries and Aquaculture; 4) Forestry; 5) Knowledge and

Communication; 6) Natural Resources Management and Environment; 7) Technical Cooperation; and 8) Human, Financial and Physical Resources. It struggles to find a balance serving as a global knowledge resource and a service organization to individual countries. (Food and Agriculture Organization, 2005:4).

In addition to the headquarters in Rome, there are five regional offices (Africa, Latin America and the Caribbean, Asia and the Pacific, Near East and Europe) plus seven subregional offices (North Africa, Central Africa, Southern and East Africa, Central Asia, Pacific Islands, Caribbean and Eastern Europe). Additionally there are liaison offices with the United Nations (Geneva and New York), North America, European Union and Belgium, and Japan. Currently the organization's membership consists of 189 countries plus the European Union. Its annual budget stands at about \$766 million. In 2005 FAO's Director-General Jacques Diouf of Senegal was re-elected to a third six-year term.

XII. Crisis Relief and Economic Growth

Sudan

Sudan is the largest country in Africa and one of the poorest in the world. On the UNDP's Human Development Index for 2006, it ranked 147th out of 177 countries and territories. The country has a history of recurring famines. Its western region has been wracked by conflict since 2003, despite the 2006 Darfur Peace Agreement. In Nyala, Western Sudan, a 1984 famine led to a sharp increase in food prices after a cash assistance program was introduced. When it became clear that cash transfers would continue, the flow of grain from surplus areas became more regular and prices stabilized. (Peppiatt, David; Mitchell, John; and Holzmann, Penny, 2001:5). The east suffers from chronic food shortages, underdevelopment and sporadic conflict.

A Comprehensive Peace Agreement led to establishment of a government of national unity in 2005. It didn't hold. Sudan's south continued to struggle with recovery from two decades of civil war. Under a January 9-15, 2011 referendum, the area voted to become an independent nation, the Republic of South Sudan. To cope with persistent malnutrition, in 2010 the World Food Program sought to assist some 11 million Sudanese out of a total estimated population of 36.9 million.

The World Food Program and Its Partners

In 2009 the World Food Program distributed food to 101.8 million people. (www.wfp.org/wfp-numbers). Despite its deep presence—unique in the international system—in so many countries, the Program is not widely known outside of governmental and nongovernmental organizations. It collaborates with host governments, many UN components including the Food and Agriculture Organization, International Fund for Agricultural Development, United Nations Development Program and the United Nations High Commissioner for Refugees as well as specialized agencies like the World Health Organization and World Bank. Its main program categories are emergency relief, protracted relief and recovery and development.

In 2006 the World Food Program distributed 4.7 million metric tons of food, of which 43 percent was handled by nongovernmental organizations. In that year it partnered with 3,255 nongovernmental organizations, of which 238 were international, 3,017 "local" (country-based). The main partners in terms of breadth of collaboration were NGO federations and alliances, led by Caritas Internationalis which collaborated with the World Food Program in 48 countries and World Vision Partnership which collaborated in 34.

Others that collaborated in a number of countries included CARE International (26), Medecins sans Frontieres-International (34), International Save the Children Alliance (21), Action by Churches Together (21), Action Contre la Faim Network (21), Oxfam International (16), Adventist Development and Relief Agency International (16) and ActionAid International (3). (World Food Program, 2007:26).

The latter was also the main partner with respect to volume of food (268,848 metric tons), followed by CARE International (208,447 metric tons). The remainder of the top ten in terms of metric tonnage of food handled were Action by Churches Together (130,34), Save the Children Alliance (95,413), Norwegian Refugee Council (88,895), Caritas Internationalis (83,893), German Agro Action (71,700), Oxfam International (68,277), Samaritan's Purse (46,804) and Adventist Development and Relief Agency International (31,302). All were alliances or federations except

Norwegian Refugee Council, German Agro Action, and Samaritan's Purse. (World Development Program, 2007:28).

The food not only helped save lives in crisis situations, it also served relief, recovery and development purposes. Food aid was used to create jobs and preserve livelihoods under food for work arrangements, improve the nutritional status of vulnerable people, especially poor women and children, and facilitate access to training and education (e.g. via food for training initiatives) with emphasis on reduced gender disparities. (World Food Program, 2006:7, 9). The \$500 million in local purchases each year by the World Food Program benefit small farmers in developing countries. In Uganda, for example, half the food distributed through the World Food Program is purchased locally. (www.wfp.org/english/?n=39)

Strategically, the World Food Program is placing greater emphasis on vulnerability analysis mapping, food risk assessments and capacity building in the host country management of domestic food programs. (World Food Program, 2003). The private for-profit sector, especially large corporations, is a growing source for donations, expertise, job creation and environmental sustainability.

Protectionism and Price Distortions

Since most of the world's poorest people live and work in rural areas, trade liberalization in agriculture as envisioned at Doha was expected to reduce poverty and foster development. Unfortunately the hypothesis has not had a chance to be tested. Developing and developed countries alike persisted in protecting their agricultural sectors.

Through measures like import tariffs, domestic price supports and export subsidies, the United States, European Union and Japan are considered the countries most responsible for distortion in world agricultural trade. Developed countries' export subsidies are limited to relatively few commodities—mainly dairy, sugar, beef, fruit, vegetables, rice, wheat and coarse grains—but these commodities are ones that developing countries could otherwise more easily produce and export. (www.cairnsgroup.org/factsheets/index.html).

Over the 2005-2007 period, Japan spent \$49 billion in domestic agricultural supports, the United States over twice that amount (\$102 billion) and the European Union three times as much (\$151 billion). The United States has aggressively sought cuts on import tariffs to open foreign markets for its farm products while retaining its own agricultural subsidies. US cotton producers receive more in subsidies than the entire GDP of Burkina Faso, where the livelihoods of two million people depend on cotton production.

Such subsidies depress world prices and take market share away from poor countries. (www.cairnsgroup.org/factsheets/index.html). In developing countries agriculture constitutes thirty-three to fifty percent of economic output (compared to three to five percent for industrialized countries). Agricultural trade liberalization should lead to higher incomes, less poverty, and improved food security in the developing world.

Brazil and India have joined with Australia (chair of the Cairns Group), Japan, United States and European Union to break the deadlocks in agriculture. Talks pursuant to the Doha Round were suspended in July 2006 when the six failed once again to reach agreement.

The International Fund for Agricultural Development remains the only international financial institution dedicated exclusively to reducing rural poverty in

developing countries. At the end of 2006 IFAD was financing 186 projects and programs in 81 countries plus Gaza and the West Bank. The investment cost was \$6.2 billion. Of this amount, IFAD provided about \$2.9 billion, the remaining \$3.3 billion being cofinanced by the organization's partners. (International Fund for Agricultural Development, 2007:2, 92).

Rising Prices of Key Commodities

By 2008 the International Alliance Against Hunger had expanded its membership to include international non-governmental organizations and helped in the formation of some twenty national alliances, with more under development. The alliance has developed into "a voluntary association of local, national and international institutions." (International Alliance Against Hunger, 2007). One notable tactic is "twinning", whereby a national alliance in one country will partner with another to share experiences and foster anti-hunger action; an example is the twinning of the United States alliance with its counterparts in Ghana and Jordan.

While food markets vary from one country to another, international food prices for a number of key commodities have risen significantly and are likely to remain high for several years at least. The main contributing factors are higher prices for imported staples, increased domestic demand, and higher costs for inputs like fertilizers and energy. Higher food prices hurt the poor who spend a higher share of their income on food. (World Bank, 2006:42). On average, a 10 percent rise in seven key food prices leads to an 0.4 percent rise in the poverty rate.

In the first three months of 2008, prices in real terms for all major food commodities were the highest in thirty years. The sharp rise in agricultural commodity prices in the 2006-2008 period has been driven largely by vegetable oils, grains, dairy products and rice, less so by meat and sugar. (Food and Agriculture Organization, 2008:1-3). At the same time the emerging biofuels market has increased demand for sugar, maize, cassava, palm oil and oilseeds.

Take maize. While it continues to be used for food, animal feedstocks and exports, it is increasingly used to meet the growing demand for ethanol. There is not only diversion of much maize production from use as food to use as fuel but also a greater proportion of land set aside for maize production instead of other food and feed crops. In 2008, over thirty percent of the U.S. maize harvest was forecasted to go to ethanol distilleries. (Food and Agriculture Organization, 2008:10.)

Elsewhere, Brazil devotes about half its sugarcane to the production of ethanol. Others with biofuels programs (e.g. palm oil for biodiesel fuel) include India, Indonesia, Malaysia, Mozambique and several Central American countries. (World Bank, 2007:70). Biofuels can contribute to food security as well as sustainable energy production—or they can put both at risk.

