



UNIVERSIDAD AUTONOMA
DE NUEVO LEON



FACULTAD DE ECONOMIA

enfoque

VOL. IV NUMERO 1 SEGUNDA EPOCA

ENERO 1982

FACULTAD DE ECONOMÍA

Fundada en 1957

* La revista ENSAYOS, publica manuscritos de todos los campos de la economía, la estadística, las ciencias sociales y la educación. Se edita tres veces al año en los meses de Enero, Mayo y Septiembre; salvo cambios de última hora que determinen lo contrario.

Enero 1982

* La suscripción a la revista tiene un costo anual de \$350.00 (Trescientos cincuenta pesos, 00/100 MN) para todo el territorio nacional; y de 15.00 Dólares para el extranjero. Las solicitudes deben dirigirse a la propia Facultad, mediante cheque u orden de pago. Dirección: Facultad de Economía, Universidad Autónoma de Nuevo León, Loma Redonda #1515 Pte., Col. Loma Larga, Monterrey, N.L. México. Apdo. Postal 288.

DIRECTORIO

Consejeros:

Consuelo Meyer L.
Manuel Silos Martínez
Eladio Sáenz Quiroga
Romeo Madrigal H.
Edgar López Garza

* Toda comunicación relativa a manuscritos y correspondencia editorial, deberán ser dirigidos a: Lic. Andrés Garza García. Editor. Departamento de Relaciones, Facultad de Economía, U.A.N.L., Loma Redonda #1515 Pte., Col. Loma Larga. Monterrey, N.L. México. Apdo. Postal 288.

Director:

Arturo García Espinosa

* Las opiniones, juicios o ideas que puedan contener los artículos impresos en esta revista no reflejan de ninguna forma el criterio de la Facultad de Economía de la UANL, siendo de exclusiva responsabilidad de su autor. Sin embargo, esta Institución se reserva todos los derechos y la revista no puede ser reproducida sin permiso por escrito del Editor. Se autoriza la reproducción parcial para efectos de análisis o comentarios en otras publicaciones.

Editor:

Andrés Garza García

* Publicación realizada por el Departamento de Relaciones de la Facultad de Economía, de la Universidad Autónoma de Nuevo León.

I N D I C E

Pág.

AN ANALYSIS OF MEXICAN AGRICULTURAL
PRICE POLICIES. 1

Andrew Burst & Eduardo Segarra

DEMOGRAPHIC AND ECONOMIC CORRELATES
OF DEVELOPMENT AS MEASURED BY ENERGY
CONSUMPTION. 55

John V. D. Saunders and George R. Reinhart

LOS INFORMES PRESIDENCIALES EN MEXICO. 67

Francisco Valdés Treviño

PLANIFICACION DE LOS RECURSOS HUMANOS. 75

Lucinda Díaz de la Garza

AN ANALYSIS OF MEXICAN AGRICULTURAL PRICE POLICIES *

Andrew Burst & Eduardo Segarra

* Este trabajo fue presentado en Octubre de 1981 por Eduardo Segarra, pasante enviado por nuestra Facultad de Economía, y Andrew Burst, alumno de Economía Agrícola de la Universidad de Missouri-Columbia Institución con quien tenemos celebrado Convenio de Colaboración Académica.

I. Introduction

Throughout the 1970's and into this decade, Mexico has experienced rapid growth in domestic consumption of agricultural products. Part of the increase can be attributed to a rapid rate of growth in population, estimated to be greater than 3 percent per year in the 1970's. Another reason for this expanding demand is increasing incomes. As Mexico has continued to develop its manufacturing capabilities, as well as its recently reappraised petroleum potential, incomes of a large segment of the population have increased directly or indirectly. Agricultural production, especially of grains and oilseeds, has shown aggregate increases in the 1970's. However, output has continually lagged behind more rapid increases in consumption. The end result has been a continuing domestic agricultural production shortfall and a growing dependence on imported agricultural products.

During a period of 30 years, from the mid 1930's to the mid 1960's, the agricultural sector established the basis for the development of the entire Mexican economy. The agricultural sector, although declining in relative importance, continues to be of central concern to Mexican policy makers. Attempts to stimulate agricultural production and therefore reduce imports, have become increasingly important in the formulation of government agricultural policy. During the period 1963-72, the guaranteed prices (producer support prices) of all important grains and oilseeds were frozen. In 1972, the Mexican government began to increase these guaranteed price levels. These increases continue up to the present time.

Also, rising consumer prices are considered as politically undesirable as is Mexico's continued reliance on external food sources. Consequently, the Mexican government has also attempted to keep consumer food prices low. These policies have resulted in significant interventions into agricultural product markets.

These are some of the basic issues that are addressed in this paper. Discussion begins with a brief background of the agricultural sector as well as a description of the development of the government's marketing policy and institutions. The functions and objectives of CONASUPO, the government's price and marketing agency, are discussed. Also discussed are some of the consequences of government intervention into the agricultural product markets. Finally, an analysis and evaluation of Mexican price policy and the effects on the agricultural sector is made.

Due to the broad objectives and complex nature of Mexican agricultural policy, more specifically price policy, a comprehensive study is beyond the scope of this paper. This paper focuses attention on some major food and feed crops, notably: corn, edible beans, sorghum, soybeans, rice, wheat and safflower. Also, agricultural price policy at the production level is the primary focus of the discussion and analysis.

II. Background

For years Mexico has suffered many of the chronic development problems encountered by LDC's. Throughout the years, the Mexican government has attempted to find a suitable balance between the generally conflicting goals of expanding agricultural production and exports, and increasing the general economic welfare of the low-income population. Mexico's nearly dualistic agricultural sector has developed as a result.

The Mexican Revolution, which began in 1910, occurred as a partial result of the unequal distribution of land and the poor working conditions of the low-income rural peasant (campesino). Under the Constitution and through the Agrarian Law of 1917, attempts were made to reorganize the structure of agricultural landholdings. The larger agricultural enterprises, latifundios, were

expropriated and the land reorganized into cooperative or communal ejidos. Although redistribution of land began in 1917, maximum government intervention came under Lazaro Cardenas' administration (1934-40). During the period 1930-40, the ejidatarios share of total land area increased from 6.3 percent to 22.5 percent while their share of cropland increased from 13.4 to 47.4 percent⁽¹²⁾ (Table 2.1).

In 1940, with a change in administration, much less government emphasis was placed on the redistribution of land. During the period 1940-60, although the ejidatarios share of total land area increased slightly from 22.5 percent to 26.3 percent, their share of cropland actually decreased from 47.4 percent to 43.4 percent. Throughout this period, public investment policies stressed large scale irrigation projects, new land development, agricultural research and credit, and guaranteed prices for selected crops. Agricultural output soared as new land was brought under production and new plant varieties were introduced. The production of corn, the principal foodgrain increased from 1,640 thousand metric tons (TMT) in 1940, to 5,420 TMT in 1960. Production of beans, also an important basic food crop, increased from 97 TMT in 1940, to 528 TMT in 1960. Wheat production, which was a major emphasis of the Mexican Green Revolution, also increased dramatically from 464 TMT in 1940, to 2,203 TMT in 1964.*

Significant positive results have resulted from the Agrarian Reform. The restructuring of landholdings has brought about increases in employment for a large group of low-income rural peasants. During the period 1917 to 1970, approximately 2.7 million ejidatarios received land under the Agrarian Reform. Also, some improvements occurred in the distribution of incomes. The increasing share of agricultural output produced on the ejidos is a good indicator of this improvement in income distributions. The ejidatario's share of total agricultural production

* Source: Econotecnica Agricola

increased from 11 percent in 1930 to 41 percent in 1960.⁽¹⁷⁾ Since the Revolution, these welfare factors have continued to be politically, as well as socially sensitive issues in Mexico.

The Agrarian Reform has, however, brought about some undesirable side effects. Attempts to increase employment and improve income distributions have not necessarily gone hand in hand with increases in productivity and overall agricultural output growth. The restricted size of many of the ejidatarios landholdings has resulted in a relative inefficient subsector, with many farmers living at, or near, subsistence levels (Table 2.2). This has led to a scarcity of capital, which is fundamental for the acquisition of productivity increasing inputs.

During the term of President Lopez Mateos, 1958-64, greater emphasis was placed on achieving self-sufficiency in foodstuffs and on becoming a net exporter of corn, wheat and other agricultural commodities.⁽¹¹⁾ Agricultural production was stimulated through the use of relatively high guaranteed prices, and surpluses were exported through the Mexican Export and Import Company (Compania Exportadora e Importadora Mexicana - CEIMSA). Also, since food prices were considered too high, the Mexican government expanded its network of retail stores which sold basic commodities at low prices. During the mid 1960's, government policies seem to have been effective and Mexico began to export sizable quantities of corn and wheat.

With the beginning of the Echeverria administration in 1970, welfare issues such as a more equitable distribution of incomes again received more public attention. After 1970, production objectives were still considered vital, but much of the government investment in the agricultural sector was concentrated in the social areas--health, sanitation and education. To achieve these objectives, and to stimulate agricultural output and the adoption of new technologies, agricultural policies were directed toward maintenance of high agricultural product prices,

TABLE 2.1
MEXICO: AREA
BY TYPE OF OWNERSHIP, 1930-70

Census Year	Area (1000's of hectares)			
	Total	Ejidos	Colonos	Private
1930	131,594	8,345	6,000	117,250
1940	128,749	28,923	6,069	93,757
1950	145,517	38,894	7,554	99,069
1960	169,084	44,497	8,735	115,852
1970	139,868	60,533	9,191	70,144

PERCENTAGE DISTRIBUTION				
1930	100.0	6.3	4.6	89.1
1940	100.0	22.5	4.7	72.8
1950	100.0	26.7	5.2	68.1
1960	100.0	26.3	5.2	68.5
1970	100.0	43.3	6.6	50.1

Source: Government of Mexico Census Data.

TABLE 2.2
MEXICO: SIZE OF HOLDINGS BY TOTAL AND AREA PERCENTAGES, 1970

size	% of total parcels	% of total area
0-1 ha.	22.8	1.9
1-5 ha.	42.8	17.2
5-10 ha.	22.4	22.9
10-20 ha.	8.5	17.9
20-100 ha.	2.9	19.0
100 ha. and over	0.6	21.0

Source: Government of Mexico Census Data.

subsidization of inputs, particularly credit for low-income producers, but also fertilizer, improved seed and machinery, and the development of roads and rural infrastructure. Price supports for agricultural commodities that had remained constant since their implementation in 1963, began to increase dramatically in 1972 (Table 4.1). Continuing attempts were made to increase agricultural commodity prices both through raising price supports as well as through purchases of domestic production by the National Company of Subsistence Commodities (CONASUPO).

Throughout the 1970's, the growth rate of agricultural output declined partially because of poor weather, but also as a direct or indirect result of past and present government agricultural policy. Mexico, which had enjoyed a surplus position in the production of basic food grains such as corn, wheat and sorghum, throughout most of the 1960's was forced to import vast quantities of these commodities in the 1970's. Total cropland which stood at 14.4 million hectares in 1965, increased only 13.9%, to 16.4 million hectares in 1978. Agricultural output growth which had been 9.2 percent in 1946-55, and 5.3 percent in 1956-65, slowed to 2.5 percent in 1966-75.⁽¹⁸⁾ This declining growth in output and only minimal increases in cropland area, combined with a population growth rate in excess of 3 percent, put great strains on the Mexican economy (Table 2.3).

Mexican government economic growth strategy and political philosophy for the 1980's are embodied in the Global Development Plan (PGD) published in April 1980.⁽¹¹⁾ The PGD coordinates objectives and policies in thirteen different sectoral areas including the Mexican Food Supply System (Sistema Alimentario Mexicano, SAM). Under this plan, an anticipated earnings of Mex \$933 billion (U.S. \$40 billion) from the exports of oil and natural gas through 1982, would be distributed to the different sectoral areas. The agricultural sector would be the recipient of 25 percent of these revenues which would be earmarked for crops, livestock and rural development. In 1980, the total cost of these programs, SAM,

TABLE 2.3

MEXICAN POPULATION AND ECONOMIC INDICATORS, 1960-79

Year	Population	Rate of Growth of Deflated GDP	Agricultural Sector's Participation in GDP	Rate of Growth of Agriculture	Rate of Growth of Consumption
1960	34,923	7.0 1/	9.7	6.2 1/	6.2 1/
1970	50,695	6.9 2/	7.1	1.2 2/	7.0 2/
1971	52,450	2.4	7.0	1.8	5.4
1972	54,270	7.7	6.4	-2.6	7.6
1973	56,160	8.8	6.0	2.1	7.5
1974	58,120	7.7	5.9	3.2	0.8
1975	59,826	3.6	5.6	-0.7	9.1
1976	61,801	0.6	5.5	-0.3	-0.3
1977	63,822	1.4	5.7	6.5	2.9
1978	65,844	8.6*/	5.5	4.0	4.7
1979	67,899		4.9	-3.0	7.7
1,000 Persons		Percent	Percent	Percent	Percent

*/ Preliminary

1/ For 1960-65

2/ For 1965-70

SOURCE: Secretaria de Programacion y Presupuesto,
Plan Global de Desarrollo, 1980-1982, Anexos.
Mexico, D.F., April 1980.

were estimated at MEX \$50 billion (U.S. \$2.2 billion) for producer programs and MEX \$35 billion (U.S. \$1.5 billion) for the consumption side.⁽¹¹⁾

In recent surveys, it was estimated that approximately 35 million people, or over one-half the Mexican population did not obtain the 2,750 calories and the 80 grams of protein recommended by the Food and Agriculture Organization as the minimum daily requirement. Of this larger group, 19 million people--13 million in rural and 6 million in urban areas--were considered as seriously malnourished.⁽¹¹⁾ The diet of a large segment of the Mexican population, but especially the lower income consumers, is composed principally of corn and edible beans. Corn and beans, however, not only constitute an important position in the Mexican diet, but their cultivation also occupies the majority of the present cropland area. Corn and bean production accounted for 45.9 and 8.9 percent of total crop land area respectively in 1976. Moreover, a large part of this cropland area is located in traditional, small, lower income agricultural zones, especially in the central highlands.

The goals of SAM are to reach self-sufficiency in beans and corn by 1982, and in all "basic" food grains by 1985. It is planned that in the long run these expected food gains will come mainly from rainfed areas in the present agricultural zones and through large expansions of agricultural land in the tropical gulf coast zones.*

One of the major tools for achieving proposed short run agricultural production increases is Mexico's current producer price support policy. SAM involves 12 different program areas in the agricultural sector. In addition to

*Estimated "underexploited" land includes 3.6 million hectares in the Gulf and southeast zones, 200,000 hectares in the north, 500,000 in the center and 1.5 million hectares in the northern and central Pacific.⁽⁴⁾

support prices, these programs cover input subsidies, credit and crop insurance, producer organizations, food and commodity marketing processes, land tenancy and colonization.

The overall success of SAM depends heavily on the success of Mexican price policy. Price supports and input subsidies on "basic" foods could have favorable results on the production of these commodities, but will undoubtedly cause distortions in other "non-basic" foods and non-food agricultural commodities.

