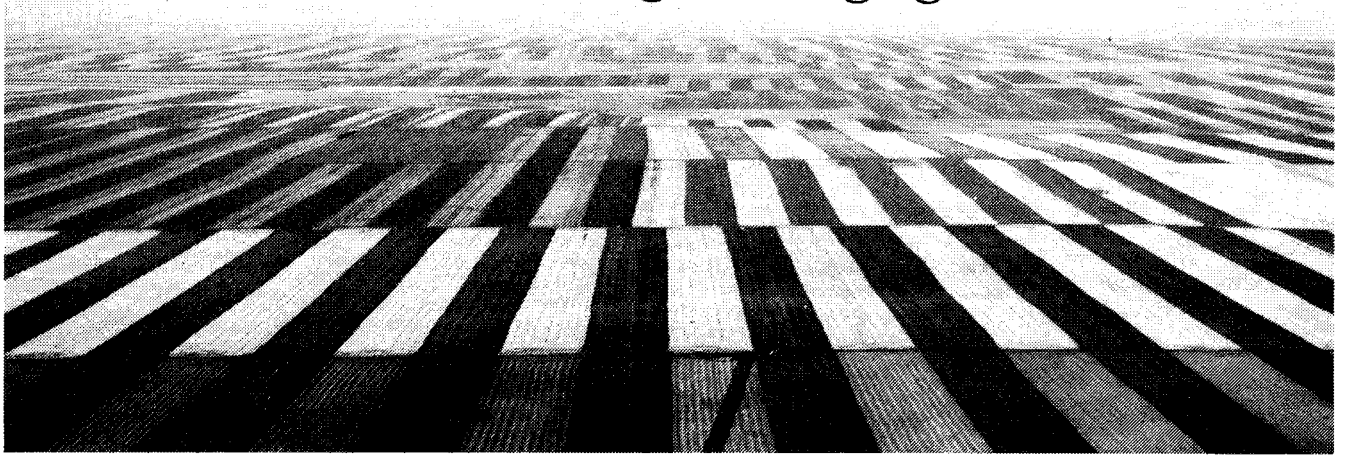
Part II

The Mexican challenge: managing the boom



Mexican agriculture: only American methods will work

This survey was prepared by Cecelia Soto-Estévez and Patricio Estévez of the Mexican Association for Fusion Energy, Calvin Larson of the U.S. Fusion Energy Foundation, and Elsa Ennis.

During the first week in August the Mexican press was filled with official statements and counterstatements about a suspicious series of train accidents that involved freight cars transporting imported grains from the United States. The nervousness of the government reflected concern not only about these particular events, but more deeply, about the known fact that Mexican agriculture is in one of its gravest crisis and threatens to dramatically slow down that country's ambitious industrial strategy. This is also the reason why: high government officials, including the agriculture minister, several weeks ago suggested that a possible U.S. role in aggravating the present programs through hurricane control, be investigated. In fact, the second consecutive year of severe drought has broken the back of Mexico's long troubled agricultural sector.

During 1979 there was five times less rain than the average. The results were catastrophic. Agricultural production fell by 7 percent, after an increase of 4 percent the preceding year. Basic grain production decreased by 20 percent.

As a result, Mexico has found itself in a bind of grave strategic as well as economic dimensions. If it answers these shortfalls with increased imports year after year, it will divert the oil revenues it needs for industry. Mexico's leaders refer to this as the danger of "eating the oil." They highlight the potential danger to national security if a foreign supplier—which as of now is just one country, the United States—should use the threat of food cutoff as a weapon against the country.

On the other hand, not importing to cover the shortfall could immediately trigger real food shortages and widespread social disturbances.

While Mexico moves to implement a vast new program focusing on the agricultural problem known as the Mexican Food System (SAM), it has no real choice but to import to cover immediate needs.