The demand for biofuels increases the value of farm output and can stimulate additional private investment in agriculture. That can push food prices up. Higher food prices hurt extremely poor households with the associated risk of hunger and malnutrition. Moderately poor households, faced with declining purchasing power, are forced to give up protein-rich foods like meat and dairy products in favor of less costly, higher energy rice, wheat, maize and other cereals. Expenditures for health and education suffer as people struggle to put food on the table.

True, some rural households in developing countries gain from rising food prices. The profits of poor farmers from the sale of their food products rise and the demand for rural labor increases. Indeed a rise in food prices presents an opportunity for

countries to help low income rural producers to increase their overall production and the marketable supply of same.

Policies along this line include making research, extension and financial services more available, giving marginal farmers more assured access to land and water resources, and managing the risk associated with weather and climate change with affordable insurance. (Food and Agriculture Organization, 2008:46.) Further, recipient governments and donors could support, even subsidize, more rural investments in seeds, fertilizers, small irrigation pumps, road building (and maintenance!), food processing and marketing enterprises.

Nevertheless, while such support can be mitigating, the overall impact of rising food prices in both rural and urban settings is likely to be adverse. Poor people rely more on staples making them more vulnerable to commodity price increases. While there are both winners and losers among the poor, the price effect outweighs the income effect. (Ivanic, Maros and Martin, Will, 2008:18.)

This trend is a reminder of the periodically volatile interactions among food supply, food prices, global markets and the nutritional needs of the world's people. In the short and medium term steps are needed to minimize the impact of declining food stocks and rising commodity prices on the poor in developing countries. In the broader context of the Millennium Development Goals, the issue is not only the adverse impacts of commodity price pressures. Long term, international structures and relationships must be modified to reduce for good the absolute numbers and proportion of people who needlessly live with (or die from) from hunger and malnutrition.

The High Costs of Food Aid

Food aid is used for emergency and non-emergency purposes, though the latter has been declining as a proportion of the whole. Food aid donors include some eighty-two countries, associations of nations, nongovernmental organizations, the Organization of Petroleum Exporting Countries (OPEC) fund, private donors and international finance institutions like the World Bank and the African Development Bank.

Many donors have scrapped providing food in-kind in favor of cash donations for local procurement. Food aid procured locally can more easily match local diets and be cheaper and faster than aid shipped in from other countries. However, problems can arise with transportation, food quality standards and vitamin fortification. (Webb, Patrick, 2003:18fn12.)

The United States continues as the world's foremost provider of food aid. In 2006 the largest program (Title II , P.L. 480) benefited over seventy million people. It provided about 43 percent of the total contributions to the World Food Program, including seventy percent of its in-kind contributions.

Other major in-kind donors were China, the Republic of Korea, Japan and Canada. U.S. food aid went to fifty countries, eighty percent of it to Africa. (U.S. Government Accountability Office, 2007:7-8.) About seventy percent of U.S. food aid went to food emergencies. (U.S. Government Accountability Office, 2007:20.) The United States, European Union, United Kingdom and Japan contribute about seventy percent of the World Food Program's resources. To meet its requirements, the WFP is looking to expand the number of donor countries.

U.S. total commodity procurement and transportation costs are high compared to the rest of the world. This is due mainly to ocean shipping freight costs which in 2006 averaged about \$171 a metric ton, compared to overall World Food Program freight

costs averaging around \$100. Average total commodity and transportation costs for a metric ton of food aid in 2006 were about \$670. A \$10 per metric ton reduction in transportation costs could support an additional 43,900 metric tons of food, enough to feed an additional 850 thousand people for three months, the length of a typical peak hungry season. A metric ton can feed about 1,740 persons a day. (U.S. Government Accountability Office, 2007:16.)

Adding to higher costs is U.S. policy giving preference to the U.S. flag commercial fleet. The Cargo Preference Act of 1954 (P.L. 83-664) requires that, providing that rates are fair and reasonable, at least half the gross tonnage of all government-generated cargo be transported on private U.S.-flag commercial vessels. 1985 amendments to the Merchant Marine Act of 1936 increased the percentage of certain cargoes carried on U.S.-flag vessels from 50 to 75 percent. (U.S. Government Accountability Office, 2007:16.)

One hundred U.S. flag vessels employing some five thousand U.S. citizen mariners carry U.S. food aid cargoes. The operation of these vessels is expensive due to taxes, health and safety regulations and labor costs. U.S. policy is rationalized on the grounds that a fully functioning U.S. flag fleet is essential to the nation's defense capabilities. Besides food aid they may also transport ammunition, for example. (U.S. Government Accountability Office, 2007:13.)

The principal international agreement governing food aid remains the Food Aid Convention. From being a vehicle to dispose of surplus grain stocks, it has evolved to embrace development objectives. Besides agreeing to a minimum level of aid (ten million metric tons), signatories commit themselves to timely delivery of good quality food, with emphasis on local and regional markets and respect for traditional diets.

The 1999 Convention urges members to make sure that food aid supports the "alleviation of poverty and hunger" and "is consistent with agricultural development". Its list of products goes beyond grains (wheat, barley, maize, oats, etc.) to include edible oils, root crops, skimmed milk powder, and sugar among others. (International Grains Council, 1999, Articles I and IV.)

There is an insidious form of "famine"—not the result of drought or flood but of inadequate nutrition extending over years, even decades. Direct food aid can meet emergency needs but for the long term poor people will achieve reliable access to nutritious food only through decently paying jobs and dependable safety nets—in short, adequate purchasing power. For those reasons, alternatives based on cash assistance and monetization have moved front and center.

XIII. Undernutrition as Famine

Famine makes headlines. The world is shocked by the widespread scarcity of food that leads to mass starvation, epidemics and innumerable deaths. We normally think of famine as time-bound, confined to a set period of time in a defined geographical area. When the rains fall, or the floods recede, or the harvest returns to normal, or sufficient relief supplies arrive, famine is arrested. Crisis over.

But there is a different kind of famine, one that stretches over long periods of time and insidiously maims or kills millions of people around the globe. It occurs even in the midst of plenty, because its victims lack access to the amounts and types of nutritious food that would enable them to enjoy healthy productive lives. This kind of famine, the slow kind, rarely makes the news.

War, climate change, recession, inflation, economic exploitation—all retard progress against the elimination of hunger in the world. They hinder the good work done by the United Nations and other international agencies, individual governments, non-governmental organizations, agricultural research entities, hard-working farm communities, extension services, high-profile celebrities (e.g. Bono), volunteers, and caring neighbors.

Meeting the demands of an expanding global population will require continued advances in technology-driven agricultural productivity. It will also require better policymaking nationally and internationally on food and nutrition, improved social and economic organization globally and a shared sense of each person's entitlement to a sufficiently nutritious diet.

If access to food were codified in every nation's law as a human right, then everyone would have a legal entitlement to adequate nutrition. This right would be buttressed by accountability mechanisms and avenues for appropriate legal claims against public and private institutions that impeded access. (United Nations General Assembly, 2008:11). The world's hungry people would gain a degree of political clout against big, well-financed interest groups.

The Cost of Food Insecurity

No rational person takes pleasure in the sight of skeletally thin children with toothpick arms and distended bellies or the gaunt listless adult victims of famine. Allowing one out every six or seven people on earth to exist without enough food is wrong, period. Ideally no one—let alone hundreds of millions of people around the world—would ever lack access to safe and high-quality food with nutrients (i.e., carbohydrates, fats, vitamins, protein, minerals and water) sufficient for an active, healthy life.

Food is “an essential medicine for immunization and paediatric care.” (United Nations Children's Fund, 2007:91). Society incurs a cost when the productive capabilities of its members are diminished.

In 2006, 9.7 million children under age five died. (United Nations Children's Fund, 2007:iii). The Under Five Mortality Rate (U5MR) is a reasonably robust indicator of child and overall societal health. That is because the mean or average is less subject to being skewed by an particular subgroup (e.g. the extremely wealthy in the case of income). Major contributing factors were hunger and malnutrition which accounted for the deaths of over ten thousand children *every day*. (United Nations High Level Task Force on the Global Food Crisis, 2008:9).

Undernutrition renders its victims more vulnerable to sickness, disability, the birth of underweight babies, lower academic achievement in school age children, and lack of adults' capacity for work. It raises the risk of heart disease, diabetes and some cancers. Inadequate nutrition ramps up to adversely affect macroeconomic performance. "When a significant proportion of the population is undernourished, potential rates of GDP growth can be curtailed." (Food and Agriculture Organization, 2007a:Section 8.4.1).

The main cause of food insecurity is poverty, a condition where people are unable to produce enough food or exchange their labor for the wherewithal to obtain food. Chronic food insecurity contributes to political instability, environmental degradation, migration pressures, and unsustainable development. Few countries can grow economically without advances in agricultural productivity. Food insecurity drives communities to exploit marginal lands, misuse water supplies, deplete soils, and ruin forests. Good governance is hampered where people cannot satisfy basic human needs.