III. Agricultural Price Policy and Marketing Institutions

A. Historical Development

Since the early part of this century, the Mexican government has pursued a policy of intervening in the pricing and marketing of agricultural commodities. Article 27 of the Constitution of 1917 provided the government with the first legal basis for the regulation of product prices. Over the ensuing years, the Mexican government has utilized two principal approaches to the regulation of prices.⁽¹²⁾ The first was to influence the supply and distribution of particular commodities by establishing minimum producer prices. The second was to regulate consumer prices for those agricultural products considered as basic necessities.

In 1937, an active price support policy, as well as the regulation of supply and distribution, was initiated for wheat, through the founding of the Committee to Regulate the Wheat Market. Its major purpose was to regulate the Mexican wheat price and to insure the necessary supplies for national consumption. This agency was followed, shortly thereafter, by the creation of the Mexican Import and Export Company S.A. (CEIMSA). CEIMSA's responsibility was to export and import agricultural products with the objective of maintaining stable agricultural prices by obtaining sufficient supplies for the national market.

In 1938, the Committee to Regulate the Market for Subsistence

Commodities assumed the responsibilities of the Committee to Regulate the Wheat Market and also expanded coverage to other commodities. Its goals were more domestically oriented than CEIMSA in that they were centered on correcting the inefficiencies and irregularities in the production, distribution and pricing of the articles of basic consumption. The realization of these goals included the regulation of domestic buying, selling and storage. To complement the Committee to Regulate the Market for Subsistence Commodities the Consultative Committees of the Articles of Primary Consumption and the Committees of Vigilance of the Commerce of Articles of Primary Necessity were created at the end of 1940 and the beginning of 1941.

In 1941, the National Distributor and Regulator S.A. (NADYRSA) was established, replacing the previously created Committee to Regulate the Market for Subsistence Commodities. Among NADYRSA's functions were regulation of the prices of products of primary necessity or primary materials used in the production of these primary products. In 1949, NADYRSA was dissolved and its functions incorporated into CEIMSA.

In 1950, Congress passed the law titled, Powers of the President in Economic Matters (Atribuciones del Ejecutivo en Materia Economica), which broadened the government's price regulation policy from not only primary necessities but also to general foodstuffs. It also allowed the President to set prices by decree. The Bureau of Prices (Direccion General de Precios), under the Secretaria de Economia (later renamed the Secretaria de Industria y Comercio) was created in 1951 to implement the law.

The National Company of Subsistence Commodities S.A. (CONASUPOSA) was created in March 1961. CONASUPOSA's principal functions were to regulate the national markets of subsistence agricultural commodities. These functions included the enactment of policies to insure minimum prices to agricultural

producers, and also to put their products within price levels accessible to low-income consumers. On April 1, 1965, CONASUPOSA was officially replaced by CONASUPO.

B. CONASUPO

Agricultural prices in Mexico are largely administered by CONASUPO, a semiautonomous price and marketing agency of the federal government.* CONASUPO has several social and economic objectives including: (1) the promotion of increased purchasing power among low-income consumers and small farm producers, (2) the promotion of greater efficiency in the marketing system, and (3) the stimulation of agricultural output.⁽⁸⁾

The functions of CONASUPO are carried out by nine different interrelated agencies.⁽¹⁾ Among these agencies are:

1. CONASUPO Distributors S.A., DICONSA
2. CONASUPO Warehouse of Deposit S.A., ANDSA
3. CONASUPO Rural Warehouse S.A., BORUCONSA
4. CONASUPO Centers of Peasant Training S.A., CECONCA
5. CONASUPO Promoter of Social Improvement, PROMOTORA
6. CONASUPO Industries S.A., ICONSA
7. CONASUPO Industrialization of Milk S.A., LICONSA
8. CONASUPO Industrialization of Corn S.A., MICONSA
9. CONASUPO Industrialization of Wheat S.A., TRICONSA

The following is a brief description of the various agencies and their functions.

1. CONASUPO Distributors S.A., DICONSA is formed by six different regional offices located in the principal commercialized centers of Mexico. The

* Dependency of the Secretariat of Commerce.

delegations are located in: Guadalajara, Jal., the Federal District, Hermosillo, Son., Monterrey, N.L., Puebla, Pueb., and Villahermosa, Tab. Their principal objectives are:

1. Provide producers a fair price for their production.
2. Establish a marketing system which attempts to minimize the marketing margin for agricultural products.
3. Permit consumers access to agricultural products at low prices.

DICONSA contains a system of more than 1,700 grocery stores located in both the rural and urban sectors.

2. The National Warehouse of Deposit S.A., ANDSA was integrated into CONASUPO in 1974. The principal functions of ANDSA are:

1. Establishment of warehouses in the principal demographic areas, in order to maintain adequate stocks of agricultural products such as corn, edible beans, rice, etc.
2. Assist in the allocation of capital resources to increase production and merchandizing.

ANDSA operates in more than 250 locations throughout Mexico and manages 800 warehouses with an approximate capacity of 3.3 million metric tons. ANDSA is also promoting the installation of freezers throughout the Mexican coasts with the objective of accelerating the development of the fishing industry. Given their complementary activities, ANDSA functions within a coordinated system with BORUCONSA.

3. CONASUPO Rural Warehouse S.A., BORUCONSA was integrated into CONASUPO in 1971. The principal functions of BORUCONSA are:

1. Organize and promote the development of peasant production.

2. Provide leadership to the peasants and also inform them of the CONASUPO guaranteed price.

3. Provide facilities for the transporting of peasant production.

In 1977, BORUCONSA had 1,400 warehouses throughout Mexico with a capacity of 1.5 million MT. The number of warehouses had increased 50 percent since BORUCONSA was created in 1971. Other services that are provided by BORUCONSA are the facilities to thresh grain and also the selling of fertilizer to the peasant population. In 1977, BORUCONSA sold some 160,557 tons of fertilizer, about 15 percent of national consumption.⁽³⁾

4. CONASUPO Centers of Peasant Education S.C., CECONCA was integrated into CONASUPO in 1972. This agency has the objective of assisting peasants in different activities such as production processes, application of fertilizers, water management, conservation and management of grains and seeds, and breeding of livestock

CECONCA has two types of educational programs. The first consists of bringing peasants to CECONCA centers to demonstrate techniques on the promotion of rural development. In the other type of program, CECONCA provides on site extension to the peasants. In 1977, 71,671 peasants were enrolled in these programs.

5. CONASUPO Promoter of Social Improvement, PROMOTORA was created in 1966 with the principal objective of influencing the integration of the peasant into new potential areas of production. This involves providing technical assistance in new production systems, social assistance as well as the necessary infrastructure. The activities and programs of this agency are financed by the Secretariat of Commerce, the National Bank of Rural Credit, the Secretariat of Agriculture and Water Resources and others.

6. CONASUPO Industries S.A., ICONSA was created in 1975 with the following objectives:

1. Contribute to the economic development of the country through the processing of agricultural products such as vegetable oil, corn flour, wheat flour, feed grains, etc.
2. Preserve and distribute these products for domestic consumption and for exportation.
3. Development of more diversified products for low-income consumers.

ICONSA consists of several producer plants and five regional sales agencies. The production plants are located in Tultitlan, Estado de Mexico, Mexicali, B.C., Obregon, Son., Navojoa, Son., Nuevo Laredo, Tamps., Gomez Palacio, Dgo., and Monterrey, N.L.

The ICONSA regional agencies are located in Mexico, D.F., Monterrey, N.L., Guadalajara, Jal., Obregon, Son., and Gomez Palacio, Dgo. ICONSA cooperates with CONASUPO in the assembly of raw materials for the various production processes.

7. CONASUPO Industrialization of Milk S.A., LICONSA was created in 1972. LICONSA's principal objective is to regulate and modernize the milk products market, as well as increase both production and consumption by low-income families.

LICONSA operates with two production plants, one in Tlanepantla, Edo. de Mexico, and the other in Jiquilpan, Mich. These plants produce approximately one million liters of processed milk per day. LICONSA also has about 800 distribution points (retail stores) in Mexico City and also provides associations and hospitals managed by the government.

8. CONASUPO Industrialization of Corn S.A., MICONSA was integrated into CONASUPO in 1972. MICONSA's objective is to regulate and modernize the production of products derived from corn, an essential part of the diet of a large segment of the Mexican population. MICONSA is closely related to DICONSA which provides the raw materials to produce the various corn products.

MICONSA consists of five plants located in Tlanepantla, Mex., Arriaga, Chiap., Jaltipan., Vera. Guadalajara., Jal., and Los Mochis, Sin., which combined have a processing capacity of 300,000 tons of corn per year.

9. CONASUPO Industrialization of Wheat S.A., TRICONSA was integrated into CONASUPO in 1972. TRICONSA's objective is to provide different wheat products to low-income consumers at low prices. This agency operates principally in Mexico City since practically all its production is consumed by Mexico City's population.

C. Marketing Channels

The intervention of CONASUPO and other government agencies in the marketing of agricultural commodities is sizable. For guaranteed prices to be effective, the Mexican government, through CONASUPO, must intervene and purchase parts of the domestic agricultural production. This intervention requires government investment in collection, storage and distribution facilities. In years of shortage, the amount of domestic production purchased by CONASUPO is minimal. However, in these years, Mexico must import agricultural commodities to maintain sufficient supplies for national consumption. In good production years, purchases of crops, which are supported by CONASUPO, guaranteed prices may be extensive (Tables A.1-A.7). Also, to stimulate domestic production, numerous input subsidies have also been established to insure a sufficient and low cost supply

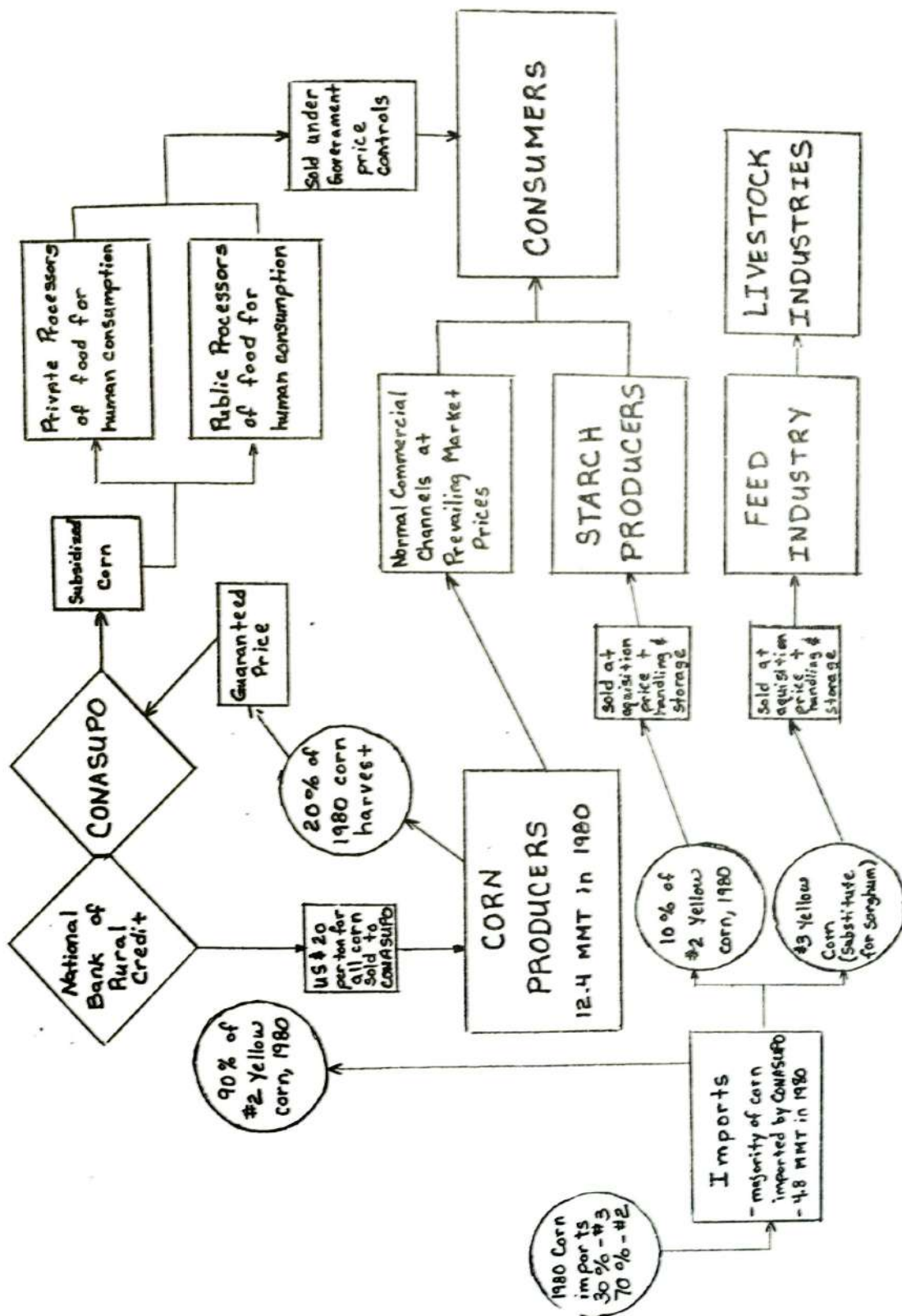
of inputs to the producer. Furthermore, the Mexican government, through CONASUPO and other agencies, has become involved in the processing of feed and food crops. This involvement has come through direct public intervention, as well as through subsidization of private companies. Mexican government funded companies operate in such industries as corn, wheat and milk processing, the feed industry and etc. Furthermore, the government controls various agricultural product prices at the wholesale and retail level. Finally, intervention has come through the formation of government operated retail stores. These stores help to ensure the Mexican consumer food at a reasonable price.

One example of Mexican government intervention is the domestic corn market (Figure 3.1). Corn producers can either sell their corn through private market channels at the prevailing market prices or they can sell to CONASUPO at the guaranteed price. In 1980, approximately 20 percent of the domestic corn harvest was sold to CONASUPO at the guaranteed price, MEX\$4450 (US\$193) per MT. Corn producers that sold their corn to CONASUPO in 1980, also received US\$20 per ton from the National Bank of Rural Credit. The average gross producer return for the 1980 corn crop was estimated at US\$222 per MT.⁽⁷⁾

CONASUPO then supplies subsidized corn to private and public corn processors, involved in the processing of food for human consumption. The average cost to these corn processors for the 1980 corn crop was estimated at US\$215 per MT.⁽⁷⁾ The difference between the producer returns and the processor's cost is absorbed by CONASUPO. In addition, corn processors pay no transportation costs to transport the corn from CONASUPO facilities to the processing plants.

The majority of agricultural commodity imports are made by CONASUPO. In 1980, corn imports consisted of significant quantities of #2 and #3 yellow corn. Ninety percent of the #2 yellow corn imported in 1980, was destined for human consumption and was distributed by CONASUPO at the same subsidized prices as

FIGURE 3.1 CORN MARKET FLOW CHART



domestically produced corn. The remaining 10 percent of the #2 yellow corn imports was sold to starch manufacturers at the cost of acquisition (import price) plus handling and storage. The #3 yellow corn, which is considered as a substitute for sorghum, is sold to the mixed feed industry at acquisition cost plus handling and storage.