This year Mexico will import 9.5 million tons of basic grain, the bulk of it for desperately needed animal feed as domestic stocks are depleted for human consumption. This is 40 percent more than in 1979 and 150 percent more than in 1978. Moreover, this massive increase in imports adds tremendous pressure to one of Mexico's most important bottlenecks, transportation. Last June a spokesman for the Mexican Commerce Ministry reported that American cities near the Mexican border were flooded with "more than 1,000 leased boxcars containing basic grains that cannot move due to the lack of locomotives." The transportation effort alone is going to cost a quarter of a billion dollars.

The PNDI and the PGD

Last year's collapse of agriculture forced a dramatic shift of priorities upon the Mexican government. A comparison of the March 1979 National Industrial

Development Plan (PNDI) with the April 1980 National Global Plan (PGD) (see diagram), shows that the agricultural sector will be allocated nearly double its original share of the oil revenues at the expense of the industrial sector, which will receive only half its slated share. This happens at a moment when the far-reaching plans for superports, capital goods and steel development are awaiting major appropriations in order to move forward.

It is common knowledge among informed circles that the PNDI elaborates López Portillo's own long-treasured strategy to reorient Mexican economic development through an aggressive program of basic industrialization. In fact, the PNDI, though one of several sectoral plans, was the first one adopted and was conceived as the anchor for the rest of the package, going into the Global Plan.

In the chapter dedicated to agriculture, the PNDI warns that if this sector does not achieve a minimum 3 percent annual growth (barely keeping pace with population growth) then by 1982, 21 percent of oil revenues would have to be diverted to food imports and 54 percent by 1990.

But there was no need to wait for 1982. According to the central bank figures, 21 percent of oil revenues, $800 million, went to pay food imports during 1979. Basic grain imports for 1980 will skyrocket to $1.8 billion, accounting for only 15 percent of oil revenues because higher oil prices and higher exports will up revenues from 4 to $12 billion.

Returning to the comparative bar diagram of the two programs: Pemex, the national oil company, receives the same percentage indicated by the PNDI a year and a half ago. Besides agriculture, the sector that receives a substantial increase in its share of the oil revenues is the social sector (education, housing and health), which increases its share from 12 to 16.3 percent. This fact reflects the heavy immediate price that the Mexican government is paying to bridge a gap of "rising expectations," which is being actively exacerbated by political opponents, particularly Jesuit-led left groupings. The PNDI argued strenuously that only a high capital-formation rate could guarantee continued prosperity; therefore the much-needed increases in social programs would have to wait until 1983.

Historical data

It is undoubtedly true that more money had to be allocated for agriculture. But as we demonstrate below, the SAM avoids the fundamental issue of major new water projects and places disproportionate emphasis on low-efficiency marginal peasant farming. With luck it can only guarantee a small and temporary increase in agricultural production—at the cost of fully half the oil revenues otherwise tagged for industry.