Famine and Undernutrition

The world averages some thirty food and humanitarian crises a year, double the number in the 1980s, due to increases in poverty, armed conflicts and natural disasters. (U.S Government Accountability Office, 2007:1). These crises are typically due to lack of household access to food rather than lack of food in the larger society.

Famine and undernutrition can be *transitory* due to natural or man-made disasters or *chronic*, the persistent effect of poverty and unemployment. Left unchecked, famine—a state of acute hunger—leads inexorably to death. Undernutrition, less lethal but more widespread, is a severe imbalance in the quality and quantity of food consumed, to the point of interfering with normal activities, adversely affecting one's general health and increasing the risk of infectious disease.

Undernutrition implies consumption of too little food and (usually) the wrong types and mixes of food to sustain normal activities. The obverse is overnutrition, the consumption of food in such high quantities and/or of such quality that the result is excess body fat and at the extreme obesity. Undernutrition and overnutrition each manifest an aspect of the disordered eating condition we label malnutrition.

A minimum of 2,200 kilocalories is needed to sustain energy levels for persons engaged in light activity. Below that level, the specter of hunger looms. An estimated five percent to 35 percent of a country's population is undernourished when per capita food supplies range from 2,201 to 2,500 kilocalories a day. This risk drops further in the 2,501-3,000 range and is virtually eliminated above that level. Table 1 indicates that during the 2001-2003 period 28 countries supplied 2,200 or fewer kcal per person and another 33 managed only 2,201-2,500 kcal. That's more than a third of the world's countries for which there is data.

Based on FAO's 854 million estimate, which is too low but for which (unlike later estimates) detailed subgroup breakdowns are available, fully 96 percent of the world's malnourished individuals live in developing countries, about 2.3 percent in so-called transition countries, and the remaining 1.1 percent in industrialized countries. Women and children make up a large share of the world's undernourished and are at the highest risk of food insecurity. An estimated five million children die each year from hunger and malnutrition. (Food and Agriculture Organization, 2005:24). This is about half of the world's child deaths.

Sixty-one percent of the world's malnourished live in the Asia and Pacific region and an additional 24 percent in sub-Saharan Africa. (Food and Agriculture

Organization, 2006:83). The rapidly developing economies of Asia feature growing urban-rural disparities. Despite massive migration to cities, six hundred million rural people live in extreme poverty.

Table 1. Per Capita Supply of Kilocalories by Number and Percent of Countries (2001-2003)

Countries	≤2200	2201-2500	2501-3000	3001+	Total
No.	28	33	56	52	169
Percent*	16.6	19.5	33.1	30.8	100.0

*Table excludes 12 countries for which kcal data is missing.
Source: Adapted from Table A10 in Food and Agriculture Organization (2007c)184-88.

While Asia receives about a quarter of global food aid, this represents a decline from the 1990s when the figure hovered around thirty to forty percent. North Korea and Bangladesh have been the two largest recipients of food aid in Asia for the past decade.

In Africa millions of farmers, many in remote areas, barely subsist on low-productivity agriculture. (World Bank, 2007:xiii). Hunger is largely concentrated among the rural landless and small farmers whose production falls below their needs. However it is expanding among urban slums, home to millions of rural migrants.

In the late 1990s, Africa received about a third of the world's food aid; by 2006, the figure had jumped to well over half due to unpredictable weather fluctuations, wars and political strife. The main recipients of food aid have been Ethiopia (at over one million tons a year), Sudan, Eritrea and Mozambique. At 457 million, the number of food insecure people in sub-Saharan Africa is about the same as Asia's—but the region has only a third of Asia's total population. Per capita food intake averages slightly above the minimum 2,100 calories and is lowest in the world. (U.S. Department of Agriculture/Economic Research Service, 2008:10).

Conventional Wisdom

While much has changed for the better in the past two decades, the approach of the international community continues to be hampered by fragmentation, overlaps and crisis-driven responses. The words-to-deeds ratio remains excessively high. Global food security remains an elusive goal. Rapid increases in food costs and the global economic downturn are undermining recent progress toward food security.

Violent conflict such as has occurred in Angola, Ethiopia, Liberia, Mozambique, Occupied Palestinian Territories, Sierra Leone and Sudan pose a daunting challenge to humanitarian relief efforts. Even more challenging are the hunger and malnutrition that persist for the world's poorest people in normal times. When disturbing television and newspaper images of disaster disappear, memories fade.

The fact that 5.6 billion people (87.5 percent of the world's population) are adequately fed tends to obscure the hunger and malnutrition of the remaining 12.5 percent. Yet “[m]orally it makes no difference whether a human being is killed in war or is condemned to starve to death because of the indifference of others.” (Independent Commission on International Development Issues/Brandt Commission, 1980: 90).

The conventional wisdom is that the problem is not the supply of food, it's the distribution. The world community simply lacks the political will to change the picture. Commercial considerations reign. There's nothing wrong with the conventional wisdom. It just doesn't go far enough.

Increased food supplies and accelerated economic growth are "unlikely to completely eliminate poverty and food insecurity among rural populations." Food and Agriculture Organization, 1999:37). Whether food, and especially adequate amounts of nutritious food, make it to the table depends not only on aggregate production volumes but also on local availability, prices, household incomes, household coping behaviors and individual dietary needs. Food security requires more targeted approaches that are set within the larger context of the local and global economy. The most directly targeted approach would put the wherewithal to purchase food in the hands of hungry households.

Daunting Factors and Consequences

A daunting set of factors can interfere with a nation's attainment of food security. Here's a partial list:

- inadequate agricultural technologies and practices;
- inappropriate national economic policies;
- low economic growth rates;
- insufficient foreign exchange;
- underdeveloped private sector;
- population growth that outstrips availability of food;
- inefficient marketing, pricing and transportation systems;
- public and private corruption;
- emergencies (war, floods, drought, etc);
- disease (e.g. AIDS, malaria);
- donor disinterest or fatigue;
- improper harvesting, storing, and handling of food;
- cultural practices that inhibit a nutritionally adequate diet. (U.S. Agency for International Development, 1992).

Other factors adding to the risk of ill health, disability and death include unsafe water, poor hygiene and lack of sanitation. To these may be added individual bad behaviors like smoking and alcohol and drug abuse. Local dietary practices, broad societal norms and national economic underpinnings (e.g. single-commodity dependence) factor in as well. But everything starts with whether or not there is food on the table.

Food aid can be categorized as programmatic, project or emergency. Programmatic food aid is provided to the recipient country with few strings attached. Project food aid is targeted at particular beneficiary groups like the elderly, women in rural areas, specific minority populations. Emergency (or humanitarian) food aid is a short-term response to disasters, either natural or man-made. (Barrett, Christopher B.,2002:45).

Whatever its guise, food aid is faulted for distorting local agricultural markets, depressing food prices below local market levels, discouraging production by small farmers, creating dependency among recipients (both individuals and governments) on outside aid and accounting for high transfer costs. (Shaw, D. John, 2007:109). According to one study, for example, the arrival of maize food aid in Mozambique close to the harvest season caused a drop in the market price of both yellow and white maize. (Tschirley, David; Donovan, Cynthia; and Weber, Michael T., 1996). This

is the familiar food-price dilemma. High food prices undermine the food security of poor consumers. Low food prices undermine the incomes of poor farmers. (Timmer, C. Peter, Walter P. Falcon, and Scott R. Pearson, 1983).

Malnutrition

A third of the world's hungry are found in Africa, a fourth in Western Asia and a sixth in the Caribbean. (World Bank, 2007:65). Economically, chronic malnutrition is estimated to cause lifetime productivity losses of around ten percent for individuals and declines in gross domestic product (GDP) of two to three percent in the worst affected countries. (World Bank, 2007:95). This is a prescription for social and political unrest. At the 1996 World Food Summit, India's Prime Minister stated: "There can be no peace in the world if hunger is not eradicated." (www.fao.org/wfs/index_en.htm).

In countries as diverse as Mexico, Egypt and South Africa, over half the adults are overweight or obese. Paradoxically many developing countries experience high rates of both undernutrition and overnutrition. India now produces food surpluses but 210 million of its people are undernourished. Four in ten (39 percent) of the world's underweight children live in India. (World Bank, 2007:95). So one issue is how to remedy undernutrition without exacerbating overnutrition. Food security, simple enough in principle, has been rendered a complex social problem.

For individuals and households, exercising regularly, cutting back on animal-source foods and vegetable oils and consuming more fruits and vegetables are recommended. If these steps were built into daily middle and upper class life, governments could focus more attention on the undernourished poor.

For desperately poor rural communities, hunger and malnutrition can be ameliorated through improvements in food production technologies and practices (e.g. with new seed development, more widespread irrigation systems, expanded extension services), shifts toward more producer-friendly pricing, tighter farm-to-market supply chains and more sophisticated domestic and international distribution networks. And safety nets for people falling through holes in the system.