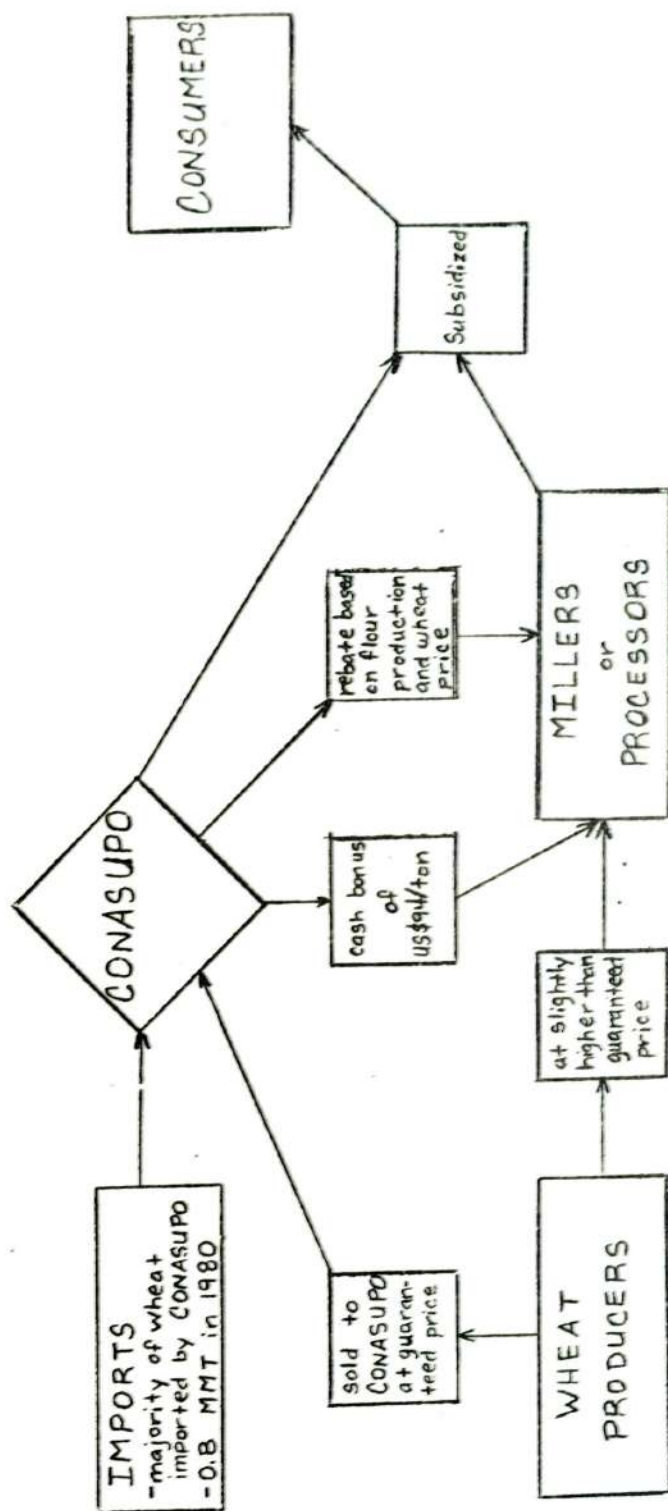
The marketing system for wheat is similar to that for corn (Figure 3.2). In 1980, wheat producers either sold their wheat to CONASUPO at the guaranteed price, US\$154 per MT, or on the open market at prevailing prices. Wheat millers then obtained their wheat requirements at the prevailing market price, but were given a cash rebate based on their flour production and the wheat purchase price. Furthermore, in 1980, millers received an additional cash bonus of approximately US\$94 per ton of wheat milled.⁽⁷⁾

In 1980, the total cost of subsidizing the consumption of 3.3 MMT of wheat was estimated at about US\$300 million. The total cost of subsidizing the non-feed utilization of approximately 11.5 MMT of corn was estimated to be US\$350 million.⁽⁷⁾ Total costs to the government for intervening in the wheat and corn markets were almost equal, because consumer subsidies on wheat food items were estimated to be more than three times greater per ton of grain equivalent than for corn. Also, imported wheat prices were higher than internal Mexican support prices, whereas corn was less expensive on the world market.

D. Establishment of Guaranteed Price Levels

The objective of the Board of Directors of Agricultural Economics, as well as other government agencies (i.e., CONASUPO), is the development of the agricultural sector. Guaranteed prices are established for numerous agricultural commodities with the objective of increasing production and profitability of agricultural activities.

FIGURE 3.2 WHEAT MARKET FLOW CHART



The determination of guaranteed prices is based on the probable number of hectares that will be planted in a designated year or season. Some statistical relations are estimated between the number of hectares planted and variables such as: rural prices,* costs of production, utility of production per hectare (value of production minus cost of production), previous yields and etc.⁽¹⁵⁾ This procedure is done separately for each of the five production zones in Mexico: North Zone, Center Zone, North Pacific Zone, South Pacific Zone and the Gulf Zone.

When the hectares planted are determined, the Board of Directors of Agricultural Economics estimates the demand for these products at the national level. Having these data, with probable production of the various agricultural products, the guaranteed prices are established. Also, it is important to mention that, political as well as social considerations are also involved in the establishment of guaranteed prices.

These guaranteed prices are published after planting, but prior to harvest. This announcement of the support level prior to harvest, but after planting, has the advantage of allowing more accurate appraisal of the supply situation, particularly with respect to weather.⁽⁹⁾

* Rural prices are the prices that are paid to the producer (farmer) at his farm, for his production.

E. Mexican vs. World Prices

During 1970-1980, agricultural prices, especially of food and feed crops, soared on the world market. However, even though increases in Mexican agricultural support prices since 1972 have been far greater than increases in world prices, numerous Mexican food and feed crop guaranteed prices remain below world price levels.* In the 1970's, expanding domestic demand continually outstripped domestic food and feed crop production. In order to satisfy this increasing demand, CONASUPO** was forced to import, mainly from the United States, large quantities of various food and feed crops at prices significantly higher than internal support prices (Table 3.1). Grain imports of 7.8 million metric tons (MMT) and oilseed imports of 1.2 MMT in 1980, resulted in an extremely large cost for CONASUPO and the Mexican economy (Table 3.2). Mexican corn and soybean production, favored by a guaranteed price well above world price, was unable to keep pace with the domestic demand and as a result, Mexico imported 4.8 MMT of corn and 750,000 metric tons of soybeans in 1980. This situation is illustrated graphically in Figure 3.3.

Given that the world equilibrium price in the #2 yellow corn market (P_w) is below the Mexican guaranteed price of corn (P_g), there is a shortage in the domestic production of corn equal to $\overline{Q_0Q_1}$ which is imported by CONASUPO.

* Notable exceptions are prices of corn and soybeans.

** Mexico prefers to purchase foreign grains and oilseeds by government-to-government transactions. However, purchases are made on a public tender or through direct negotiations with foreign suppliers, in that order of preference. CONASUPO imports practically all grain and oilseeds needed for domestic consumption. However, in March 1980, provisions were made between the Undersecretariat for Regulation and Supply (of the Ministry of Commerce) and the private mixed feed, wheat milling and oilseed processing industries for direct import purchases by these private sectors. In December 1980, the United States and Mexico signed a bilateral grains agreement which provides for the importation by Mexico of between 4.7 and 6.2 million metric tons of grain from the United States.

TABLE 3.1
COMPARISON OF WORLD AND MEXICAN
PRICES OF SELECTED
AGRICULTURAL CROPS, 1978-81

	World ^{1/}			Mexico ^{2/}		
	1978/79	1979/80	1980/81 ^{3/}	1978/79 ^{4/}	1979/80 ^{5/}	1980/81 ^{6/}
	(U.S.\$ per MT)					
CORN	105.3	119.3	142.4	127.3	152.3	200.5
WHEAT	137.8	173.4	182.2	114.1	131.7	147.1
GRAIN SORGHUM	111.8	146.0	176.2	89.1	102.2	125.0
SOYBEANS	281.8	283.0	317.3	243.6	280.1	344.8

This table was prepared to demonstrate relative differences between world and Mexican prices. World prices will vary according to location of source, transportation costs, etc.

^{1/}World prices are June-May average prices.

CORN, U.S. No. 2 Yellow, F.O.B. Vessel Gulf Ports

WHEAT, U.S. No. 2 Hard Winter, Ordinary Protein, F.O.B. Vessel Gulf Ports

SORGHUM, GRAIN, U.S. No. 2 C.I.F. Rotterdam

SOYBEANS, U.S. No. 2 Yellow, F.O.B. Vessel Gulf Ports

^{2/}Mexican prices are guaranteed prices (CONASUPO) for marketing year.

^{3/}Based on June-February average price.

^{4/}Exchange rate US\$1 = MEX\$ 22.78

^{5/}Exchange rate US\$1 = MEX\$ 22.85

^{6/}Exchange rate US\$1 = MEX\$ 23.20

SOURCE: United States Department of Agriculture, Economics, Statistics and Cooperatives Service, "FATUS": Foreign Agricultural Trade of the United States. Various Issues, 1980 and 1981.

Mexican guaranteed prices compiled from Compania Nacional de Subsistencias Populares (CONASUPO).

Table 3.2
 Mexican Imports from U.S. of
 Selected Agricultural Products,
 1974-80

	Wheat and Wheat Flour	Rice	Corn	Sorghum	Soybeans	Non-Fat Milk	Sugar & Tropical Products
	(1,000's of Dollars)						
1974	181,613	33	194,158	55,278	81,587	328	11,182
1975	13,040	317	208,788	62,489	6,705	249	10,122
1976	296	460	82,593	1,068	57,166	332	14,182
1977	41,392	362	176,311	66,823	108,323	101	11,298
1978	88,816	227	159,949	69,544	178,796	7,906	14,653
1979	197,152	2,797	114,166	154,017	118,277	6,145	17,156
1980	123,464	20,455	677,894	318,558	259,411	17,194	160,152

Source: United States Department of Agriculture Foreign Agricultural Service, Mexico and its Agriculture: A Developing Market. U.S. Embassy, Mexico City, July 1981, p. 49.

FIGURE 3.3

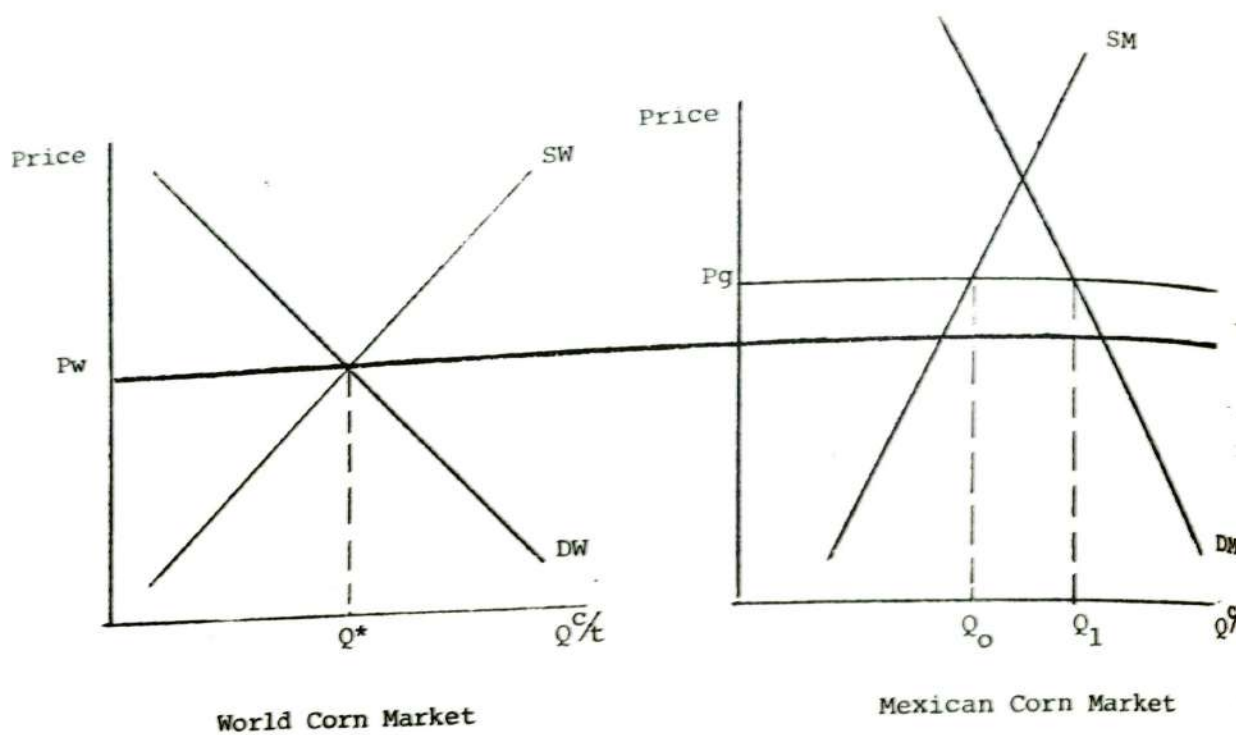
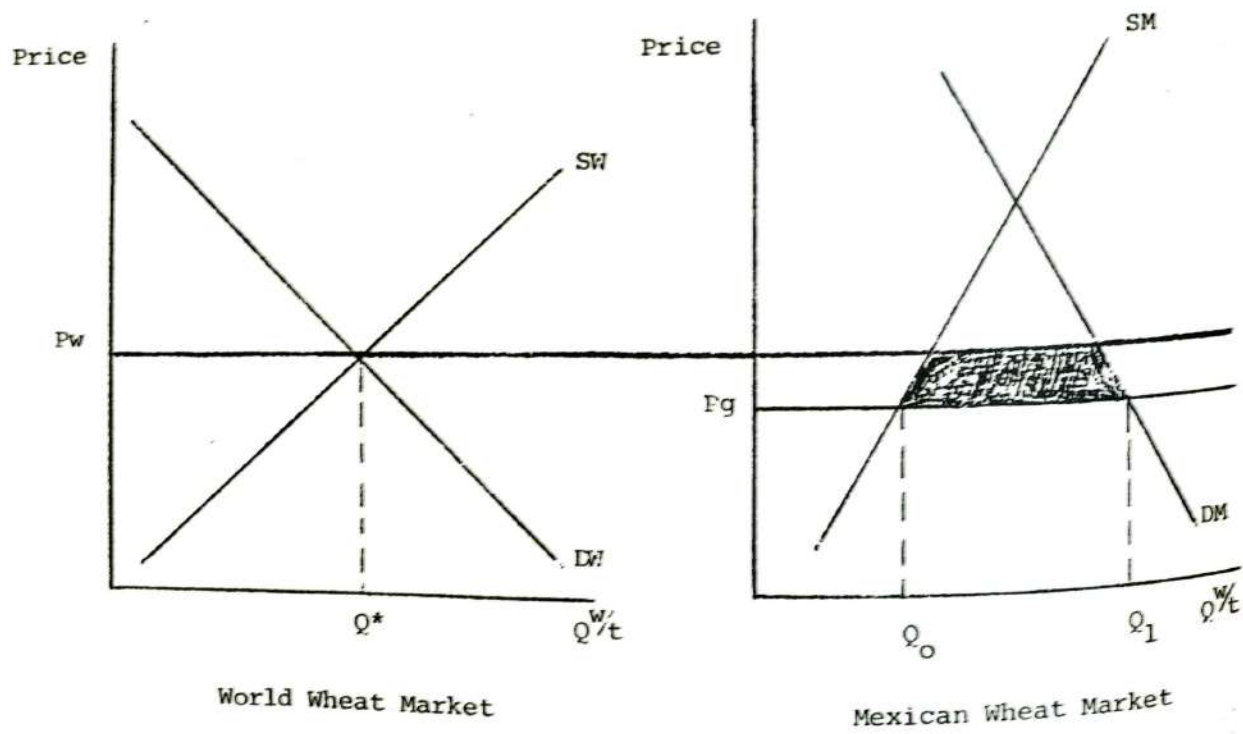


FIGURE 3.4



In 1980, more than 90 percent of this corn was destined for human consumption. These corn imports are then sold to the public and private corn food processors at a subsidized price.