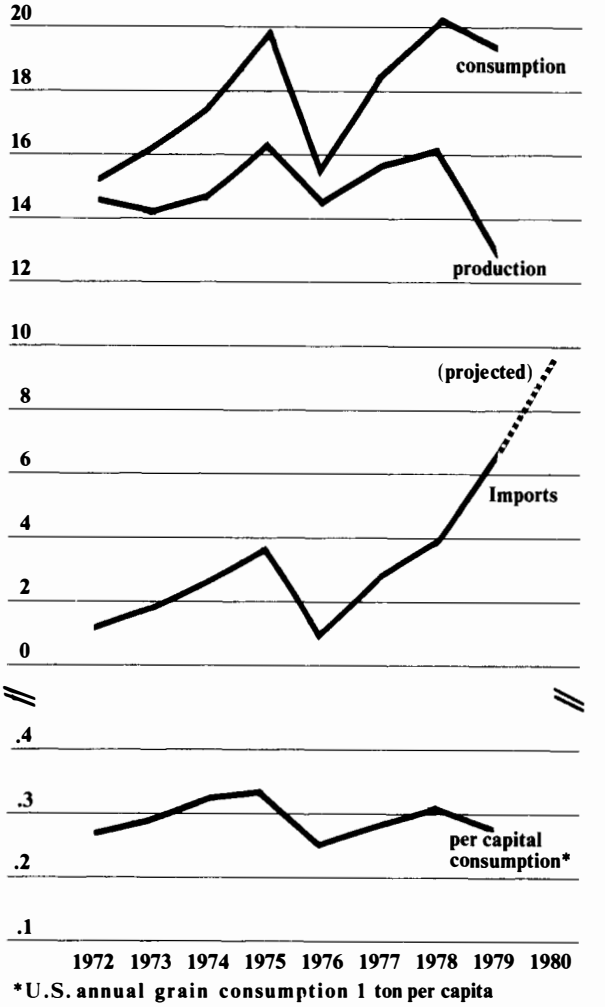
Solving the Mexican agriculture debacle is indeed a great challenge. Since 1965 there has been a persistent stagnation in the volume produced, as shown in Figure 1. During the 1965-76 period, production grew by a meager 0.86 percent annually. Even with rising food imports, per capita consumption first remained flat and then fell as a result of the inability to keep pace with a population growing at 3.5 percent per year, one of the highest rates in the world.

The last year of President Echeverria's term, 1976, a year marked by capital flight and external destabilization efforts, was also a year of agricultural collapse. Production of basic grains fell by 8 percent resulting in an overall negative growth of 4 percent. Significant gains in 1977 and 1978 have now been offset by the 1979-1980 drought. Hardest hit have been corn and beans, the main ingredients of the Mexican popular diet. The growing deficit in basic grains consumption has resulted in a dramatic lowering of caloric consump-

FIGURE 1

Grain production and consumption

(Millions of metric tons)



*U.S. annual grain consumption 1 ton per capita

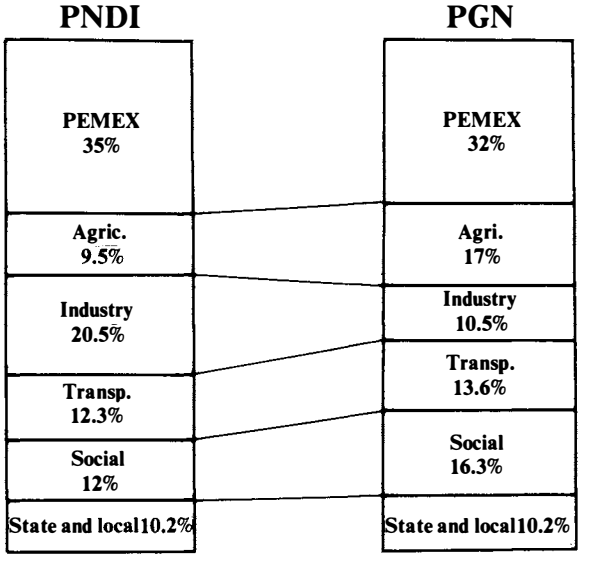
tion. Among the poorest strata of peasants and Indians it has fallen from the already low 1,900 calories per day to the bare survival level of 1,600.

Correlatively, the figure for average hectarage cropped has stagnated at 14.5 million hectares since 1965. A growing disproportion between the price support structure and the price of agricultural inputs has resulted in a reduction of the areas devoted to basic grain crops, in favor of cash crops cultivated in the capital-intensive northwest agricultural zone. While prices of fertilizers and agrochemical products have moved sharply higher since 1965, support prices were frozen until 1972 and still represent a problem.

Private credit has concentrated on the cash crops exported to the United States. It is argued that the resulting $1.8 billion in revenue maintains an agriculture trade balance, but with the increasing imports, most of these profits return to U.S. banks as deposits or are diverted from new investment in basic grains. It is clear, therefore, that such exports do not constitute an answer to the problem.