XIV. Pro's and Con's of Monetization

Donations of surplus food have benefited donor nations as well as recipients. The aid often comes with conditions tying the recipient to the donor's broader economy. Aid has been used as a marketing tool by donors in countries that can afford to purchase food at commercial prices. In some cases food surpluses are dumped with no focus on the recipient countries' actual needs.

In the past this hampered the development of alternative food security options, e.g. cash-based rather than in-kind aid. With the decline of global food stocks and with sharper focus on household access to food (rather than its general availability to the community), monetization of food aid has emerged as a popular aid mechanism.

Monetization of U.S. food aid involves "the sale, in a recipient country, for local currency, of food aid purchased in and shipped from the United States." (Simmons, Emmy, 2009:ii). Monetization was mandated as part of Title II food aid programming in the Food Security Act of 1985. From fiscal years 1999 through 2005 an estimated 4.4 million metric tons of Title II food aid was purchased in the U.S., and delivered to recipient countries where it was sold on local markets.

Among 19 cooperating sponsors who implemented the program, the largest were CARE, Catholic Charities and World Vision/U.S. (Simmons, Emmy, 2009:9). The main monetized commodities have been wheat, corn, rice and vegetable oils. (Simmons, Emmy, 2009:28).

Selling (i.e. monetizing) food aid rather than distributing it to vulnerable groups directly is appealing if the proceeds go to support food security and related development projects. Some developing countries, where rising food and energy costs and adverse exchange rates have cut into their foreign reserves, appreciate being able to pay for such food commodities with their local currency. However, since U.S. procurement and shipping costs typically exceed the value of the food in a recipient's local currency, the U.S. taxpayer subsidizes the difference.

The major downsides of monetization to recipient countries include disruption of established local markets and commercial imports, disincentives for local food production and further market development and potential long-term dependence on outside aid. (Simmons, Emmy, 2009:v).

Monetizing food aid incurs costs all along the line as food is produced, shipped, distributed locally and sold. Sponsoring nongovernmental organizations must market and sell the food. All this entails intensive oversight and management that are ladled with legal and financial risks and that can divert the sponsors from their core missions.

For the originating country, monetization functions essentially as an export subsidy. Program costs that exceed the proceeds from recipient country sales are assumed by the originating country's taxpayers.

CARE Rejects Monetization

In 2007 CARE USA, one of the world's largest humanitarian organizations, virtually terminated its decades-long participation in the major food aid programs of the U.S. Department of Agriculture. CARE USA is one of twelve member organizations that make up CARE International. The other countries with CARE members are Australia, Austria, Canada, Denmark, France, Germany, Japan, Netherlands, Norway, Thailand, and United Kingdom. It operates programs in sixty-six countries (including one member, Thailand). The organization contended that "[m]onetization . . . is far less

cost-effective than the logical alternative—simply providing cash to fund food security programs.” (CARE USA, 2006:5). This surprised and dismayed many other participants, for whom walking away from cash on the table was unthinkable.

CARE considers it counterproductive that such monetized aid is tied to the donor country’s export markets agenda and surplus disposal objectives. Food aid from U.S. must originate from domestic sources. It takes five months on average from time of appeal for Food for Peace (P.L. 480/Title II) *emergency* aid to reach the recipient country. Transportation must be on U.S. commercial carriers. Such tied food aid creates delays and is far more costly than locally procured food.

CARE has also phased out of the concessional sales (Title I) and surplus disposal (Section 416) programs of the U.S. Department of Agriculture. These programs give the U.S. unfair commercial advantage and discourage local production. CARE USA plans to continue its participation in Food for Progress only in cases where the aid is not monetized or does not come from Title I or Section 416. (CARE USA, 2006:3-4.)

To promote durable food security, CARE USA supports funding for local or regional purchase of food in developing countries. This increases food procurement flexibility and provides opportunities for small farmers. It cuts costs (especially transportation costs), saves time and reduces market distortions. A risk is that local and regional food purchases can trigger hoarding and price spikes in essential commodities, especially where markets function weakly. But CARE USA is willing to take the chance and adapt as it gains experience with this approach. (CARE USA, 2006:5-6).

Food Aid Convention

Under the 1995 Food Aid Convention donors committed themselves to providing 5.35 million (METRIC?) tons in wheat equivalent food aid. This dropped to 4.89 million tons under the 1999 FAC. However, the difference was made up by the European Union which 130 million euros or the equivalent of 588,000 tons. (Peppiatt, David; Mitchell, John; and Holzmann, Penny, 2001:4). Cash-based assistance is not universally endorsed among donors, perhaps due to donor self-interest, lingering colonial prejudices or even the legacy of medieval notions of charity where the benefactor presumably knew best.

Renegotiation of the 1999 Food Aid Convention has been stalled pending decisions by the World Trade Organization over the rules governing food aid. Unresolved issues revolve around the use of food aid by donors to subsidize their own agricultural, commercial and geopolitical interests as well as the negative impact of aid on recipient countries’ rural development, agricultural production, pricing and marketing.

Some contend that World Trade Organization is not the right venue for addressing these issues. Advocates counter that other key actors like the UN’s World Food Program, FAO’s Consultative Subcommittee on Surplus Disposal, the International Grains Council (sponsor of the Food Aid Convention) and the OECD’s Development Assistance Committee lack effective enforcement powers, whereas the World Trade Organization has them.

Safety Nets

The global economy has slowed with predictably adverse effects on developing countries. “Once, people simply relied on their local farmers. Today, we depend on a global web of growers, fisheries, packers, shippers, manufacturers, retailers as well

as government and industry bodies.”

(www.ibm.com/ibm/ideasfromibm/us/smartplanet/opinions).

Despite the sophistication of the food supply chain, hunger persists. The march toward middle-income status has decelerated.

The world's ecosystems are a source of livelihoods, clean water, fertile soil, biodiversity and energy. Clearly they must be protected and preserved in a manner that fosters sustainable social and economic development. Measures include conservation-oriented agriculture, integrated pest control, careful (as opposed to profligate) water use practices, and long-range forest and fisheries management. Water has been appropriated for agriculture, industries and cities, leading to competition within and among regions and unsustainable levels of consumption.

Forests cover about thirty percent of the world's land area and account for about eighty percent of Earth's biodiversity. (Consultative Group on International Agricultural Research, 2009:68). Forests contribute significantly to national and local economies, for example, through the sale of wood products and non-timber items like honey, nuts and resins.

However, traditional agriculture, fuelwood consumption and logging are the major causes of deforestation. Low income people have often accessed these resources for centuries in culturally embedded ways, for example through community forestry and water rights. Food insecurity leads farmers to overuse and eventually exhaust arable land and deplete water supplies. Two-thirds of tropical deforestation results from small-scale farming. (U.S. Agency for International Development, 1995:7). This calls for an alignment among the goals of sustainable development, food security and poverty reduction.

Rich country support for international aid programs has fallen off sharply. Developing countries are faced with stimulating food production through measures like price supports, subsidies to farmers (e.g. for seeds, fertilizers, irrigation systems) and the building up of reserve food stocks. (International Food Policy Research Institute, 2008:16-17).

Greater domestic production decreases a country's dependence on outside aid. But there are potential adverse effects like leakage of benefits, corruption, domestic and international trade distortions and phasing out of measures once objectives have been met. Coping with these requires administrative capacities lacking in most developing (and many developed) countries.

Hunger and poverty are becoming more urban in character. The majority of the world's poorest people are still found in rural areas. Increasing urbanization portends less emphasis on improving rural livelihoods and delivering food directly to the rural neediest.

Over the past two decades there has been a marked shift away from program food aid—which is seen as “an expensive, untargeted venture that primarily served geopolitical and surplus food goals” (Barrett, Christopher B., 2002:74). Total global food aid has dropped from over ten million tons in the 1990s to about 7.4 million tons in 2006. Having profited from hard experience, international organizations have instead embraced project and emergency relief aid using local purchases and triangular transactions where possible.

While one or more of these may be suited to particular local circumstances, e.g. emergency feeding to counter the effects of armed conflict or natural disaster, they share common downsides. They entail large administrative costs (targeting, eligibility determination, logistics, monitoring, etc.), distort local produce markets, and overly constrict a household's choices to food or food-related items without considering complementary assistance. In their fieldwork, GAO investigators found people with

HIV/AIDS in Wukuru, Ethiopia who sold part of their food rations to buy other essential items. Similarly In Kenya Somali and Sudanese refugees sold about four percent of their food rations to buy items like fuel, cooking utensils and clothes. (U.S. Government Accountability Office, 2007:53).

Such safety-net programs are inherently inefficient. The risk of corruption is high in countries where the capacity for administrative oversight is limited. It is harder to scale back or terminate such programs when the need diminishes. Programs created in response to a short-term need or sudden emergency live on well beyond the crisis period. They perpetuate dependency on outside assistance.