Imports of other food and feed crops in 1980, included 2.1 MMT of grain sorghum and 800,000 metric tons of wheat. For these crops, the world prices are above the Mexican guaranteed prices. This situation is illustrated in Figure 3.4.

As can be seen, the world equilibrium price in the market of wheat (P_w), is above the Mexican guaranteed price of wheat (P_g). Given the supply and demand of wheat in Mexico, this results in an excess demand in the domestic wheat market. Therefore, the Mexican government imports the quantity $\overline{Q_0Q_1}$ of wheat to satisfy the domestic quantity demanded at (P_g). However, since the Mexican guaranteed price of wheat (P_g) is below the world price (P_w), the Mexican government must subsidize the imported wheat sold in the Mexican market. This subsidy is equal to the shaded area of Figure 3.4.

IV. Analysis and Evaluation of Mexican Price Policy and Its Effects on the Agricultural Sector

Mexican price policy concerning agricultural products is extremely broad based. At the producer, intermediate and consumer levels, numerous price supports, price ceilings and/or input subsidies have been established. Attempts to hold retail prices at a low level while rapidly increasing producer support prices has lead to substantial distortions in the agricultural product markets. To control retail prices, especially for basic food products, controlled retail and wholesale prices, as well as subsidies to intermediate producers (i.e., processors), have been expanded. However, the foundation of Mexican price policies is directed toward the agricultural producer, especially of basic food and feed crops.

During the period 1963-72, no increases occurred in the guaranteed

(support) prices of most food and feed crops. In 1972/73, in order to stimulate agricultural production to meet the growing domestic demand, and also because of a rapid inflation rate, the Mexican government, through CONASUPO, began to increase the level of food and feed crop guaranteed prices.

Between 1970 and 1979, the Prices Received by Farmers (PRF), for all agricultural products, increased 337 percent, whereas Consumer Prices (CPI) increased 266 percent. The comparison of CPI and PRF can be used to illustrate the relative measure of the changing terms of trade of agriculture (Table 4.1). Another measure of the relative terms of trade of agriculture are the implicit GDP deflators by sector. From 1970 to 1977, prices in the total economy (total GDP) increased a total of 192 percent (Table 4.2). However, the agricultural sector's increase in prices was 222 percent over the same period. Both these comparisons seem to suggest that in the 1970's, the agricultural sector was favored positively by Mexican price policy and that the terms of trade began to shift in favor of agriculture.

Even though the agricultural sector as an aggregate has been the recipient of a favorable price policy in recent years, within the sector complete parity is not the rule. Livestock prices, (again measured by the implicit GDP deflator), which are not supported at the producer level, have failed to keep pace with prices in the remainder of the agricultural sector (Table 4.2).^{*} Between 1970 and 1977, livestock prices rose 150 percent. In the same period, crop product prices, of which numerous are covered by price supports, rose 272 percent. Also, a lack of parity in the guaranteed prices is the rule among the various food and feed crops. Guaranteed prices of edible beans and corn, for example, increased 586 and

^{*} Egg and milk prices which are not controlled at the producer level, are controlled at the retail level.

TABLE 4.1

Indices of Prices Received by Farmers (PRF),
Prices Paid by Farmers (PPF)
and the Consumer Price Index (CPI),
1970-79

1970 = 100										
<u>PRF</u>	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
All agricultural products	100	102	105	135	163	195	267	317	363	437
Grains and pulses	100	101	102	127	183	217	238	300	350	-
Industrial crops	100	104	108	116	136	163	359	403	473	-
<u>PPF</u>										
Tractors and farm machinery	100	101	103	109	135	155	239	272	318	380
Fertilizer	100	98	99	101	131	124	164	193	220	252
Certified seeds	100	101	102	102	128	147	175	251	290	344
<u>CPI</u>	100	105	111	134	162	180	229	277	320	384

Source: PRF and PPF:
FAO Production Yearbook, 1979.

CPI: Plan Global de Desarrollo, 1980-82.

TABLE 4.2

INDICES OF THE IMPLICIT
GDP DEFLATOR BY
SECTOR, 1964-77
1970 = 100

	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977
Total GDP	84	87	90	92	96	100	105	110	124	154	180	220	292
Agriculture*	87	87	91	92	96	100	100	109	137	165	195	239	322
Crop Production	88	88	91	92	95	100	102	111	148	188	228	283	373
Livestock	86	88	92	90	98	100	98	105	118	126	140	177	250

*Includes the forestry and fisheries subsectors.

Source: World Bank, Special Study of the Mexican Economy:
Major Policy Issues and Prospects. Report No.
2307-ME, May 30, 1979.

373 percent respectively, between 1970 and 1980. Soybeans, sorghum, safflower and wheat support prices increased 400, 364, 300 and 289 percent respectively, during the same period (Table 4.3).

Although recent Mexican price policy goals are to expand agricultural production, little increases are apparent in basic food crops such as corn and edible beans. Guaranteed prices of corn, which were constant for the period 1963-72, increased more than 209 percent from MEX\$940 in 1972, to MEX\$2900 per MT in 1978. Total corn production increased only 10.8 percent during the period 1971-72 to 1977-78. Corn yields, however, seem to have reacted favorably. Corn yields which averaged 1268 kilograms per hectare per year in the period 1971-72, increased 13.5 percent to an average 1439 kilograms in 1977-78. During the same time period, however, total corn harvested area declined from an annual average 7,491 to 7,330 thousand hectares. The edible bean situation was similar. During the period 1972-78, guaranteed prices for beans increased 243 percent from MEX\$1750, to MEX\$6000 per MT. However, total bean production actually declined from an annual average 911 TMT in 1971-72, to 859 TMT in 1977-78. This decline in production was caused by a significant decrease in bean harvested area. During the period 1971-72 to 1977-78, average annual bean harvested area declined from 1,826 to 1,605 thousand hectares. However, during the same period annual edible bean yields increased 7.2 percent from an average 500 to an average 536 kilograms per hectare.

While basic food crops have shown little output response to increasing guaranteed prices, cash/commercial crop production appears to have reacted favorably.* Output of safflower, sorghum and soybeans all increased throughout the 1970's. These production increases, however, came about almost

* Domestic market prices and official guaranteed prices tend to be very closely correlated (except during extreme shortages) and therefore both play an integral part in producer decision making.

TABLE 4.3

Mexican Guaranteed Producer Price Indices
of Selected Agricultural
Crops, 1963-80 ¹
(pesos per MT)
1970 = 100.0

	CORN	EDIBLE ² BEANS	WHEAT	GRAIN SORGHUM	SAFFLOWER	COTTON ³	SOYBEAN	PADDY RICE
1963	100.0	100.0	100.0	100.0	100.0	-	100.0	95.5
1970	100.0	100.0	100.0	100.0	100.0	-	100.0	100.0
1971	100.0	100.0	100.0	100.0	100.0	-	100.0	100.0
1972	100.0	100.0	100.0	116.0	100.0	-	100.0	100.0
1973	127.7	131.4	100.0	152.0	106.7	-	168.7	100.0
1974	159.6	342.9	142.4	227.2	200.0	-	206.2	272.7
1975	202.1	285.7	191.7	256.0	213.3	-	218.7	227.3
1976	248.9	300.0	191.7	281.6	233.3 ⁴	-	218.7	272.7 ⁵
1977	308.5	300.0	224.5	324.8	266.7 ⁴	-	250.0	281.8 ⁵
1978	308.5	342.9	284.8	324.8	306.7	-	343.7	281.8 ⁵
1979	370.2	457.1	328.6	373.6	366.7	-	400.0	338.2
1980	473.4	685.7	388.8	464.0	400.0	-	500.0	404.5

¹ for marketing year

² preferred

³ no guaranteed price

⁴ for irrigated area - 213.3 and 260.0 for 1976 and 1977 respectively.

⁵ for Sinaloa rice, 250.0

Source: (See Appendix, Tables A.1-A.8)

entirely through dramatic expansions in cropland area. The increases in harvested area averaged 276, 155 and 225 percent for safflower, sorghum and soybeans respectively, during the period 1968-71 to 1978-79. However, while production and area for these three crops were up substantially, average yields of the oilseeds--safflower and soybeans--declined during the same period, while sorghum yields recorded only a slight increase. Wheat was an exception to these basic trends with production and yields up slightly, while harvested area registered a slight decline.

A partial explanation for this disparity in output response, between cash and basic food crops, could be the large increases in price supports for sorghum, safflower and soybeans during the period 1972-78. However, output of edible beans, which received even more favorable guaranteed prices, did not increase as dramatically as the cash crops and actually decreased during the 1972-78 period. Another more plausible explanation, is that the price supports had a more dynamic output (more specifically area) response in cash crops than in basic food crops (Table 4.4 and 4.5). This seems to suggest that the supply elasticity for these crops is elastic. Basic food crops; corn and beans, staples in the Mexican diet, and which are grown to a large degree by small, low-income traditional producers, on non-irrigated land, seem to have had little supply response to price (i.e., inelastic supply). However, cash crops which are generally grown on more commercialized, large, irrigated farming enterprises, seem to have been responsive to price changes (Table 4.6 and 4.7). This supply response coupled with a growing demand for livestock feed--a large user of sorghum, safflower and soybeans--may explain in part the increases in sorghum, safflower and soybean output (Table 4.8 and 4.9).

This may partially explain the disparity between basic and cash crop output, but why did yields decrease and area increase for cash crops while basic crop yields and area reacted in the opposite direction? Part of the explanation may come

TABLE 4.4
HARVESTED AREA
OF SELECTED AGRICULTURAL
CROPS, 1960-79

YEAR(S)	CORN	EDIBLE BEANS	WHEAT	GRAIN SORGHUM	SOYBEANS	SAFFLOWER	COTTON	RICE
(1000's of hectares)								
60-63	6295	1581	810	137	17	32	831	139
64-67	7769	2094	796	460	45	89	744	147
68-71	7477	1789	783	892	134	167	521	148
72-75	7077	1715	719	1223	294	237	438	184
76	6783	1315	894	1251	172	184	234	159
77	7469	1630	708	1413	314	403	419	180
78	7191	1580	759	1397	216	429	349	121
79	6236	1229	n/a	1368	386	494	378	n/a

Sources: (See Appendix, Tables A.1-A.8)

TABLE 4.5
HARVESTED AREA INDICES, 1960-79
INDEX 1968-71 = 100

YEAR(S)	CORN	EDIBLE BEANS	WHEAT	GRAIN SORGHUM	SOYBEANS	SAFFLOWER	COTTON	RICE
60-63	84.2	88.3	103.4	15.3	12.6	19.1	159.5	93.9
64-67	103.9	117.04	101.6	51.5	33.5	53.2	142.8	99.3
68-71	100	100	100	100	100	100	100	100
72-75	94.65	95.8	91.8	137.1	219.4	141.9	84.06	124.3
76	90.7	73.5	114.1	140.2	128.3	110.1	44.9	107.4
77	99.8	91.1	90.4	158.4	234.3	241.3	80.4	121.6
78	96.1	88.3	96.9	156.6	161.1	256.8	66.9	81.7
79	83.4	68.6	n/a	153.3	288.0	295.8	72.5	n/a

Sources: (See Appendix, Tables A.1-A.8)

TABLE 4.6
YIELD OF SELECTED AGRICULTURAL
CROPS, 1960-79

YEAR(S)	CORN	EDIBLE BEANS	WHEAT	GRAIN SORGHUM	SOYBEANS	SAFFLOWER	COTTON	RICE
(kilograms/hectare)								
1960-63	987	408	1779	2210	1835	1269	584	2232
64-67	1135	448	2554	2943	1924	1399	726	2431
68-71	1207	449	2849	2717	1932	1457	822	2548
72-75	1206	566	3274	2749	1737	1439	878	2803
76	1182	562	3761	3219	1754	1299	953	2907
77	1357	472	3464	3060	1642	1284	997	3143
78	1520	600	3666	2999	1543	1435	1047	3307
79	1295	666	3618	2680	1816	1341	n/a	3238

Sources: (See Appendix, Tables A.1-A.8)

TABLE 4.7
YIELD INDICES, 1960-79
1968-71 = 100

YEAR(S)	CORN	EDIBLE BEANS	WHEAT	GRAIN SORGHUM	SOYBEANS	SAFFLOWER	COTTON	RICE
1960-63	81.7	90.8	62.4	81.3	94.9	87.0	71.0	87.5
64-67	94.0	99.7	89.6	108.3	99.5	96.0	88.3	95.4
68-71	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
72-75	99.9	126.0	114.9	101.1	89.9	98.7	106.8	110.0
76	97.9	125.1	132.0	118.4	90.7	89.1	115.9	114.0
77	112.4	105.1	121.5	112.6	84.9	88.1	121.2	123.3
78	125.9	133.6	128.6	110.3	79.8	98.5	127.3	129.7
79	107.3	148.3	127.0	98.6	94.0	92.0	n/a	127.1

Sources: (See Appendix, Tables A.1-A.8)

TABLE 4.8
PRODUCTION
OF SELECTED AGRICULTURAL
CROPS, 1960-79

YEAR(S)	CORN	EDIBLE BEANS	WHEAT	GRAIN SORGHUM	SOYBEANS	SAFFLOWER	COTTON	RICE
(1000's of metric tons)								
1960-63	6218	646	1438	296	35	42	485	312
1964-67	8816	936	2031	1088	86	128	540	361
1968-71	9034	893	2228	2463	258	253	430	379
1972-75	8532	969	2372	3377	513	343	382	516
76	8017	740	3363	4027	303	240	224	463
77	10137	770	2456	4325	516	518	418	567
78	10931	949	2785	4190	334	616	366	401
79*	9255	1056	2272	3902	701	665	n/a	489

Sources: (See Appendix, Tables A.1-A.8)

TABLE 4.9
PRODUCTION INDICES, 1960-79
INDEX 1968-71 = 100

YEAR(S)	CORN	EDIBLE BEANS	WHEAT	GRAIN SORGHUM	SOYBEANS	SAFFLOWER	COTTON	RICE
1960-63	68.9	72.3	64.5	12.0	13.6	16.6	112.8	82.3
1964-67	97.6	104.8	91.2	44.2	33.3	50.6	125.6	95.3
1968-71	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1972-75	94.4	108.5	106.5	137.1	198.8	135.6	88.8	136.1
76	88.7	82.9	150.9	163.5	117.4	94.9	52.1	122.2
77	112.2	86.2	110.2	175.6	200.0	204.7	97.2	149.6
78	121.0	106.3	125.0	170.1	129.5	243.5	85.1	105.8
79	102.4	118.3	102.0	158.4	271.7	262.8	n/a	129.0