FIGURE 2

Allocation of oil revenues, 1980-82



Sources: The PNDI (National Industrial Development Plan) was issued in February 1979, and calculated oil revenues at $37 billion for the three year period. The PGD (Global Development Plan) was issued in March 1980, and calculated oil revenues at $42 billion.

Note: The "PEMEX" allocation includes investment in oil and petrochemical projects. The industry category includes all other industrial outlays.

An ambitious new program

The competitiveness of agricultural production demands mechanization and hence the expulsion of rural labor from the countryside. Remember that in the United States the agricultural labor force is scarcely 4 percent of the total and it is the most efficient agriculture in the world. That is the direction that any agriculture must go, if it is to be worthy of the name.

—José López Portillo to members of the American press corps June 27, 1980.

The Fusion Energy Foundation and its cothinker organization, the Mexican Association for Fusion Energy (Asociación Mexicana de Energía de Fusión—AMEF), have jointly developed an agricultural program for Mexico based on capital-intensive American agricultural methods recommended explicitly by Mexican President López Portillo.

The program is the result of a broader joint research project led by FEF director of research, Dr. Uwe Parpart, to apply the LaRouche-Riemann econometric model to elaborate an overall development program for Mexico. The agricultural program, of which we present here a condensed version, was developed by agricultural engineer Calvin Larson, and Patricio and Cecilia Estévez, director of agricultural research and executive director of the AMEF respectively.

* * *

Mexican agriculture can match the productivity of present U.S. agriculture by the year 2000, and surpass it by the year 2020 if, as recommended by President López Portillo, that country follows a program based on the methods which made the U.S. farmer the most productive food producer in the world. As the U.S. case shows, increased productivity in industry requires concurrent increases in the quality of food consumption, clothing, housing and general cultural education of the workforce.

Only a highly productive agricultural base can provide this industrial requirement, while at the same time freeing large numbers of workers from the drudgery of menial subsistence agriculture to gain higher levels of employment in the advancing industrial base.

The key to the economic effectiveness of capital-

intensive U.S. agriculture is the thermodynamics of energy throughput; that is, the net surplus energy generated that is available for reinvestment. The comparison of the three modes of agricultural production that coexist in Mexico is useful as a measure of the relative thermal efficiency of each mode.

First, there is the modern agricultural sector, with capital-intensive methods and irrigated land. Second, there is the relatively efficient rainfed sector. Third, there is the subsistence agricultural sector of Indians and backward peasants.

"Traditional agriculture," that is, subsistence agriculture, represents a monstrous waste of energy, literally consuming the flesh and blood of 13 million peasants to produce a mere 1,600 calories per day diet for only six months of the year. The low energy throughput that characterizes the subsistence level, results in less *efficient* energy use, consuming more energy per ton produced than the other two systems (see Figure 3).

A thermodynamic study also shows that virtually every increase in energy throughput for the two relatively advanced agricultural sectors with irrigation, agrochemical products, fertilizers or mechanization results in a nonlinear increase in the energy-use efficiency, thus yielding more agricultural products per unit of energy input. This is better seen in comparing the total energy input per unit volume of corn production for Mexico in 1978. Although the average corn yield on Mexico's irrigated land is some 340 percent greater than on subsistence land, these higher yields represent only about 40 percent of the average corn yield in the entire United States for the same period.

Three-stage program

The FEF-AMEF study proposes that the development of scientific agriculture in Mexico occur in three stages. The first stage, from 1981 to 1985, will consist of the rapid application of scientific methods on the existing fertile cropland, concentrating on quickly increasing national production of food crops including wheat, beans and corn.

The second stage, from 1985 to 2000, will consist of consolidating the use of technology-intensive methods on all farms, while initiating the intensive use of corn, sorghum and soybeans as livestock feed, and *modestly increasing* the land under cultivation through irrigation.