Food-based safety nets are advocated as a means of fostering food security. These can take the form of maternal and child health programs (with nutrition components); food stamps, coupons or vouchers; food-for-work programs; school feeding programs; consumer price subsidies; and emergency feeding programs. Nutrition education and medical referrals (such as are provided to participants in the U.S. Women, Infants and Children (WIC) program) aim at helping low income consumers in developing countries make the better, even if limited, food choices.

Safety-net programs can be general or target-specific. General safety-net programs are designed for society as a whole, target-specific programs for designated subgroups. At the general level, governments implement food-related measures like reducing tariffs on imports, restricting exports, cutting taxes, releasing supplies from stocks, and imposing price controls They can also act aggressively against hoarders and price speculators.

Such measures when effective serve to push prices down and increase consumption among net food buyers. On the negative side, food sellers lose income and governments are faced with revenue shortfalls and budgetary pressures. Benefits accrue to the wealthy (who could get along just fine without them) as much as or even more than the poor. Many developing countries lack the administrative capacity to enforce certain measures, e.g. export restrictions and price controls. In the short term food becomes more affordable but food productions incentives are diminished.

Target-specific programs can also take a variety of forms. For low income households, governments can provide consumer food subsidies. They can administer traditional means-based cash transfers or conditional cash transfers or CCTs (like Brazil's Bolsa Familia and Mexico's Oportunidades). Bolsa Familia (roughly Family Stipend) was formerly called Bolsa Escola (School Stipend) and Oportunidades began as PROGRESA.

In such CCTs, cash rather than food is provided to households—usually the mother—conditional on certain behaviors such as school attendance by children, consumption of micronutrient supplements by infants, attendance at health and nutrition sessions by mothers and periodic family health checkups. Other options include food stamps or vouchers, food-for-work public programs and higher public sector wages.

Target-specific programs are less costly than general programs and if implemented properly do indeed improve the health and nutritional status of vulnerable population subgroups. They suffer from being politically unpopular and require administrative capacity that is lacking in many countries. A persistent threat is leakage of benefits to unintended recipients. Works programs favor the healthy—healthy men in particular—and tend to exclude vulnerable groups like women, seniors, persons with disabilities, and persons with HIV/AIDS.

It is argued that with cash transfers consumers may make the “wrong” choices. Men, it is argued, are more likely to use the cash for non-nutritional purposes like

small business capitalization and income-generating investments or, at the other extreme, selfish pastimes like alcohol and gambling. Food-based programs controlled by women are more attuned to household nutritional needs, particularly those of children. (Rogers, Beatrice Lorge and Coates, Jennifer, 2002).

Food Security for All

The members of the G8 are Canada, France, Germany, Italy, Japan, Russia, United Kingdom, United States plus the European Union. At the G8 meeting in Hokkaido, Japan, July 7-9, 2008, leaders of these eight leading industrial nations declared: “[T]he steep rise in global food prices coupled with availability problems in a number of developing countries is threatening global food security. [This] could push millions more back into poverty, rolling back progress made towards achieving the Millennium Development Goals.”

(www.mofa.go.jp/POLICY/economy/summit/2008/doc).

The leaders also worried about the inflationary pressures on developing countries from rising food prices. “Until 2000, food prices were declining due to record harvests and the draw-down of food stocks.” However, “food prices have been rising since 2001, and quite sharply since 2006. The Food and Agriculture Organization index of food prices rose by 9% in 2006, 24% in 2007 and . . . 51% in [2008].” (United Nations High Level Task Force on the Global Food Crisis, 2008:8).

Why?

The most commonly cited factors are:

- rising oil prices affecting the cost of food production and distribution;
- increased use of crops for biofuels in the United States and Europe;
- higher meat consumption around the world;
- poor harvests in certain regions;
- underinvestment in agriculture generally;
- protectionist trade policies; and
- excessive speculation, e.g. in commodities futures markets.

(International Food Policy Research Institute, 2008:1).

For the developing world, the major staple crops are rice, wheat, maize, sorghum, barley, cassava, millets, oilseeds, banana or plantain, potato and sweet potato. These crops provide ninety percent of the food in developing countries and are the most affordable sources of protein and calories for low-income people.

Rising and volatile food prices caused by variations in supply mostly hurt low-income people whose diets are grain-based and who spend greater shares of their income on food. Global food security requires improved productivity and predictable pricing in these crops. (Consultative Group on International Agricultural Research (CGIAR)/Technical Advisory Committee, 2000: 26). At the same time, low-income people need the wherewithal to obtain, safely prepare and consume in sufficient amounts these and other vital food sources.

High prices are symptomatic of a deeper problem. In 2007 there was a global grain surplus for only sixty-one days of food consumption, the second lowest figure on record. (Bourne, Joel K., Jr., 2009:38). Grain production recovered somewhat in 2008 (to seventy days surplus) as farmers responded to the incentive of higher prices. But those same high prices increased the vulnerability of the world’s poorest people who spend half or more of their meager incomes on food.

With the addition of about seventy-five million people each year, the world’s population will surge from 6.7 billion currently to eight billion by 2025. From 2000 to

2030, the global food supply of cereals must increase by half and meat production by 85 percent to meet population growth demands.

Will it? Possibly, but the potential roadblocks include global warming, water shortages, conflict over land and water rights, disruption of trade flows, environmental degradation, soil erosion, water shortages, desertification, rapid urbanization, land conversion from agricultural to non-agricultural uses, disruption of biological cycles, increased demand for animal feedstocks and biofuels and uncertainty over the pace at which new agricultural technologies will be developed and adopted. (World Bank, 2007:8). The specter of war within and among nations ever hovers, threatening crops and food supply lines in the affected areas.

Production Prospects

There is room for cautious optimism. Per capita food production over the past half century has risen despite rapid population growth. More land has been put under cultivation and the production per unit of land has increased. Production has increased through innovations like the 1960s green revolution (development of high-yielding crop strains that respond strongly to inputs of fertilizer, pesticides and water) and the more recent gene revolution (genetically engineered commercial crops).

There is and should continue to be production of enough food to provide an adequate diet for everyone on earth. The breakdown in the farm-to-fork process may spring from various causes but global food shortage is not one of them.

The marketplace is where food is routinely obtained in exchange for money, goods or services. Yet not everyone gets enough food. “Hunger has increased as the world has grown richer and produced more food than ever in the past decade.” (Food and Agriculture Organization, 2008a:4). The essence of the breakdown lies in the lack of adequate purchasing power among the malnourished.

This is not invariably due to outright villainy. It’s simply that the private and personal interests of producers, traders, speculators and consumers overwhelm the goal of food security for all. Producers may curtail production in order to command higher prices. Traders will seek to maximize their profits as middlemen. In times of shortage, speculators may hoard supplies or divert them away from needy areas. Better-off consumers may bid up prices to the detriment of the poor. Governments may regulate too little, too much or just wrong-headedly. They may fail to plan for or competently cope with emergencies.

Growth in world agriculture “has decreased from 3% in the 1960s to 2% in the [1990s].” (Consultative Group on International Agricultural Research (CGIAR), 2000:2). Despite the downward trend, food production globally is expected to exceed population growth for at least another decade or so. In general “poverty and insufficient purchasing power rather than the lack of food supply is usually the main cause of food insecurity . . . ” (World Bank, 2007:112).

There are however serious regional threats. With declining production of staples, insufficient food availability can occur periodically in several agriculture-based economies in Africa, notably Burundi, Ethiopia, Kenya, Madagascar, Nigeria, Sudan, Tanzania, and Zambia, and to a lesser but still significant degree in Burkina Faso, Chad, Malawi, Niger, Rwanda, Uganda, and the Republic of Yemen. (World Bank, 2007:112).

Over the next decade, food security in some seventy developing countries—which account for seventy percent of the world’s population—is projected to deteriorate as

a result of a sustained slowdown in worldwide economic growth combined with food and fuel price hikes. (U.S Department of Agriculture/Economic Research Service, 2008: i, v).

Three-quarters of the world's poorest and hungriest people live in rural areas. About half are small family farm households (living on two hectares or less), a fifth are the rural landless, another fifth dwell in urban areas and a tenth are pastoralists, fishers and people whose livelihoods are dependent on forests. (UN Millennium Project/Task Force on Hunger, 2005:3-4).

Deficiencies in the quality, safety and diversity of one's diet can lead to micronutrient malnutrition and "hidden hunger" that cause illness, blindness, and premature death. (World Bank, 2007:95). Many of the cereals, roots and tubers that are staples of the poor are low in iron, zinc, and vitamin A. These micronutrients come rather from meat, fish, vegetables and fruits, food sources that the poor cannot afford. When either nutritious food is insufficiently available to hungry people or the food that is available costs too much, specific measures to assure access are needed.