Sources: (See Appendix, Tables A.1-A.8)

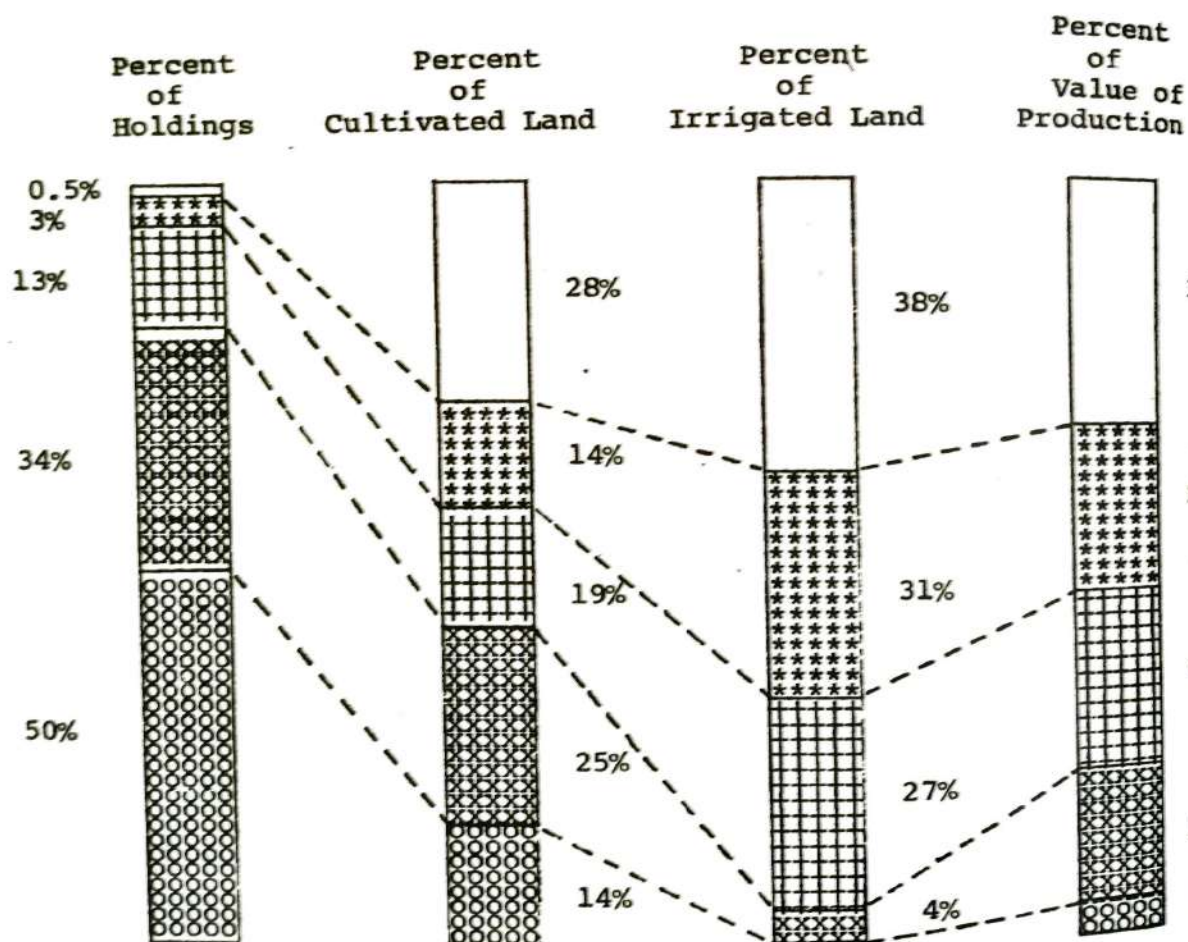
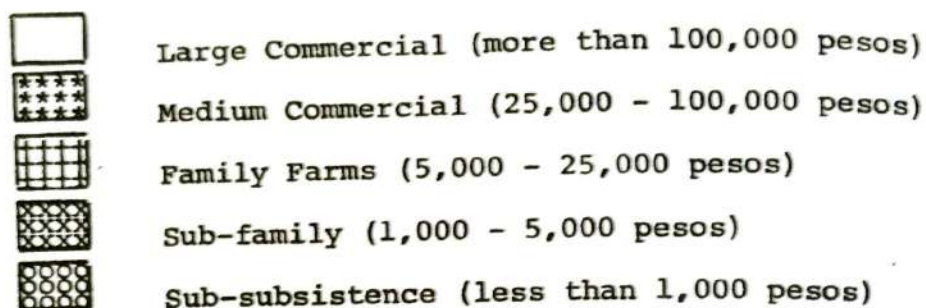
from the fact that irrigated area devoted to basic crop production increased in the 1970's (Table 4.10, 4.11 and 4.12).^{*} Between the periods 1971-72 and 1977-78, corn plantings on irrigated lands increased from 5.39 percent of total corn area to 6.92 percent. This expanding use of irrigated land for corn production was similar to that for edible beans and rice production. During the same period, irrigated edible bean area increased from 3.56 percent to 4.94 percent. With respect to rice, irrigated area increased from 40.48 percent to 51.59 percent. Therefore, since yields are significantly higher on irrigated land than on rainfed lands, part of the aggregate yield increases recorded by beans and corn can be attributed to these changing production patterns. Conversely, cash crop area under irrigation, as a percentage of total cash crop area, registered decreases. However, total cash crop area was up significantly in the 1970's, whereas basic food crop area declined. Consequently, decreasing aggregate yields for some cash crops could be partially explained by large increases in the usage of less productive, non-irrigated land for cash crop production.

Another possible explanation for the increasing yields of basic food crops and the decrease in some cash crop yields, could be a direct result of agricultural policy. Corn, and especially edible bean guaranteed price increases were for the most part greater than those for cash crops. Therefore, basic food crop producers possibly were beginning to receive sufficient incentives and the necessary inputs to increase production per area, whereas cash crop producers were finding it more profitable to simply increase land area, which was often less productive. Also, partly responsible for this disparity in yields could have been a greater amount of input subsidies; credit, fertilizer, seed, etc., to basic food producers.

^{*} Only irrigated land in Federal Irrigation Districts is accounted for in this discussion. Total irrigated land area would be higher.

TABLE 4.10

DISTRIBUTION OF CULTIVATED
AND IRRIGATED LAND AND VALUE
BY TYPE OF HOLDING, 1960



Source: Poleman, Thomas T., "Food, Population, and Employment: Some Implications for Mexico's Development". Cornell Agricultural Economics Staff Paper Number 78-19, Ithaca, N.Y., 1978.

TABLE 4.11

PERCENT OF THE TOTAL AREA OF SELECTED AGRICULTURAL PRODUCTS
UNDER IRRIGATION¹, 1971-78

YEAR	CORN	EDIBLE BEANS	WHEAT	GRAIN SORGHUM	SOYBEANS	SAFFLOWER	COTTON	RICE
1971	5.28	3.54	65.41	33.94	80.25	86.12	90.19	40.48
1972	5.51	3.58	65.37	33.36	80.91	81.32	77.02	42.37
1973	5.54	3.39	66.84	36.15	82.16	78.93	71.82	37.78
1974	6.53	7.35	58.92	32.72	78.80	81.87	77.98	42.39
1975	6.30	9.67	64.62	32.49	69.93	76.91	81.65	47.81
1976	6.60	7.54	72.23	40.84	58.62	96.42	75.94	36.65
1977	7.06	4.60	70.00	29.33	65.36	56.33	73.04	48.23
1978	6.79	5.29	68.01	29.48	59.42	74.27	80.82	51.59

^{1/} Due to the lack of information these figures include only irrigated area in the irrigation districts.

TABLE 4.12

IRRIGATION INDICES, 1971-78
1971 = 100

YEAR	CORN	EDIBLE BEANS	WHEAT	GRAIN SORGHUM	SOYBEANS	SAFFLOWER	COTTON	RICE
1971	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1972	104.3	101.1	99.9	98.2	100.8	94.4	85.3	104.6
1973	104.9	95.7	102.1	106.5	102.3	91.6	79.6	93.3
1974	123.6	207.6	90.0	96.4	98.1	95.0	86.4	104.7
1975	119.3	273.1	98.7	95.7	87.1	89.3	90.5	118.1
1976	125.0	212.9	110.4	120.3	73.0	111.9	84.2	90.5
1977	133.7	129.9	107.0	86.4	81.4	65.4	80.9	119.1
1978	128.5	149.4	103.9	86.8	74.0	86.2	89.6	127.4

Sources: Econotecnica Agricola Consumos Aparentes de Productos Agricolas 1925-78,
Vol. III, No. 9, Sept. 1979.
Informe Estadistico No. 98, Dec. 1979, Direccion General de Economia
Agricola.

8

As a direct or indirect result of Mexican agricultural price policy, dramatic changes in crop mixes have occurred. For example, the harvested area of cotton decreased by more than 50 percent from 1965 to 1978, whereas the harvested area of land competing crops such as soybeans and sorghum, increased 789 and 444 percent respectively, during the same period.* This suggests that various producers in the agricultural sector switched their lands to those competing crops which were more profitable.

Distortions resulting from the present price policy are especially apparent in Mexican sugar market. Mexico had historically been self-sufficient and a sugar exporter. However, partially due to poor weather and antiquated equipment, but also due to the established price policy, Mexico has now become an importer of sugar. By maintaining a policy of adequate quantities of sugar to the consumer at "reasonable" prices, the government artificially controlled sugar prices at levels substantially below the cost of production. In the past, this disparity was paid by revenues generated by sugar exports. Recently, however, as Mexico moved into a net importer position, the disparity resulted in a large government consumer subsidy for sugar. Estimates are that the sugar subsidy which cost eight billion pesos in 1979, increased to 25 billion pesos in 1980.⁽¹¹⁾ Therefore, in 1980 the Mexican government decided to let the sugar price rise and amidst public outcry increased the retail price more than 100 percent. However, Mexican imports of sugar will most likely continue, at least in the short run.**

Distortions in the production of eggs have also been created by the present agricultural price policy. The price of eggs, which is controlled at the retail and

* Cotton is produced for fiber as well as for oil and meal.

** Trade agreements with Cuba and the U.S. have been made for domestic sugar requirements.

wholesale levels, increased only 98 percent between 1972-78, however, the price of sorghum, the principal feedgrain used in egg production, increased 180 percent in the same period.* During the period, December 1977 through August 1978, the cost of production of one kilogram of eggs increased 6.2 percent from 15.43 to 16.39 pesos. However, during this same period, the producers profit decreased 94 percent from 1.02 to 0.06 pesos per kilogram.⁽¹³⁾ This resulted in numerous small and medium-sized egg producers leaving the market.

Distortions have also occurred in the Mexican milk market. The recent stagnation in pasteurized milk production was attributed to poor returns to producers due to the relatively low government controlled ceiling price of fluid pasteurized milk, and increased the sales of uncontrolled, lower quality, unpasteurized milk at a higher price.⁽¹¹⁾

Mexican price policy also involves the subsidization of agricultural inputs. Such inputs as fertilizer, certified seed and machinery were made available to producers at subsidized levels during the 1970's. Since 1970, the prices of inputs increased at a slower rate than have agricultural prices (Table 4.1). From 1970 to 1979, fertilizer prices increased about 145 percent while "all agricultural product" prices increased 336 percent. Also, federally subsidized irrigation projects continue to provide water to agricultural producers at a fraction of the true cost. Subsidies to cover operation and maintenance costs in large scale irrigation projects were estimated at MEX\$1.0 billion in 1977.⁽¹⁶⁾ This figure, however, does not account for the even more substantial capital costs.

Throughout the 1970's, even though Mexico pursued an apparent positive agricultural price policy, little output and a negative harvested area response

* Based on a Mexico City average annual retail price, SARH, *Econotecnica Agrícola*, "Mercado de Huevo." Volume II, Number 10, October 1979.

occurred in basic food crops such as corn and edible beans. However, the yields of these crops increased during the same period. Output of cash crops seems to have reacted favorably to price incentives. Most of these increases in output, however, were the result of increasing cash crop area (with the exception of wheat). Yields of most of the cash crops (again with the exception of wheat and also sorghum) tended to decrease throughout the 1970's.

What are the implications of Mexico's present agricultural price policy on other important agricultural industries? At present, Mexico enjoys a large surplus and balance of trade surplus in strawberries and tomatoes. The coffee industry is also a large earner of foreign exchange. Also, the livestock industry, especially poultry and pork, is showing signs of rapid expansion. However, if price supports continue to favor basic food crops without attention to these other important industries, further growth is not so clear.

V. Summary and Conclusions

The Mexican Government, throughout the recent development of its agricultural price policy, has been unable to sufficiently stimulate production of basic food crops to satisfy a constantly increasing domestic demand. Yields of corn and edible beans have shown recent increases, however, these increases have tended to be offset by decreases in harvested area. As a result, corn and edible bean production remained somewhat constant, amidst recent rapid increases in guaranteed producer prices. Given the differences in objectives involved in the Mexican agricultural price policy, the apparent result has been the stimulation of production of various cash crops such as safflower, sorghum and soybeans. These increases in cash crop production have come about almost exclusively as a result of significant increases in harvested area.

The end result of the stagnation in basic food crop production has been

sizeable increases in agricultural imports. Also, even though wheat, sorghum and soybean production increased during the period 1972-78, these increases still were unable to keep pace with a rapidly expanding domestic demand. As a result, imports of wheat and sorghum, as well as soybeans, also continued at record levels throughout the 1970's.

Over the last ten years, Mexico has had two different and constantly conflicting price policy goals. On the one hand the Mexican Government has attempted to provide higher income levels, especially for low-income agricultural producers, through increases in guaranteed prices. On the other hand, government agricultural policies have stressed providing basic foods at low prices to the consumer. These policies have tended to create distortions in the various agricultural product markets, as well as resulting in a great cost to the Mexican economy. From an economic point of view, the amounts and the levels of the numerous subsidies and price supports seem to be an extreme burden on the Mexican economy. However, given the government's overall social objectives, the role CONASUPO has played recently in the marketing of agricultural products appears to have been satisfactory.

Given that there was little or no response in harvested area of basic food crops to higher agricultural producer price levels, the Mexican Government initiated SAM in 1980. SAM's principal objectives are focused on increasing output of traditional food crops, of which they hope to achieve self-sufficiency by 1982. These increases in output are expected to come from increases in productivity of present farming areas as well as sizeable increases in the overall agricultural land area.

It would seem that this program is dependent upon the ability of the agricultural policy, not only to steer the crop mix, but also to gain sizeable increases in cropland area. Some changes in price policy have occurred since 1980.

However, the success or end result of this new program are not yet known. Numerous factors will weigh heavily on the outcome of SAM. Such factors as the rate of growth of population as well as the rate of growth and distribution of incomes will heavily influence potential future demand for food and feed crops. Also, the objectives of the next administration (1982) will undoubtedly influence the outcome of SAM. Furthermore, it is suggested that SAM will not be a short-run solution to current agricultural problems. The long-run solutions must involve these planned increases in total cropland as well as increases in the productivity of existing agricultural areas. Also, a certain degree of structural change will have to accompany these increases. However, hopefully, the program will yield sufficient benefits to account for the overall effort and amount of resources invested.