The third stage, from 2000 to 2020, will consist of *rapidly expanding* the amount of irrigated land along the arid coastlines, using the river systems of the northeast and northwest. (For more details on the FEF-AMEF water resources plan, see box and map.)

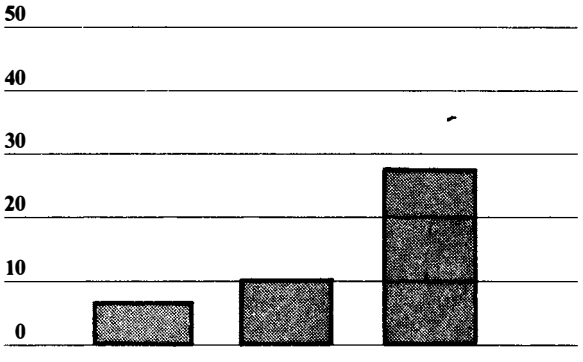
A key role in the overall program will be played by specially "selected areas"—relatively small areas where the most advanced agricultural methods will be applied. Instead of spreading a few basic agricultural techniques throughout a peasant population that would tend to resist their application, the "selected area" method will overcome this resistance to modern methods by demonstrating their success. The idea is to steadily decrease the total area cultivated by labor-intensive methods, substituting larger, more efficient mechanized units—including livestock-breeding ranches where soil and climate prohibit rainfed crops.

During the period between 1981 and 2005, a large percentage of the population which are currently migrant workers or subsistence farmers, could be quickly assimilated into agriculture-related industries, such as fertilizer production, construction or other rapidly expanding productive industries demanded by the overall Mexican development plan.

Simultaneously, the total area under cultivation will increase by 45 percent by the year 2020 (see Figure 4). By that year, crop yields in Mexico will, under fully capitalized conditions, exceed present average U.S. yields. Mexico's present average corn yield would be considered a crop failure in the U.S. However, yields from wheat hybrids specifically developed in Mexico are twice that of the U.S. average, but require an extremely high rate of fertilizer and pesticide use to sustain such yields. Given this fact, farm mechanization is a priority, both for improving total production in the near term and for retraining large numbers of field

FIGURE 3

Millions of BTU's per ton of corn produced

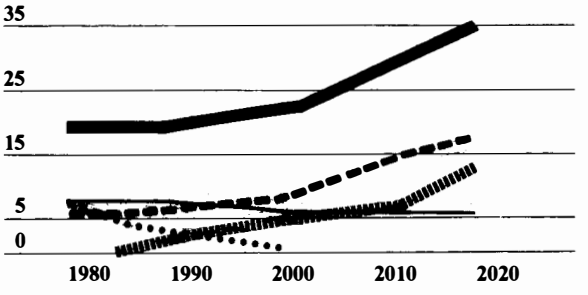


The above chart shows energy efficiency for the three modes of Mexican agriculture. The smaller bar corresponds to capital intensive agriculture, which consumes less energy per ton produced. The largest bar corresponds to so-called "traditional" agriculture, which consumes three times more energy per ton produced than moden agriculture. The middle bar corresponds to efficient rainfed.

FIGURE 4

Increase in land area under cultivation

(Millions of hectares)



Key

Total cultivated area ▬▬

Irrigated area ▬ ▬ ▬

Partially irrigated area ▮▮▮▮▮▮▮▮

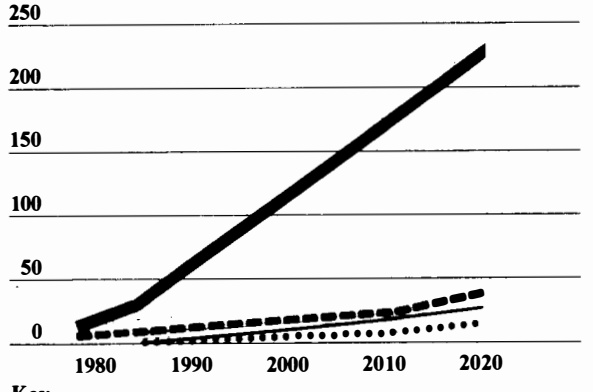
Rainfed (efficient) ———

Rainfed (subsistence) • • • • • •

FIGURE 5

Production of basic grains

(Millions of metric tons)



Key

Corn and sorghum ▬▬

Wheat and rice ▬ ▬ ▬

Soybean———

Beans • • • • • •

workers for more productive jobs. The objective is to reproduce the present U.S. level of machine-intensity on all basic cropland by 1990.