Hunger violates a basic human right. The International Covenant on Economic, Social and Cultural Rights, which entered into force on January 3, 1976, obligates its signatories: "(a) to improve methods of production, conservation and distribution of food . . . [and] (b) to ensure an equitable distribution of world food supplies in relation to need." (Article 11). As of December 2008, the Covenant had 159 parties with seven other countries that had signed but not yet ratified it. Among the latter is the United States, which signed the Covenant in the Carter Administration (October 5, 1977) but which has never submitted it to the U.S. Senate for ratification.

"Equitable distribution" however is no guarantor of equitable access, particularly in developing countries. While international markets benefit a country's capital and perhaps its coastal cities, isolated rural areas often continue to suffer food shortages and household deprivation due to inadequate infrastructure (roads, bridges, shipping routes, etc.) and high transport costs.

XV. Cash As An Answer

An Urbanized World

The world's population is increasingly urban in character. City dwellers outnumber their rural counterparts for the first time in history. One sixth of the world's population, mostly in the rural areas of developing countries, lacks access to safe drinking water and one-third lacks adequate sanitation. These conditions inhibit the establishment of food and agricultural markets in rural areas. Rural communities, where livelihoods depend on agriculture and related processing, trade and services, "are often remote and culturally distinct from urban 'consumer society.'" (Food and Agriculture Organization, 2007:4).

For urban dwellers, the global food chain from farm land to dinner table has grown longer and more circuitous. Pests and diseases have more points of entry. While undeniably convenient and affordable, many foods sold at supermarkets are loaded with sugar, salt, saturated fats and cholesterol. The quality and nutritional value of food are at risk, as we have seen in recent years with outbreaks of bird flu (avian influenza) and mad cow disease. (bovine spongiform encephalopathy).

Agriculture is essential to human well-being. But as practiced in many areas it has contributed to land degradation, depletion of water resources, air and water pollution, loss of habitat and reduced biodiversity. Big agro-industrial enterprises control seed markets. They take over large land holdings that are at times ruined through overuse of pesticides and monoculture. Small farmers lose their land and must become seasonal workers on large plantations or low-wage urban job seekers.

Surpluses from rich countries that are distributed as food aid can be counterproductive. They can change local eating habits and discourage local food production. None of these problems is insurmountable. We can hold on to the baby while throwing out the bathwater.

Ten Countries, Twenty-seven Countries

Over half the world's population lives in just ten countries. Almost two-thirds of the world's undernourished people live in those same countries. (See Appendix 5.) The ten are dominated by India and China. Fortunately in both the economy has been surging in recent years and their governments are making strides in reducing the proportion of their malnourished people.

A different perspective pops out when we take countries with the highest proportion of undernourished people independent of population size. (See Appendix 6.) If we arbitrarily select countries where the proportion of undernourished is at least 30 percent of the population, we produce a list of 27 countries. Collectively these countries account for "only" a quarter of the world's undernourished people. But the individual country proportions are staggering. Three-quarters of Eritrea's populations is undernourished. Thirteen countries have proportions that are 45 percent or higher. Arguably here is where the world's attention needs to be focused.

Pakistan, Thailand and Viet Nam face major challenges but appear to be making headway in providing long-term food security. Brazil and Indonesia stand out for small single-digit *proportions* but still relatively large *numbers* of their total populations who are food insecure. Countries like the Democratic Republic of the Congo, Ethiopia and Bangladesh with large numbers of malnourished people and high proportions at 72, 46 and 30 percent respectively have much further to go.

The countries that appear on both Appendix 5 and 6 are noteworthy for having high absolute numbers and high proportions of undernourished people: Bangladesh (43.1 million, 30 percent), Democratic Republic of the Congo (37 million, 72 percent), and Ethiopia (31.5 million, 46 percent). Together they are home to 111.6 million malnourished people who make up 42.3 percent of their combined total populations.

Population and Progress

An international safety net is required for nations whose internal food supply falls short for whatever reason—drought, civil conflict, war or population pressures. Gains in agricultural productivity will be needed as the world's population climbs from its present 6.4 billion to almost ten billion by the middle of the century. This means investment in agricultural research (particularly biotechnology), infrastructure, education and sustainability. Complementing these investments is a fair, market-based global trading regimen that fosters food security. Notwithstanding all this, people need the wherewithal to obtain food.

There has been progress. In fact there has been so much progress that there is no excuse for not finishing the job—achieving 100% food security. In 1800 the world's population was less than one billion; by 2000, it exceeded six billion. Agriculture did more than keep pace by increasing at least tenfold. (Federico, Giovanni, 2005:1). Over the past half-century, global food production has continued to grow at a faster rate than global population. Per capita consumption has increased thanks to more intensive agriculture and new crop varieties.

From 1950 to 2000, the world's population grew by 140 percent. Food production grew by 160 percent. In 1950 the mean daily intake of the world's 2.5 billion people was 2,450 calories. By 2000, despite a population exceeding six billion, the mean intake was around 2,700 calories. (Food and Agriculture Organization, 2000:Part II). Dietary patterns in developing and emerging economies are moving away from starchy foods towards meat and dairy products. Overproduction has become a large issue in rich countries.

After World War II, members of the Organization for Economic Cooperation and Development (OECD), wealthy countries all, experienced high rates of growth in Total Factor Productivity.

A word or two about Total Factor Productivity (sometimes called Multi-factor Productivity) as related to agriculture in particular. Essentially productivity measurement relates output volumes to input volumes. Output rests at a minimum on constant input variables like land, labor, capital and scale. But other less dependably constant variables affect it as well, e.g. weather, efficiency, and technology. Take all these variables together and you have TFP.

Technology, a “residual” in mathematical production functions, is widely seen as the key growth driver in modern economies. A distinction is often made between embodied and disembodied technical change. The former (e.g. machinery, equipment, work processes) is a function of capital investment and market dynamics. Disembodied technical change (e.g. scientific breakthroughs, better methods of organizing and managing, speedier means of diffusing information) that operate on a society-wide scale are “free” for all. Both forms of technology contribute to productivity growth but it is useful to capture their effects separately. (Organization for Economic Cooperation and Development, 2001:115).

At any rate, Total Factor Productivity has fueled an enormous increase in agricultural output that has benefited developed and developing countries alike. (Federico, Giovanni, 2005:221). In 1961, 1.755 billion people—57 percent of the

world's population—consumed fewer than 2,200 calories a day; by 1995, the numbers had fallen to 520 million and 9 percent respectively. (Fox, James W. 1998:7). “Global per capita food production has increased 15 percent in the past twenty years despite a 45 percent increase in the world's population over the same period. . . .” (Barrett, Christopher B., 2002:27).

Agricultural research and development coupled with extension services have played a major role in fostering global food security. That is progress that developing nations and the international community as a whole can point to with pride. Even more encouraging, the increase over time of the food production-to-population ratio is accelerating aided (it seems) by cascading developments in irrigation, mechanization, land cultivation practices, use of chemicals (e.g. for fertilizers and insecticides), animal husbandry and high-yielding plant varieties.

Farming has become more productive, transportation costs have fallen and food preservation techniques have improved. The prices of corn, wheat and rice fell by about half between the late 1950s and early 1990s. In developing countries, despite its adverse effects (e.g. environmental stress, overemphasis on monoculture, greater wealth and income disparities), the green revolution of the 1970s and 1980s ushered in an era of increased agricultural productivity, reduced food prices and lifted the incomes of many small farmers. (McLaughlin, Martin, 2002:187n36).

In many developing countries, where unemployment rates are high, targeted food assistance often comes with work requirements. Governments and nongovernmental organizations alike administer such food-for-work programs. Participants take on low paying labor-intensive public works jobs to meet their food needs. Ideally food-for-work schemes not only meet the nutrition needs of participants but also create physical infrastructure (e.g. new or repaired roads) that can have a longer-term payoff. The effectiveness of this approach on the ground however is subject to debate.

Labor-intensive work is best performed by the able-bodied, thus ruling out malnourished individuals with severe illnesses, chronic medical conditions or disabilities. Enough equipment and material needed for projects may not be forthcoming due to political pressure, administrative incompetence or outright corruption. Whether those performing the work and their families actually receive enough of the right kind of nourishment as a result of their participation is an open question. (Barrett, Christopher B., 2002:39-40).

The world's agricultural economy has changed radically since the passage of P.L. 480. The world's ability to feed itself has improved substantially due to more intensive agriculture, new crop varieties and, until recently, falling prices. Despite progress in many developing countries, the global distribution of food supplies is uneven and hunger on a large scale persists.

We are now witnessing the rapid spread of a “gene revolution.” Spurred by the Human Genome Project, researchers have vastly improved their understanding of how all forms of life (humans, animals, plants, microbes) function at the molecular level and have increased their ability to manipulate DNA sequences. CGIAR researchers and others are working to identify and control the genes that govern agriculturally important traits.