APPENDIX

TABLE A.1
CORN SUMMARY DATA, 1960-80

Year	Total Production 1000 MT	% Purchased by CONASUPO Percent	Harvested Area 1000 ha	Yield Kg/Cultivated Hectare	Guaranteed Price Pesos/MT	Average Rural Price Pesos/MT	Imports 1000 MT	Exports 1000 MT
1960	5419		5558	975	--	729	28.5	457.5
61	6246		6287	993	--	749	34.1	0.1
62	6337		6371	995	940	762	17.9	3.8
63	6870		6963	987	940	942	475.8	0.4
64	8454		7460	1133	940	945	46.5	282.8
1965	8936		7718	1158	940	959	12.0	1347.2
66	9271		8286	1119	940	918	4.5	851.9
67	8603		7610	1130	940	940	5.1	1254.0
68	9061		7675	1181	940	934	5.5	896.6
69	8410		7103	1184	940	894	6.4	789.1
1970	8879		7439	1194	940	905	761.8	2.6
71	9785	16.7	7691	1272	940	900	18.3	274.4
72	9222	9.2	7292	1265	940	902	204.2	425.9
73	8609	10.0	7606	1132	1200	1109	1145.2	31.6
74	7847	3.3	6717	1168	1500	1463	1282.1	1.6
1975	8448	11.1	6694	1262	1900	1863	2660.8	6.3
76	8017	17.2	6783	1182	2340	2167	913.8	4.2
77	10137	18.2	7469	1357	2900	2837	1985.6	1.4
78	10931		7191	1520	2900	2912	1344.4	1.7
79*	9255		7148	1295	3480			
1980					4450			

1/ Marketing Year

SOURCES: SARH, Econotecnica Agrícola: Consumos Aparentes de Productos Agrícolas, 1925-1978. Volume III, Number 9, September 1979.

*1979 Total Production, Harvested Area and Yield data from FAO Production Yearbook. 1979.

Guaranteed Prices and % purchased by CONASUPO from CONASUPO.

TABLE A.2

EDIBLE BEAN SUMMARY DATA, 1960-80

Year	Total Production 1000 MT	% Purchased by CONASUPO	Harvested Area 1000 ha	Yield Kg/Cultivated Hectare	Guaranteed ^{1/} Price Pesos/MT	Average Rural Price Pesos/MT	Imports 1000 MT	Exports 1000 MT
1960	528		1325	398	--	1342	24.9	0.2
61	723		1617	447	1750	1564	9.8	(0)
62	655		1673	392	1750	1647	3.3	2.4
63	677		1710	396	1750	1693	8.7	31.6
64	891		2091	426	1750	1726	8.2	20.1
1965	859		2116	406	1750	1744	0.5	16.5
66	1013		2240	452	1750	1790	0.6	102.1
67	980		1929	508	1750	1755	0.4	56.4
68	856		1790	479	1750	1758	0.3	79.8
69	834		1655	504	1750	1800	0.4	53.5
1970	925		1746	530	1750	1848	8.6	11.3
71	953	21.1	1965	485	1750	1976	0.5	0.2
72	869	3.2	1686	515	1750	2031	2.7	38.6
73	1008	11.0	1869	540	2300	2992	18.1	28.8
74	971	35.4	1551	626	6000	5602	39.5	0.7
1975	1027	33.2	1752	586	5000	5260	104.4	0.2
76	739	26.2	1315	562	5250	4699	0.2	42.2
77	770	15.7	1630	472	5250	5434	29.3	130.1
78	948		1580	600	6000	7500	1.2	44.1
79*	1056		1585	666	8000			
1980					12000			

^{1/} Marketing Year

(0) signifies less than 50 MT

Sources: SARI, Econotecnía Agrícola: Consumos Aparentes de Productos Agrícolas, 1925-1978. Volume III, Number 9, September 1979.*1979 Total Production, Harvested Area and Yield data from FAO Production Yearbook. 1979.

Guaranteed Prices and % purchased by CONASUPO from CONASUPO.

TABLE A.3
SOYBEAN SUMMARY DATA, 1960-80

Year	Total Production 1000 MT	% Purchased by CONASUPO	Harvested Area 1000 ha	Yield Kg/Cultivated Hectare	Guaranteed ^{1/} Price Pesos/MT	Average Rural Price Pesos/MT	Imports ^{2/} 1000 MT	Exports ^{3/} 1000 MT
1960	5		4.0	1230	--	1210	0.1	
61	20		9.9	1985	--	1272	0.4	
62	56		27.3	2076	--	1302	2.4	
63	56		27.4	2051	1600	1371	0.9	
64	60		30.6	1968	1600	1392	1.9	
1965	57		27.4	2107	1600	1409	2.9	
66	94		54.2	1749	1600	1427	5.0	
67	131		69.8	1875	1600	1601	5.3	
68	275		132.9	2069	1600	1599	12.1	
69	286		163.1	1757	1600	1599	15.6	
1970	214		111.7	1920	1600	1635	101.6	
71	255		128.9	1985	1600	1658	68.3	
72	376		221.6	1700	1600	1793	10.7	(0)
73	585		311.8	1877	2700	3030	42.4	(0)
74	491	16.5	300.1	1636	3300	3297	434.8	(0)
1975	598	23.0	344.4	1738	3500	3350	22.0	
76	302	0.1	172.3	1754	3500	4151	347.9	
77	516	0.3	314.2	1642	4000	5212	525.1	
78	334		216.4	1543	5500	5729	891.6	(0)
79*	701		386.0	1816	6400			
1980					8000			

^{1/} Marketing Year

(0) signifies less than 50 MT

^{2/} Trade figures don't account for oil or meal.

Sources: SARH, Econotecnica Agrícola: Consumos Aparentes de Productos Agrícolas, 1925-1978, Volume III, Number 9, September 1979.

*1979 Total Production, Harvested Area and Yield data from FAO Production Yearbook, 1979. Guaranteed Prices and % purchased by CONASUPO from CONASUPO.

TABLE A.4

WHEAT SUMMARY DATA, 1960-80

Year	Total Production 1000 MT	% Purchased by CONASUPO Percent	Harvested Area 1000 ha	Yield Kg/Cultivated Hectare	Guaranteed ^{1/} Price Pesos/MT	Average Rural Price Pesos/MT	Imports 1000 MT	Exports 1000 MT
1960	1189		840	1417	913	868	4.4	0.1
61	1401		836	1676	913	912	7.6	0.2
62	1455		747	1946	913	843	27.1	1.3
63	1702		819	2079	913	915	46.2	72.6
64	2203		818	2692	913	936	62.4	576.2
1965	2150		858	2505	913	944	12.5	684.9
66	1647		730	2254	913	882	1.1	47.8
67	2122		778	2724	913	849	1.2	279.1
68	2080		790	2632	913	857	1.6	3.0
69	2326		841	2765	913	849	0.8	252.9
1970	2676		886	3020	913	842	1.1	41.7
71	1830	34.5	614	2981	913	861	177.1	85.8
72	1809	35.5	686	2634	913	852	641.5	16.9
73	2090	44.1	640	3264	913	890	719.6	12.4
74	2788	26.1	774	3602	1300	1344	976.6	20.1
1975	2798	38.1	778	3596	1750	1792	88.5	45.1
76	3363	44.5	894	3761	1750	1739	5.3	21.0
77	2455	19.5	708	3464	2050	2127	456.4	25.5
78	2784		759	3666	2600	2601	458.5	21.5
79*	2272		628	3618	3000			
1980					3350			

^{1/} Marketing Year

(0) signifies less than 50 MT

Sources: SARH, Econotecnica Agrícola: Consumos Aparentes de Productos Agrícolas, 1925-1978. Volume III, Number 9, September 1973.

*1979 Total Production, Harvested area and Yield data from FAO Production Yearbook, 1979.

Guaranteed Prices and % purchased by CONASUPO from CONASUPO.

TABLE A.5
GRAIN SORGHUM SUMMARY DATA, 1960-80

Year	Total Production 1000 MT	% Purchased by CONASUPO Percent	Harvested Area 1000 ha	Yield Kg/Cultivated Hectare	Guaranteed/ Price Pesos/MT	Average Rural Price		Imports 1000 MT	Exports 1000 MT
						Pesos/MT	Pesos/MT		
1960	209		116	1797		636		9.5	0.1
61	390		116	2491	525	564		31.3	(0)
62	295		117	2516	550	558		58.7	(0)
63	402		197	2036	565	584		137.9	0.1
64	525		276	1901	560	601		21.4	0.4
1965	746		314	2376	625	632		33.9	--
66	1410		575	2450	625	639		22.9	34.9
67	1666		673	2475	625	620		4.5	392.7
68	2132		829	2570	625	622		60.6	166.1
69	2455		883	2781	625	639		11.7	43.3
1970	2747		920	2829	625	646		25.9	41.8
71	2515	0.3	935	2689	625	681		17.1	57.7
72	2611	1.0	1108	2355	725	736		246.3	0.2
73	3269	1.2	1184	2760	950	848		13.6	0.6
74	3499	3.8	1155	3028	1420	1268		426.7	0.3
1975	4125	12.1	1455	2855	1600	1574		835.1	0.2
76	4026	14.2	1251	3219	1760	1660		44.6	0.3
77	4324	17.7	1413	3060	2030	1998		714.5	(0)
78	4190		1397	2999	2030	2094		729.2	1.3
79*	3902		1456	2680	2335				
1980					2900				

1/ Marketing Year

(0) signifies less than 50 MT

Sources: SARH, *Econotecnica Agrícola*: Consumos Aparentes of Productos Agrícolas, 1925-1978. Volume III, Number 9, September 1979.

*1979 Total Production, Harvested Area and Yield data from *FAO Production Yearbook*. 1979.

Guaranteed Prices and % purchased by CONASUPO from CONASUPO.

SAFFLOWER SUMMARY DATA, 1960-80

Year	Total Production 1000 MT	% Purchased by CONASUPO	Harvested Area 1000 ha	Yield Kg/Cultivated Hectare	Guaranteed ^{1/} Price Pesos/MT	Average Rural Price Pesos/MT	Imports ^{2/}		Exports ^{3/}	
							1000 MT	1000 MT	1000 MT	1000 MT
1960	32		25	1248	--	1245				
61	41		32	1260	--	1315				
62	46		36	1270	--	1269				
63	47		36	1298	1500	1308			(0)	
64	47		35	1325	1500	1379			(0)	
1965	79		58	1354	1500	1369			(0)	
66	236		164	1432	1500	1390			50.6	
67	149		100	1486	1500	1460	(0)		21.9	
68	102		85	1191	1500	1478			(0)	
69	208		144	1443	1500	1504				
1970	288		175	1645	1500	1542				
71	410	10.3	264	1550	1500	1555			0.3	
72	271	36.6	198	1364	1500	1575			47.4	
73	298	--	197	1506	1600	1896			12.7	
74	272	--	191	1421	3000	3748				
1975	532	81.2	363	1466	3200 ^{2/}	3365			5.8	
76	240	1.7	184	1299	3300 ^{2/}	3650			0.1	
77	518	--	403	1284	4000 ^{2/}	4186	(0)		(0)	
78	615		429	1435	4600	5645	(0)		(0)	
79*	665		496	1341	5500					
1980					6000					

^{1/} Marketing Year

(0) signifies less than 50 MT

^{2/} For irrigated areas, 3200 pesos in 1976, and 3,900 pesos in 1977.

^{3/} Trade figures don't account for oil or meal.

Sources: SARN, *Econotecnia Agrícola*: Consumos Aparentes de Productos Agrícolas, 1925-1978. Volume III, Number 9, September 1979.

*1979 Total Production, Harvested Area and Yield data from *FAO Production Yearbook*, 1979.

Guaranteed Prices and % purchased by CONASUPO from CONASUPO.

TABLE A.7

FADDY RICE SUMMARY DATA, 1960-80

Year	Total Production 1000 MT	% Purchased by CONASUPO Percent	Harvested Area 1000 ha	Yield Kg/Cultivated Hectare	Guaranteed ^{1/} Price Pesos/MT	Average Rural Price Pesos/MT	Imports ^{2/}		Exports ^{3/}	
							1000 MT	1000 MT	1000 MT	1000 MT
1960	327		142	2297	850	891	22.3		2.7	
61	332		146	2275	900	928	0.2		3.0	
62	288		133	2158	900	1008	0.1		61.0	
63	296		134	2199	1050	1056	2.1		0.3	
64	274		132	2070	1100	1077	(0)		(0)	
1965	377		128	2734	1100	1137	17.8		(0)	
66	372		152	2439	1100	1125	11.5		(0)	
67	417		168	2482	1100	1098	(0)		(0)	
68	347		138	2503	1100	1145	9.1		45.7	
69	394		152	2582	1100	1187	4.8		(0)	
1970	405		149	2703	1100	1190	16.3		--	
71	369	4.6	153	2404	1100	1226	0.8		(0)	
72	403	0.7	156	2582	1100	1127	0.7		11.8	
73	450	3.3	150	2996	1100	1608	37.9		12.0	
74	491	12.7	172	2843	3000	2691	71.3		4.2	
1975	716	35.5	256	2792	2500	2816	(0)		(0)	
76	463	7.4	159	2907	3000	3025	(0)		0.3	
77	567	19.8	180	3143	3100 ^{3/}	3012	0.1		3.2	
78	401		121	3307	3100 ^{3/}	3539	0.1		59.6	
79*	489		151	3238	3720					
1980					4450					

^{1/} Marketing Year^{2/} Clean rice^{3/} For sinaloa rice, 2750 pesos.

(0) signifies less than 50 MT

Sources: SIAP, Econotecnía Agrícola:
Number 9, September 1979.*1979 Total Production, Harvested Area and Yield data from FAO Production Yearbook. 1979.
Guaranteed Prices and % purchased by CONASUPO from CONASUPO.

Consumos Aparentes de Productos Agrícolas, 1925-1978. Volume III.

TABLE A.8

COTTON SUMMARY DATA, 1960-80

Year	Total Production 1000 MT	% Purchased by CONASUPO Percent	Harvested Area 1000 ha	Yield Kg/Cultivated Hectare	Guaranteed ^{1/} Price Pesos/MT	Average Rural Price Pesos/MT	Imports ^{2/}		Exports ^{3/}	
							1000 MT		1000 MT	
1960	470		899	523		6056	1.0		324.3	
61	449		793	566		6434	1.0		315.8	
62	485		787	617		6272	1.1		433.7	
63	535		846	632		6310	1.6		379.1	
64	565		808	699		6363	1.8		327.2	
1965	577		813	710		6399	5.2		218.5	
66	521		695	750		6403	5.3		459.3	
67	494		662	747		6378	5.5		284.2	
68	591		705	834		6382	5.9		323.8	
69	397		513	774		6287	6.5		378.1	
1970	333		411	812		6579	7.0		222.7	
71	396		457	866		7541	7.4		173.0	
72	416		523	796		8358	6.4		222.4	
73	392		425	922		13929	8.9		217.9	
74	512		578	887		11267	8.4		203.9	
1975	205		226	907		12065	11.1		37.9	
76	223		234	953		27116	91.9		179.1	
77	418		419	997		27610	21.4		152.8	
78	366		349	1047		30435	0.7		199.6	
79										
1980										

^{1/} Cotton does not receive a guaranteed producer price.