The total installed machine horsepower per unit of harvested area in Mexico is presently about 0.7 Hp/Ha, compared to about 2.67 Hp/Ha in the United States. Mexico presently has a production capacity of some 13,400 tractors per year, manufactured by both Mexican companies and subsidiaries of U.S.-based firms. At present, it operates about 130,000 tractors, representing some 0.43 Hp/Ha of the 12.9 million hectares of combined efficient rainfed and irrigated cropland. By 1990, it will require some 540,000 tractors, 180,000 harvesters, 360,000 farm trucks, and 900,000 tillage machines—approximately a four-fold increase in 10 years.

Similarly, the total machine power-density per unit of harvested area will be increased to 2.65 Hp/Ha by 1990 and continue to increase to about 3.15 Hp/Ha by 2020.

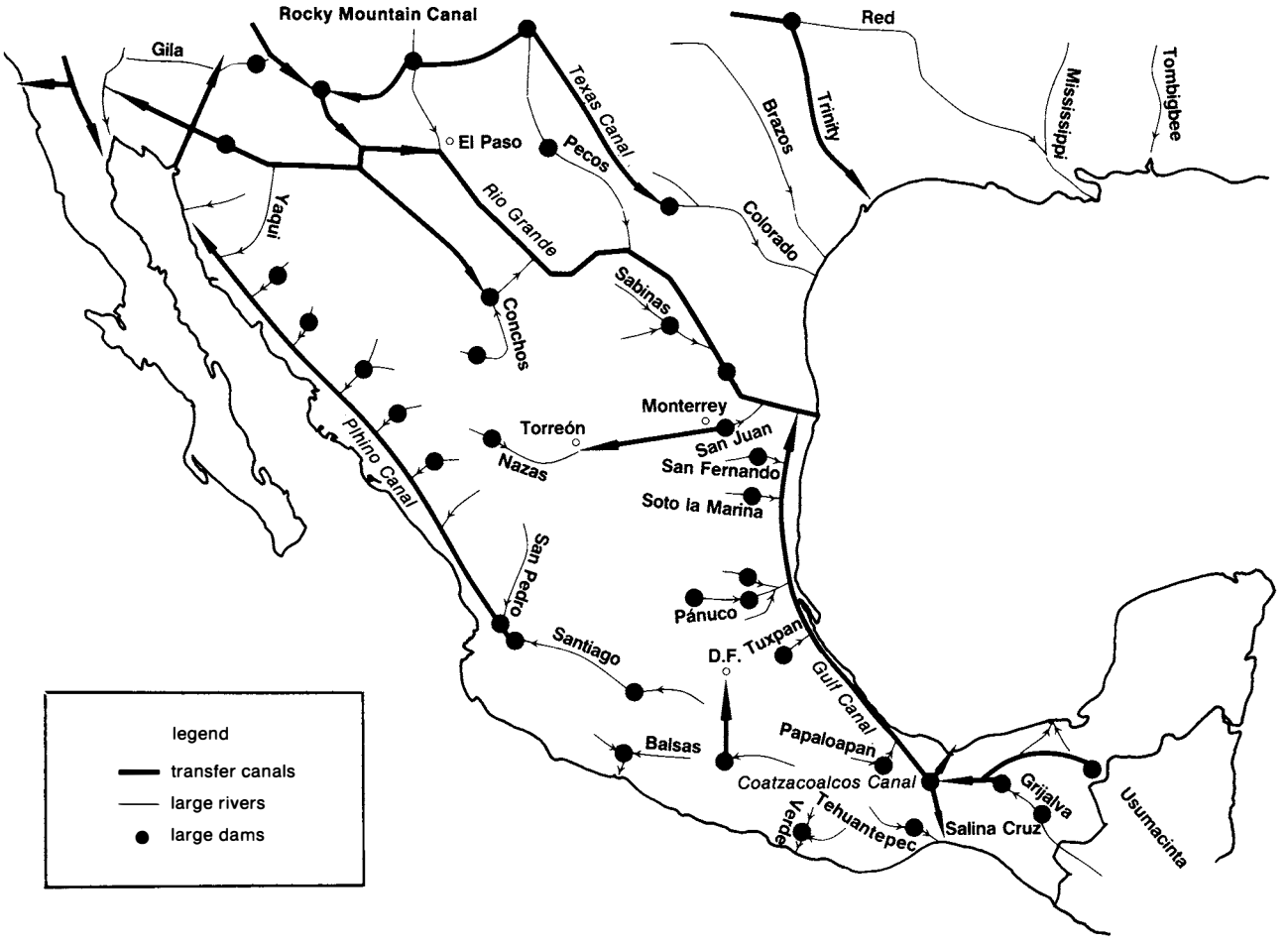
Mexico is well-endowed with the raw materials and energy resources for rapidly producing the necessary fertilizers and pesticides to rapidly build highly fertile soils in both existing and new cultivated areas. Total annual fertilizer use is expected to grow from 1.6 million metric tons in 1981 to 3.2 in 1985, to 3.6 in 1990, 6.8 in 2000 and 12.6 in 2020. The U.S. presently uses about 20 million metric tons per year.