Plant breeders now improve crops by incorporating beneficial traits from other species. For instance, so-called Bt varieties of cotton, maize, rice and other plants resist insects like borer beetles. (Raney, Terri and Prabhu Pingali, 2007: 10406). Bt refers to the soil bacterium *Bacillus thuringiensis*, a gene from which is transferred to plants. Iran has approved Bt rice for commercial cultivation; China appears close to

doing so. Transgenic Golden Rice has been developed and adapted locally to meet the nutritional needs of undernourished people in a number of countries. The rice was literally designed to address vitamin A deficiency, the cause of blindness often leading to death in hundreds of thousands of children around the world. The rice is “golden” because vitamin A has been engineered into it, giving off a golden color. (Patel, Raj, 2007:136-37).

The planting of transgenic crops is greatest in the U.S. (with 54 percent of all plantings) but is spreading rapidly elsewhere, notably Argentina, Brazil, Canada, China, India, Paraguay and South Africa. Golden Rice was developed by Ingo Potrykus, Swiss Institute of Technology; Peter Bergen, University of Freiburg; and a “network of academic and humanitarian organizations.” (Patel, Raj, 2007:136-37).

By generating new crop varieties, biotechnology opens the way to much higher yields, greater tolerance to drought and reduced use of fertilizers. According to Robert Fraley, Monsanto’s chief technology officer, “We are now poised to see probably the greatest period of fundamental scientific advance in the history of agriculture.” (Bourne, Joel K., Jr., 2009:48).

A note of caution. While the green revolution was launched by foundation-funded and public-spirited nonprofit entities, many discoveries in the gene revolution are made by researchers within capital-intensive, profit-driven transnational corporations. The latter’s assertions of intellectual property rights may at a minimum delay the spread of the new biotechnologies to poor communities. And the green revolution was not problem-free. Its technologies fostered overuse of fertilizers and pesticides, lowered water tables and depletion of soil nutrients.

For that and other reasons there is a growing demand for more ecologically friendly agriculture that benefits not just large agribusinesses but the world’s 900 million small farmers as well. (Bourne, Joel K., Jr., 2009:56).

Dropping Proportions, High Absolute Numbers

It is likely that the poor have benefited from the increases in national average calorie consumption. The increases have not gone wildly disproportionately to the rich. First, inequality in calorie distribution is inherently less pronounced than in, say, in income distribution because, unlike the case of money, “there is an upper limit to the desire of most people for additional calories.” (Fox, James W., 1998:7).

Second, aggregations of household survey data across countries yield evidence of improved nutrition among the poor. Survey data are the best available source for determining the household consumption of food over time. Because of a host of methodological issues (e.g. sampling methods, high enough response rates, effective sample sizes, questionnaire formatting and question content, database development), aggregating such data across countries to build a global picture is tricky business. But even if the data lack the desired micro-level precision, they can at least point to broad trends.

Based on survey data analysis, the proportion of undernourished people in developing countries dropped from an estimated 35 percent (918 million people) in 1969-71 to an estimated 20 percent (854 million) in 2001-2003. About 70 percent of the undernourished live in rural areas. Some adults survive as small farmers. Others who are landless often cannot find work and when they do it is for low wages. Some of the undernourished have no families. Still others suffer from illnesses like HIV/AIDS, leaving their children without providers.

Natural and man-made disasters like droughts, floods, war and bad government can push those on the edge over it. Almost one in five (18 percent) of the

undernourished are children under age five. (Pinstrup-Andersen, Per and Fuzhi Cheng, 2007:97-98).

According to the Food and Agriculture Organization, the world could meet the Millennium Development Goal of halving the *percentage* of hungry people by 2015 but, because of population growth, still fall short of the World Food Summit's goal of halving the *number* of hungry people. The World Food Summit goal is a reduction to 412 million hungry people by 2015 whereas the FAO projects 582 million by then.

Even if the WFS goal were met, the continued existence of some 400 million hungry people is hardly cause for celebration. (Food and Agriculture Organization, 2006:8). That will take longer though it is achievable. The number of undernourished people in the developing (not the entire) world could conceivably fall from about 800 million in 1999-2001 to 470 million in 2030 to 300 million in 2050 even as world population grows by 40 percent. (Food and Agriculture Organization, 2007:134. My figures are the obverse of what the text reports.) Meanwhile the world will be roiled by periodic hunger shocks.

The Food and Agriculture Organization produces an annual list of Low-Income Food-Deficit Countries. The list is constructed using three criteria: 1) a country's per capita income relative to the historical ceiling (currently \$1,575) for certain types of World Bank assistance; 2) a country's three year average net food trading position (imports minus exports); 3) removal of a country from the list at its request despite meeting the first two criteria. Otherwise a country is not removed from the list until it meets the first two criteria for three consecutive years, during which time its status is considered to be transitional. (www.fao.org/countryprofiles/lifdc.asp?lang=en). See Appendix 3.

"Hunger and malnutrition are not removed by food supplies alone; health, education, and other services are needed, with planning to ensure that nutritionally appropriate foodstuffs are available locally at prices which can be afforded." (Independent Commission on International Development Issues, 1980:97). What this suggests is that "[m]alnutrition is intrinsically a local problem." (Berg, Alan, 1987:104). Self-reliant communities are better able to withstand shocks over which they have no control—drought, flooding, civil conflict, war, corrupt governance, shifting political winds, and global economic forces.

World population continues to grow by one hundred million people a year, mainly in developing countries where hunger and malnutrition are most prevalent. The most vulnerable areas are South Asia and sub-Saharan Africa. Alignment is needed between population growth and food supplies. While enough food is produced to meet the world's needs, in parts of the world chronic food shortages persist at the country, regional and community levels.

Food aid, whether provided in-kind or monetized, cannot by itself overcome chronic food insecurity. It requires complementary interventions to increase agricultural productivity, assure the most vulnerable of access to food stocks and promote household nutrition.

"It is hardly possible to imagine a famine that might not have been—or could not be—alleviated by more generous transfers from the rich to the poor." Markets, however efficiently they run, cannot by themselves "override mismatches between entitlements and market position." (Ó Gráda, Cormac, 2009:193).

People can acquire food by growing it, working for it, buying it and/or being given it. (Devereux, Stephen, 2000:19). Where growing is not feasible (e.g. households in crowded urban settings), opportunities for work are lacking, and purchasing power is insufficient, the only remaining option is to give food to people.

However, among the three preceding options, one is more easily remedied than the others. Purchasing power can be increased by the simple expedient of transferring cash to needy households.

Cash assistance proposals typically run up against the objection that food insecure households will not spend the money for its intended purpose. Men are often cast as the villains here. With a windfall of cash, they may feed themselves but shortchange their families, invest in hopeless enterprises, gamble away the money or waste it on alcohol.

Programmatically the “leakage” or outright diversion of cash to non-food purposes is considered a high risk compared to direct food aid. In the channels through which aid flows from donor nation to recipient nation to local communities to individual households, the specter of corruption hovers.

These essentially patronizing attitudes conflict with the greater policy emphasis on the “empowerment” of food insecure households, who are seen as recognizing their own best interests and as responsible for their own welfare once they have the tools and resources in hand. And direct food aid itself is not invulnerable to leakage, corruption and distortion of local markets.

Giving cash to people is faster, less costly and more empowering than distributing food to them. Recipients have more flexibility in obtaining their preferred amounts and types of food. They may even choose to use some or all of the money to buy non-food items—tools, clothes, animals, seeds—which enhance the household’s overall security. Or they may indeed waste it. The nature of empowerment is that people can make choices that others—including donors—may not approve of.

An infusion of cash can stimulate trade, markets, investment and other economic activity. In areas where famine or food shortages occur, there are often localized surpluses. Increased purchasing power can motivate local traders to liberate those surpluses, transport them to areas of need and sell them to food shortage households.

Cash is more efficient and less damaging to local markets than direct food aid. Supply follows demand and cash converts demand from an unrealized longing into an economic reality.

To be sure, prices may at times spike up as traders seek to recover their costs and maximize profits. Governments may need to curb inflationary pressures through regulation and enforcement or by intervening with supplies from their own food reserves or those of foreign donors. But not inevitably.

The bargaining power of the poor will increase, particularly those with access to new communications and transfer technologies (cell phones, smart cards, ATMs). With money in hand the hungry will find food they can afford to buy. Just like the rich.

Appendix 1. Food and Agriculture Organization

An Australian economist, businessman and public servant, Frank McDougall, who had been active in public health in the League of Nations, was among the first to tout the connections among personal health, nutrition, agriculture and economic development. In exploring ways of assuring that human beings everywhere had a proper diet, he determined that world food supplies would need to double and that rich nations would have to assist poorer ones. He persuaded his own government that improving nutrition worldwide would increase demand for Australia's agricultural exports. (O'Brien, John B., 2002:164-174).