Sources: SARH, Econotecnica Agrícola: Consumos Aparentes of Productos Agrícolas, 1925-1978. Volume III, Number 9, September 1979.

VII. Bibliography

- (1) Compania Nacional de Substancias Populares (CONASUPO), Que Es CONASUPO? Mexico, D.F., 1978.
- (2) Federal Reserve Bank of Dallas, "Voice": Mexico, A Growing Market for U.S. Farm Products. January 1981.
- (3) Food and Agriculture Organization, FAO Production Yearbook, Volume 33, Statistics Series No. 28, Rome, Italy, 1979.
- (4) Food and Agriculture Organization, "Ceres"; FAO Review on Agriculture and Development: Mexico's New Frontier: The Humid Tropics. September-October 1979.
- (5) Foreign Agricultural Service, "Foreign Agriculture": Mexico Joins Billion-Dollar Markets as U.S. Sales Rise 13 Percent Above 1978 Level. Volume XVII, Number 5, Washington, D.C., May 1980.
- (6) Ibid, "Foreign Agriculture": SAM Is Launched; Mexico Self-Sufficiency In Basic Foods, Reduced Imports. Volume XIX, Number 1, Washington, D.C., January 1981.
- (7) Ibid, "Grains." FG-21-81, Washington, D.C., May 26, 1981.
- (8) Looney, Robert E., Mexico's Economy: A Policy Analysis with Forecasts to 1990. Westview Press, Boulder, Colorado, 1978.
- (9) Mellor, John W., "The Basis for Agricultural Price Policy." A/D/C Teaching Forum, No. 22, November 1972.
- (10) Oficina de Asesores del C. Presidente, Sistema Alimentario Mexicano. Mexico, D.F., March 1980.
- (11) Office of the Counselor for Agricultural Affairs, Mexico and Its Agriculture: A Developing Market. U.S. Embassy, Mexico City, July 1981.

- (12) Ross, John B., The Economic System of Mexico. California Institute of International Studies, Stanford, California, 1971.
- (13) Secretaria de Agricultura y Recursos Hidraulicos, Econotecnia Agricola: Mercado del Huevo. Volume II, Number 10, Mexico, D.F., October 1978.
- (14) Ibid., Econotecnia Agricola: Consumos Aparentes de Productos Agricolas 1925-1978. Volume III, Number 9, Mexico, D.F., September 1979.
- (15) Secretaria de Agricultura y Recursos Hidraulicos, Subsecretaria de Agricultura y Operacion Direccion General de Economia Agricola, II Congreso Nacional Sobre Estadisticas Agropecuarias y Forestales: Precios de los Productos Agropecuarios y Forestales y Costos de Produccion. Mexico, D.F., November 1979.
- (16) Secretaria de Programacion y Presupuesto, Plan Global de Desarrollo, 1980-82. Mexico, 1980.
- (17) Sillas, Luis, Projection of the Mexican Supply of Selected Agricultural Products to 1985 and 1990: The Impact of the Oil Revenues. Unpublished M.S. Thesis, University of Missouri, May 1981.
- (18) World Bank, Special Study of the Mexican Economy: Major Policy Issues and Prospects. Report No. 2307-ME, May 30, 1979.

DEMOGRAPHIC AND ECONOMIC CORRELATES OF DEVELOPMENT
AS MEASURED BY ENERGY CONSUMPTION *

John V. D. Saunders and George R. Reinhart **

RESUMEN

El consumo de energía per cápita se relacionó, en 112 áreas del mundo, con una serie de variables económicas y demográficas. Se encontró asociaciones lineares para cuatro variables económicas, y una asociación curvilínea, con una curva en forma de J, para cuatro variables demográficas. Se encontró la distribución exponencial $y = e^{-x}$ para las curvas de las variables demográficas (tasa cruda de natalidad, tasa de mortalidad infantil, porcentaje de muertes debidas a enfermedades infecciosas y contagiosas, y expectativa de vida). Utilizando una tabla de funciones exponenciales uno puede determinar valores para la distribución de estas variables y la tasa cruda de mortalidad para cualquier nivel de consumo de energía que se desee.

SUMMARY

Per capita consumption of energy in 112 world areas was related to a series of economic and demographic variables. Linear associations were found for four economic variables, and a

* El presente trabajo, publicado por la Revista "Demography" (Vol. 4, No. 2, 1967), se reproduce con autorización expresa de Population Association of America.

** University of Florida.

*** El Dr. John V. D. Saunders es Profesor Fulbright colaborando actualmente en la Licenciatura en Estadística Social con especialidad en Demografía que se imparte en esta Institución.

curvilinear association in the form of a J curve for four demographic variables. It was found that the exponential distribution $y=e^{-x}$ for the curves for the demographic variables (crude birth rate, infant mortality rate, percent of deaths from contagious and infectious diseases, and life expectancy). By using a table of exponential functions, one can determine values for the distribution of these variables and the crude death rate for any desired level of energy consumption.

The basic assumption of this paper is that per capita consumption of energy represents the most satisfactory single index of both demographic and economic development presently available.

The development of societies has been accompanied step-by-step by the discovery of ever more efficient energy converters having increasingly large capacity, and by their widespread use. These converters, in turn, have made possible new and more complex forms of social organization. ^{1/}

Energy data in this paper are taken from the United Nations Statistical Yearbook (1965) where the data are stated in Kilograms of coal equivalent. Thus, a given number of units of energy consumed per capita refers to the number of Kilograms of coal equivalent consumed. Included in the computations, in addition to the population base, are consumption of coal, lignite, petroleum products, natural gas, and hydro- and nuclear electricity.

^{1/} See Fred Cottrell, Energy and Society (New York: McGraw-Hill, 1955).

Thus, low-order energy conversion, such as that of plants, animals, sails, windmills, water wheels, and man himself, are excluded.

Although these statistics share with all others a degree of imperfectibility, there is reason to believe that they are considerably more accurate in their reflection of states of development than per capita income, which has commonly been used for this purpose. Perhaps per capita consumption of energy for nonindustrial purposes could give a better index of social development, but unfortunately, that index is not available.

First, the accounting procedures for compiling the basic consumption statistics for the various sources of energy are relatively simple. Production statistics and exports and imports of the various sources of energy are easily obtained from relatively few sources. Second, conversion to a uniform measure can be accomplished by uniform conversion factors. Relatively little estimation is necessary to determine the basic amounts.

Per capita income statistics, by contrast, encounter considerably greater problems, with regard to both compilation and conversion to a standard unit of value. National accounting procedures, particularly in underdeveloped countries, are often rather arbitrary and heavily reliant on estimates. Per capita income within the same country does not provide a uniform measure of acquisitive power for different periods, although acquisitive power may be substantially affected by changes in prices. Thus, for example, the fact that national and per capita income in the United States was approximately halved during the years, 1929-34 does not mean that real per capita income was halved, for prices dropped. When the conversion of figures for several nations into a standard unit, usually the dollar, is made, the difficulties

are multiplied and compounded. Assuming stable currencies and ignoring the aggravating factor of varying degrees of inflation in the economies of different countries, it is only possible to know, within very broad limits indeed, the equivalency of per capita income figures for widely diverse areas of the world.^{2/}

PROCEDURES

All areas of the world with populations of one million or more as listed in the United Nations Demographic Yearbook (1964) are included. Energy consumption figures were taken from the United Nations Statistical Yearbook. Economic and demographic data to be related to energy consumption were chosen to coincide as closely as possible in point of time with available data for energy consumption. Energy consumption data were available for 112 world areas, and other data were available for a varying number of these same areas.

The demographic dependent variables were selected on the basis of four assumptions. (1) Development will produce a reduction of deaths in general --as measured by the crude death rate and especially from infectious and contagious diseases-- with a consequent increase in the expectation of life at birth as a result of improved diet, living conditions, sanitation, and medical services. (2) Birth rates decrease as a consequence of

^{2/} See, for instance, Edward G. Stockwell, "Some Demographic Correlates of Economic Development", *Rural Sociology*, XXXI, 2 (January, 1966), 216-24. In this article, using per capita income as the measure of economic development, the author evidently was forced to resort to grouping the 49 countries for which he found appropriate data into four categories and then to resort to using rank order correlation as a measure of association.

urbanization and related factors which accompany development. (3) The mean age of the population and the percentage of the population 15 years old or older increase as a consequence of reduced birth and death rates, and reduced birth rates diminish the annual rate of increase. (4) Educational levels rise so that higher percentages of the population complete a minimum of five years of education.

Economic variables were selected on the basis of three assumptions. (1) Development will result in increased consumption of steel and newsprint per capita in response to industrialization, changes in consumption patterns, and the greater reliance on mass communications. (2) The per capita consumption of calories of animal origin as food will increase. (3) In response to the shift from agriculture to industry, the following changes will occur in the economically active population. The percentage of men 15 years old or older who are economically active and engaged in agriculture (the primary sector) will decrease; the percentage of women 15 years old or older who are economically active will increase; the percentage of economically active women who are occupied in commerce, banking, and real estate will increase; the percentage of economically active men in professional and technical fields will increase; and, finally, that the percentage of the inactive population enrolled in school will increase.

Linear correlation coefficients were calculated, scattergrams were plotted for all of these measures, and a line was fitted to the data by inspection.

RESULTS

Low correlations were found for several of the variables and

the scattergrams for these did not reveal any other type of association. In others, unusual distributions of the variables made linear analysis inaccurate. The correlation with the death rate, for instance, was good— -0.59 —but the scattergram revealed distortions resulting from incomplete reporting of deaths, even though only countries which considered their reporting to be substantially complete were included.

Linear association were found for the four following economic variables: per capita consumption of steel and newsprint, percent of the economically active male population engaged in the primary sector, and the percent of economically active women employed in commerce, banking, and real estate. Romania, Bulgaria, Hungary, Russia, Poland, East Germany, and Czechoslovakia were excluded from consideration with regard to newsprint consumption. The government-controlled press in these countries placed a ceiling on newsprint consumption per capita so that, although considerable variation existed in energy consumption per capita among them, newsprint consumption was virtually the same for all.

Curvilinear association, in the form of a J curve, was found for the following demographic variables: crude birth rate, infant mortality rate, percentage of deaths from contagious and infectious diseases, and life expectancy. In order to enhance the comparability of the distributions, uniform scale values were calculated by equating the highest value of a given variable to 100 and the lowest to zero, with the remaining values receiving corresponding intermediate scores. In two instances (life expectancy and the percent of males in agriculture) the vertical scale was inverted to permit more direct comparisons. Distributions of the economic and demographic variables are closely similar among themselves, particularly with regard to the demographic variables.

DISCUSSION

Development as measured by energy consumption per capita is associated with a number of economic and demographic variables. The curvilinear association with demographic variables suggests three distinct levels of the impact of development on the vital processes. A strong negative correlation holds until energy consumption reaches 300 kilograms per capita, decreases between 300 and 2,000 kilograms per capita, and drops to close to zero beyond 2,000 kilograms per capita. At the level of development represented approximately by a 2,000 kilograms per capita consumption of energy, vital rates become relatively stable at a low level and life expectancy at a high level with but little room for either to continue its upward or downward trend as the case may be. Beyond this point, increases in energy consumption are reflected in the economic variables. There appear to be three phases, then, in the impact of development on vital processes. This suggests, moreover, that world areas may be meaningfully categorized by stages with regard to their level of development as reflected in vital rates by using the foregoing limits.

Economic variables, on the other hand, show little inclination to level off at higher values of energy consumption. The relationship between energy consumption and such economic variables as steel production is obvious. Likewise, newsprint consumption and women in white collar occupations reflect, in a linear relationship, the progress indicated by increasing energy consumption. One economic variable, however, shows tendencies to reach a limit. This variable, percent of the population in agriculture, cannot drop below the level needed to sustain the host population. Perhaps future scientific developments in agriculture will reduce this variable for some countries, but in

the current state of the arts, there appears to be a lower limit.

At this point in the procedure, the authors felt that the results, especially the J curves of the demographic variables, could be used to produce more a useful and sophisticated analysis. Of special interest was the uniformity of the J curves. On the uniform scale, the four curves were similar enough so as to be expressed by one equation, if one existed. Some mathematical investigation revealed that, in fact, one equation did exist for all four curves, and that this equation held regardless of the scale used. This equation is the exponential distribution $y = e^{-x}$ where x equals the independent variable, the level of consumption of energy, and y equals the dependent variable, whatever that variable may be. The relationship between the four J curves and the exponential distribution is clearly shown in Figure 1. By using a table of exponential functions, found in many mathematical handbooks, values for the distribution can be found for any desired level of energy consumption.^{3/} For purposes of analysis, the scale for the energy consumption is reduced by a factor of 1000; therefore 4000 kilograms (of coal) is expressed as 4.000. Keeping this in mind, Table 1 gives some values of e^{-x} for various values of x , the level of energy consumption.

^{3/} See, for instance, Charles D. Hodgeman, Samuel M. Shelby, and Robert C. Weast, *Mathematical Tables, From Handbook of Chemistry and Physics* (Cleveland: Chemical Rubber Publishing Company, 1959), pp. 153-59.