The Mexican government fertilizer program announced last month requires the state company, Fertilizantes Mexicanos (FERTIMEX), to meet the national demand and maintain a healthy export level. Crop and livestock production in Mexico, as projected by this program, will dramatically increase (see Figure 5). The majority of feed crops produced (corn, sorghum, and soybeans) will be successively reinvested in increasingly more intensive livestock production.

The total meat, dairy and cereal requirements of the projected population of Mexico are shown using current U.S. per capita consumption as a reference for the average dietary requirements of a growing industrial nation. On this basis, cereal production under the FEFAMEF program exceeds population requirements by 1985, dairy production meets requirements by 1990, and meat production exceeds requirements before the year 2000.

This agricultural program will result in a net surplus *for export* of cereal grains and meat products within the first 10 to 20 years of implementation. But Mexico must concentrate on improving the breeding stock and growing conditions of cattle, hogs, and poultry, requiring the phased liquidation of inferior animals and replacement with carefully selected imported breeding stock of superior animals.

New National Hydraulic Plan 1980-2020



The water resources for Mexico, as developed by the Fusion Energy Foundation and the AMEF, will increase the irrigated land of Mexico five-fold and nearly double total cropland by the year 2020. The plan utilizes the existing official National Water Resources Plan published by the government in 1976 as a basis, and augments this plan with two major modifications that link the water supplies of the continent into a single unified grid.

This grid is established by transferring water from the south coastal areas of Mexico, where 80 percent of the nation's surface runoff is concentrated, to the north coastal areas of the country that have extremely dry but potentially fertile soils. The connecting link in the grid is established by delivering water from Alaska and Canada through the United States by way of the Rocky Mountain canal of the North American Water and Power Alliance. These water supplies will be distributed through canals and natural river systems, using gravity flow from the North, and pump-lift methods from the coastal canals, to reach productive inland areas of successively higher elevations by constructing a series of "water-staircase" dams. These elevated waterways will provide major networks of navigable streams, by which inland agricultural and industrial development will transport the bulk commodities of production input and output.