In 1942 he wrote a memo "A United Nations Programme for Freedom from Want of Food" in which he urged creation of an international organization on food and agriculture. The phrase "United Nations" in the memo's title referred to wartime allies. The title also elaborated on the "freedom from want", one of President Franklin Roosevelt's "Four Freedoms" which he proclaimed in his 1941 State of the Union address. (The others were freedom of speech and expression, freedom of religion, and freedom from fear.) The Food and Agriculture Organization, an organ of the United Nations, came into being in 1946.

The assets of the International Institute of Agriculture, which had been founded in 1905 by David Lubin, were transferred to the new Food and Agriculture Organization. (en.wikipedia.org/wiki/David_Lubin).

In 1951, FAO's headquarters were moved from Washington, DC to Rome. A year later, its new library was named after David Lubin. The Food and Agriculture Organization continued Lubin's pioneering effort to foster international cooperation in agriculture. Initially the organization emphasized the education of farmers, dissemination of new agricultural technologies and promotion of food production. Its reach spread beyond war-torn areas to newly independent nations like India, Pakistan and Indonesia. (Food and Agriculture Organization, 2007d: 54). From there its reach has become totally global.

Appendix 2. U.S. Food Aid

To address huge post-war (and price-supported) food stocks—a stark contrast to hunger and malnutrition elsewhere—under President Eisenhower, the U.S. government enacted the Agricultural Trade Development and Assistance Act of 1954 (P.L. 480). Amended several times, it has served as the template for the nation's foreign food aid program. Titles I, II and III programs were established in 1954.

As currently constituted, *Title I* provides for government-to-government sales of U.S. agricultural commodities to developing countries on low interest credit or grant terms. It is managed by the U.S. Department of Agriculture.

Title II (Food for Peace) authorizes donation of U.S. agricultural commodities to meet emergency and non-emergency food needs in other countries. Commodities may be furnished by the Commodity Credit Corporation. The U.S. Agency for International Development manages the program.

Under *Title III* (Food for Development) government-to-government grants are intended to support long-term growth in the least developed countries. Donated commodities are sold on the domestic market in the recipient country, and the revenue is used for economic development programs. The program, which is managed by the U.S. Agency for International Development, has not been funded in recent years.

Title IV, added in 1959, extended credits to foreign governments to purchase surplus commodities. In 1962 Title IV credits were further extended to private commercial trade. (Shaw, D. John, 2007: 49-50).

Section 416(b) provides for overseas donations of surplus commodities owned by the Commodity Credit Corporation to carry out assistance programs in developing countries and friendly countries. That program is inactive as of this writing due to the unavailability of government-owned commodities. However, being permanently authorized it can be readily restarted. (U.S. Government Accountability Office, 2007: 68fn).

Food for Progress, authorized in 1985, assists countries to expand free enterprise in their agricultural economies through changes in commodity prices, marketing, input availability, distribution and private sector involvement. The Commodity Credit Corporation (CCC) finances the sale of agricultural commodities through grants or credit to developing countries and emerging democracies. Created in 1933, the CCC is a government-owned and operated corporation whose goal is to protect farm incomes and prices. Initially affiliated closely with the Reconstruction Finance Corporation, it was transferred in 1939 to the U.S. Department of Agriculture under its Farm Service Agency.

The *McGovern-Dole International Food for Education and Child Nutrition Program*, established in 2003 and managed by the U.S. Department of Agriculture, provides for donations of U.S. agricultural products, as well as financial and technical assistance, for school feeding and maternal and child nutrition projects in low-income countries.

Other legislative food aid authorities are found in the Food for Progress Act of 1985 and Section 416(b) of the Agricultural Act of 1949. Amendments to these authorities are contained in Title XV of the Food, Agriculture, Conservation, and Trade Act of 1990 (FACT Act).

(www.fas.usda.gov/excredits/FoodAid/Title%201/pl480ofst.html).

Appendix 3. Selected NGOs

Agriculture Cooperative Development
International/Volunteer Overseas
Cooperative Assistance (ACDI/VOCA)
Adventist Development and Relief Agency
International (ADRA)

Africare
Amigos Internacionales
Breedlove Dehydrated Foods
CARITAS
Catholic Relief Services (CRS)

Catholic World Services (CWS)
Cooperative for Assistance and Relief Everywhere, Inc. (CARE)
Center for International Health
Child Life International
Church of Bible Understanding

CitiHope International
Evangelistic International Ministries
Fabretto Children's Foundation,
Food for the Hungry, Inc. (FHI)
Global Hope Network International

Global Transitions, Inc.
Healing Hands International
International Committee of the
Red Cross (ICRC)
International Medical Corps

International Relief and Development
International Relief Teams
Mercy Corps
Norwegian People's Aid (NPA)
Opportunities Industrialization Centers

International, Inc. (OICI)
Project Concern International (PCI)
Proyectos en Informática, Salud,
Medicina y Agricultura (PRISMA)
Relief Society of Tigray (REST)

Salesian Missions
Samaritan's Purse (SPIR)
Save the Children Federation, Inc. (SCF)
Self-Help and Resource Exchange (SHARE)

TechnoServe, Inc.

World Food Program (WFP)
World Vision-US (WVUSA)

Source: U.S. Agency for International Development, 2004.

Appendix 4. Food Deficit Countries (2011)

Africa	Africa (cont'd)	America
Benin	Togo	Haiti
Burkina Faso	Uganda	Honduras
Burundi	United Rep. of Tanzania	Nicaragua
Cameroon	Zambia	Oceania
Central African Republic.	Zimbabwe	Kiribati
Chad	Asia	Papua New Guinea
Comoros	Afghanistan	Solomon Islands
Congo	Bangladesh	Tuvalu
Côte d'Ivoire	Bhutan	Vanuatu
Dem. Rep. of the Congo	Cambodia	
Djibouti	Dem. People's Rep. of Korea	
Egypt	Georgia	
Eritrea	India	
Ethiopia	Indonesia	
Gambia	Iraq	
Ghana	Kyrgyzstan	
Guinea	Lao People's Dem. Rep.	
Guinea-Bissau	Mongolia	
Kenya	Nepal	
Lesotho	Pakistan	
Liberia	Philippines	
Madagascar	Sri Lanka	
Malawi	Syrian Arab Republic	
Mali	Tajikistan	
Mauritania	Timor-Leste	
Mozambique	Turkmenistan	
Niger	Uzbekistan	
Nigeria	Yemen	
Rwanda	Europe	
San Tome and Principe	Rep. of Moldova	
Senegal		
Sierra Leone		
Somalia		
Sudan		
Swaziland		

Appendix 5. Countries with Highest Number of Hungry (2001-03)

Country	Pop. (Millions)	Under-nourished (Millions)	Under-nourished (Percent)
India	1060.0	212.0	20
China	1250.0	150.0	12
Bangladesh	143.7	43.1	30
Dem. Rep. the Congo	51.4	37.0	72
Pakistan	153.0	35.2	23
Ethiopia	68.5	31.5	46
Brazil	180.0	14.4	8
Indonesia	230.0	13.8	6
Viet Nam	81.2	13.8	17
Thailand	63.8	13.4	21
TOTAL 10 Countries	3281.6	564.2	17
World	6117.1	856.4	14
TOTAL as % of World	53.6%	65.9%	n/a

Source: Adapted from Food and Agriculture Organization (2007) 189-93.

Appendix 6. Countries with Highest Proportion of Hungry (2001-03)

Country	Pop. (Millions)	Under- nourished (Millions)	Under- nourished (Percent)
Eritrea	4.0	2.9	73
Dem. Repub. the Congo	51.4	37.0	72
Burundi	6.7	4.5	67
Comoros	0.8	0.5	62
Tajikistan	6.2	3.8	61
Sierra Leone	4.8	2.4	50
Liberia	3.3	1.6	49
Haiti	8.1	3.8	47
Zambia	10.9	5.1	47
Ethiopia	68.5	31.5	46
Central African Republic	3.8	1.7	45
Mozambique	18.4	8.3	45
Zimbabwe	12.7	5.7	45
Angola	13.2	5.0	38
Madagascar	17.1	6.5	38
Guinea-Bissau	1.4	0.5	37
Yemen	19.2	7.1	37
Rwanda	8.3	3.0	36
DPR Korea	22.6	7.9	35
Congo	3.5	1.2	34
Malawi	11.8	4.0	34
Cambodia	13.9	4.6	33
Chad	8.2	2.7	33
Niger	11.6	3.7	32
Kenya	31.3	9.7	31
Bangladesh	143.7	43.1	30
Botswana	1.7	0.5	30
TOTAL 27 Countries	506.8	208.3	41
World	6117.1	856.4	14
TOTAL as % of World	8.3%	24.3%	n/a

Source: Food and Agriculture Organization (2007) 189-93

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