Most of the water will be collected in major reservoirs in the prolific rivers of the southeastern rainforest and transferred north by a major coastal canal that intersects similarly developed reservoir systems on the major rivers.

Source: Fusion Energy Foundation

Controversy over the SAM

It is impossible to modernize the world's diet according to the U.S. model 'because that would imply an oil and electrical energy consumption so large that the earth's resources wouldn't be sufficient. We must revert to peasant food modes to solve our food problems. . . . In the future only 2 percent of the world population will make use of the U.S. model.

—Cassio Luiselli, presidential agriculture adviser, to the daily Uno Mas Uno, *July 24, 1980*

This attack by the Mexican president's main agricultural adviser, Cassio Luiselli, on López Portillo's stated commitment to an "American System" farming model, is probably the most explicit encapsulation of the intense, and often publicly aired, factional struggle in the Mexican government over agricultural policy. The struggle has been fought mainly around the government's recently announced Mexican Food System (known by its Spanish acronym SAM) elaborated by a group of advisers under the direction of Luiselli.

Luiselli, an agronomist tied to World Bank agriculture projects in Mexico, together with official followers of that institution's Malthusian policies, clearly got the upper hand in determining the basic methodology of the program. The SAM's goals are achieving self-sufficiency in such Mexican basic foods as corn and beans by 1982, and in rice, wheat, soya, sorghum, sesame seed and safflower by the year 1985. Although these goals are commendable, the World Bank's "appropriate technologies" approach adopted by the authors makes their achievement questionable. But even if these goals were achieved, the application of the program guarantees food shortages on a long-term basis.

The flaws in the SAM

The program provides for an increase of public investment in the agriculture sector of 22 percent in the period 1980-82 and 25 percent in 1982. The problem is that following the World Bank recommendations, the SAM proposes to allocate those investments in one of the least productive Mexican modes of agriculture, subsistence agriculture in rainfed areas (whose inefficient energy throughput is overwhelmingly proved in the FEF-AMEF Mexican Agriculture Program). From this standpoint, the authors of the SAM totally overlooked the fact that competent agriculture planning for Mexico starts with a waterway project to bring water from the humid south to the better soils of the dry north coastal areas. What the SAM proposes is to disperse small investments here and there among millions of impoverished peasants throughout the whole country. In this way, the Mexican officials hope to defuse the potential social explosion of a hungry peasantry.

Taking advantage of this very real problem of Mexico, a product of long years of poor crop performances, Luiselli's "World Bank faction" managed to make the development of "appropriate technologies" an explicit goal of the SAM: "to orient and promote a technological development more appropriate to the production practices [giving] special attention to the rainfed areas, . . ."

The SAM's second major flaw is the lack of emphasis on the production of sorghum and other products for feed. This deemphasis is also a demand of World Bank officials, who recommend the production of only those crops that can alleviate hunger on a short-term basis. Enriched feed, which in turn will become vital animal protein in the form of milk, meat or eggs, is seen as not "appropriate" to the impoverished peasant diet. The long-term consequences of this decision will be disastrous for the development of a qualified industrial labor force.

The role of dirigism

Despite the World Bank input, the SAM is giving the Mexican government for the first time in history the opportunity to take control over agriculture policy decisions, from production to distribution. The program emphasizes key dirigist measures such as government-guaranteed prices for basic agricultural products and measures against land and commercial speculation.

This move could not be postponed given the pernicious role intermediaries and food speculators have traditionally played in the Mexican economy. That the government is determined to finally solve this problem was clearly seen in a meeting called this week by the president where all the state governors, cabinet members and directors of relevant state sector companies discussed coordination of the SAM implementation.

Besides giving preeminence to the government's dirigist role in the agriculture sector, the SAM sets some goals that can only strengthen the hand of a group of officials represented by the president himself and the director of Petroleos Mexicanos, Jorge Díaz Serrano, who have publicly argued in favor of a capital-intensive mode of production.