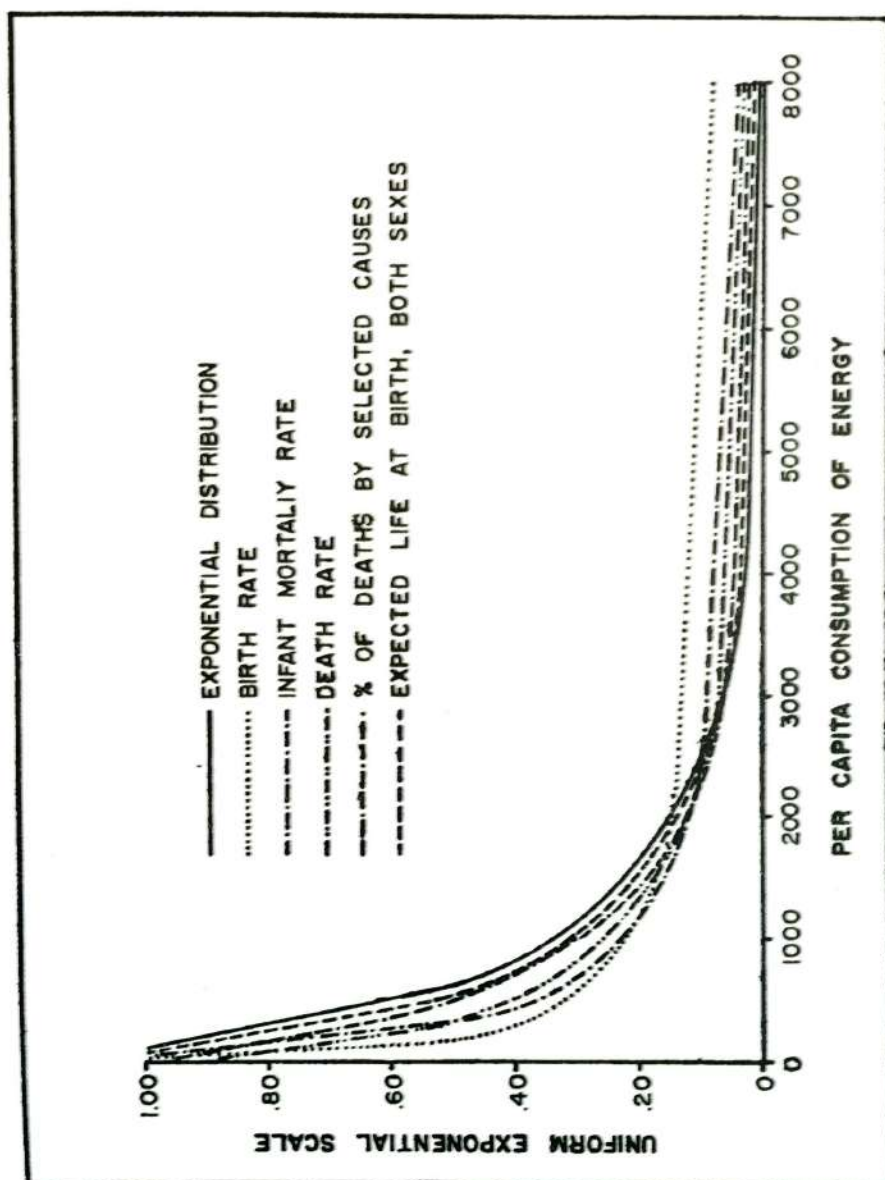


FIG. 1.—Energy consumption in relation to selected demographic variables

Table 1.- VALUES OF e^{-x} FOR VARIOUS VALUES OF THE
LEVEL OF ENERGY CONSUMPTION, x

x	e^{-x}
0.....	1.0000
500.....	.6065
1000.....	.3758
1500.....	.2231
2000.....	.1353
2500.....	.0821
3000.....	.0479
3500.....	.0302
4000.....	.0183
5000.....	.0067
6000.....	.0025
7000.....	.0009
8000.....	.0003

By placing constants into the basic equation, prediction equations were derived for each of the four variables. In addition, analysis revealed that the distortion caused by incorrect reporting for the death rate was corrected by use of the exponential distribution. The following prediction equations were developed for the demographic variables.

1. Infant mortality rate, $y = 235 e^{-x} + 15$.
2. Percentage of deaths from selected causes, $y = 55 e^{-x} + 6$.
3. Birth rate, $y = 48 e^{-x} + 14$.
4. Expected life at birth, both sexes, $y = 147 - 74 e^{-x}$.
5. Death rate, $y = 28 e^{-x} + 7$.

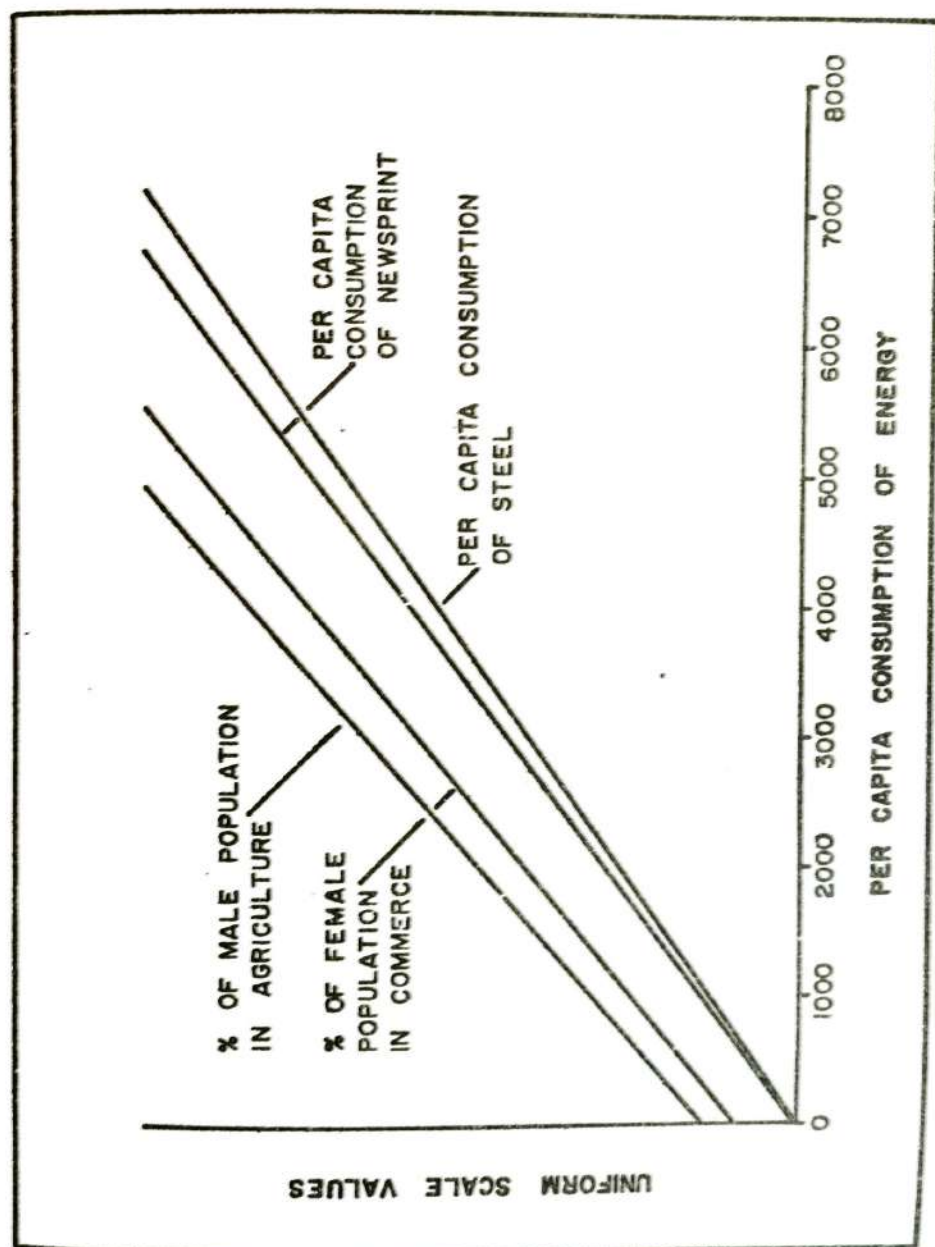


FIG. 2.—Energy consumption in relation to selected economic variables

Prediction equations were developed for the linear, economic variables. These equations are based on the least squares estimators of the prediction line and are shown in Figure 2. The following pre-iction equations were developed for the economic variables.

1. Percent of the male population in agriculture, $y = 68.5 - 0.01x$.
2. Per capita consumption of steel, $y = 27.5 + 0.077x$.
3. Percent of the female population in commerce, $y = 2 + 0.0035x$.
4. Per capita consumption of newsprint, $y = 0 + 0.006x$.

CONCLUSIONS

The significance of these equations, especially for purposes of prediction, is important. Energy consumption is relatively easy to obtain and is fairly accurate. Other demographic and economic variables are much more difficult to obtain and are often crude estimates. These equations can be used as an easy and accurate method of determining these economic and demographic variables.

The greater significance, however, lies in future research. At this point, there is no proof that the demographic variables are actually exponentially distributed. The degree of mathematical sophistication and the computer time required is beyond the scope of this paper. The relationship between the demographic variables and the exponential distribution is worthy of further research.

LOS INFORMES PRESIDENCIALES EN MEXICO

*Francisco Valdés Treviño **

En México, formular y rendir el Informe por parte del titular del Poder Ejecutivo Federal es observancia de la obligación que la Constitución impone.

Sólo en dos ocasiones el Presidente de la República tiene obligación de comparecer ante el poder legislativo: cuando toma posesión de su encargo, y el primero de septiembre de cada año, fecha en que el Congreso inicia su período ordinario de sesiones.

El fundamento jurídico de esta última obligación, se encuentra en el artículo 69 de la Constitución Política de los Estados Unidos Mexicanos que establece: "A la apertura de sesiones ordinarias del Congreso asistirá el Presidente de la República y presentará un informe por escrito, en el que se manifieste el estado general que guarda la administración pública del país". Este artículo tiene su lógica correspondencia con el artículo 65 de la propia Constitución que señala sobre el particular: "El Congreso se reunirá a partir del primero de septiembre de cada año para celebrar sesiones ordinarias...."

Mas la historia de México enseña que no ha sido siempre así. Escudriñando los antecedentes legales, desde que México se rige

* El Autor, quien ocupó el cargo de Secretario General de Gobierno en el Estado de Nuevo León durante el período 1976-1979, pertenece a la Planta de Profesores de esta Institución e imparte la materia Evolución de la Civilización Contemporánea.

por una Constitución, encontramos que, según la Constitución de 1824, el Presidente debía comparecer el primero de enero y no se especificaba que para rendir un informe de su actuación. En efecto, el artículo 67 del ordenamiento legal citado establecía textualmente: "El Congreso General se reunirá todos los años el primero de enero en el lugar que se designará por una ley. En el Reglamento Interior del mismo, se prescribirán las operaciones previas a la apertura de sus sesiones, y las formalidades que se han de observar en su instalación". Por su parte, el 68 decía: "A ésta asistirá el Presidente de la Federación, quien pronunciará un discurso análogo a este acto tan importante; y el que preside el Congreso contestará en términos generales.

Por su parte, la Constitución de 1857 señalaba en su artículo 63: "A la apertura de sesiones del Congreso asistirá el Presidente de la Unión y pronunciará un discurso en el que manifieste el estado que guarda el país. El Presidente del Congreso contestará en términos generales". Queremos hacer notar que tanto la Constitución del 24 como la del 57 establecían que el Presidente del Congreso contestará los informes en términos generales. Sin embargo, la vigente no señala nada sobre el particular. La respuesta que también en términos generales expresa en la actualidad quien preside el Congreso en el mes de septiembre, tiene su base jurídica en el artículo 69 del Reglamento Interior del citado Congreso.

En su artículo 62, la Constitución del 57, disponía: "El Congreso tendrá cada año dos períodos ordinarios de sesiones ordinarias: el primero comenzará el 16 de septiembre y terminará el 15 de diciembre; y el segundo, improrrogable, comenzará el primero de abril y terminará el último de mayo". El Presidente entonces tenía que informar dos veces al año, de donde se desprende que fue el General Porfirio Díaz, por sus continuas reelecciones, quien ha dicho mayor cantidad de tales Informes; sesenta y uno, para ser exactos, cifra a la que, afortunadamente, ningún otro

Presidente llegará, ni siquiera remotamente, gracias al sabio principio de no reelección que forma parte esencial de nuestra vida jurídico-política.

En los últimos tiempos, cada titular del Poder Ejecutivo ha rendido sus respectivos informes en un ambiente nacional donde impera el trabajo, la paz y la concordia. Pero no siempre ha sido así, algunos Informes fueron expresados en medio de vicisitudes porque también de vicisitudes estaba llena la vida nacional.

Cuando México inició su vida constitucional a partir de 1824, los informes presidenciales se caracterizaban por el repetido uso de los conceptos de independencia y libertad, en virtud de que la libertad y la independencia acababan de ser obtenidas después de años de lucha; inmediatamente después, en los años subsecuentes, el tema giraba en derredor del Federalismo o Centralismo que eran los dos tipos de regímenes republicanos que se discutían en aquel entonces. En los documentos presidenciales de la época era frecuente que los mandatarios dieran cuenta de amenazas bélicas internas o de invasiones extranjeras, particularmente de 1845 a 1848 cuando México sufrió la ignominiosa mutilación de su territorio.

Era usual también el señalamiento de la escasez de recursos materiales para atender las necesidades nacionales, entre las cuales destacaba la formación de un ejército poderoso que fuera leal al gobierno y que evitara nuevas invasiones.

Fue Benito Juárez, defensor de la justicia y escudado en la norma jurídica, quien llenó sus informes presidenciales con un contenido propio de la firmeza y entereza con que afrontó los graves problemas de su tiempo. Sabedor de que la razón y el derecho le asistían como Presidente de la República frente a los

enemigos internos y externos, sus Informes fueron siempre expresión de integración nacional y reafirmación de la mexicanidad.

Después de que la República termina victoriosa sobre el Imperio, se empieza a utilizar en los Informes términos como industria, agricultura, ferrocarriles, minería, telégrafos, moneda y otros más, que revelan los aires nuevos que respiraba el país. Las referencias a guerras intestinas y contiendas políticas fueron dejando su lugar a las acciones puramente administrativas.

Es así como ahora, en los Informes Presidenciales de nuestro tiempo ocupan espacios importantes los términos de reforma administrativa, energéticos, seguridad social, comunidad internacional, reforma política, inflación, reforma agraria, productividad y otros que denotan los actuales asuntos de importancia nacional; particularmente hay referencias continuas e importantes al Instituto Mexicano del Seguro Social, la Comisión Federal de Electricidad, Pemex, Conasupo y Coplamar, que son organismos derivados directamente del proceso constructivo de la revolución mexicana.

La vida pública de México se ha caracterizado en los últimos años por una voluntad del poder político de dar cuenta de sus decisiones en las formas y al través de los medios más diversos. En este sentido, debemos destacar que ahora la Constitución señala la obligatoria comparecencia de los Secretarios de Hacienda y Crédito Público y de Programación y Presupuesto ante la Cámara de Diputados, para que expliquen, respectivamente, las motivaciones de la iniciativa de la Ley de Ingresos y el proyecto de presupuesto para el siguiente año. A estas comparecencias se les hace amplia y precisa difusión en todo el país al través de la televisión y de los diarios.

Cada primero de septiembre, el titular del Poder Ejecutivo Federal cumple su obligación constitucional de informar a la Nación sobre el estado general que guarda la administración pública del país. Continúa siendo el acto formal más importante del Presidente de la República en tanto da cuenta de sus decisiones, analiza las circunstancias sociales, políticas y económicas de México, señala los futuros rumbos del país y expresa los criterios que sustenta para ejercer su mandato y afrontar las necesidades nacionales. Lo avanzado de las comunicaciones nos permiten recibir la imagen del acto y escuchar el mensaje presidencial al instante mismo en que se efectúa. Al siguiente día, a todos los rincones de nuestro territorio llega impreso su contenido. Sin embargo, la verdad es que, además de este informe constitucional, en nuestro tiempo el Presidente de México informa todos los días y desde las diversas tribunas sobre los criterios y acciones de su mandato. La importancia de los actos presidenciales y los medios de difusión tan avanzados en la técnica hacen que todos los días los mexicanos recibamos una oportuna y amplia información sobre las decisiones del primer mandatario.

La reunión de la República que se efectúa todos los años el 5 de febrero, es foro desde el cual José López Portillo expresa las tesis políticas que sostiene el régimen que preside. Cada 18 de marzo, la celebración de la expropiación petrolera, también es ocasión adecuada para que el Presidente explique su política en relación al petróleo. Las visitas presidenciales a otros países, iniciadas virtualmente en forma amplia por el extinto Presidente Adolfo López Mateos, y continuada por los sucesores hasta el propio López Portillo, han sido también foros propicios para que el Presidente manifieste la posición de México en cuanto a relaciones financieras, comerciales y culturales en el marco internacional; en este orden de ideas, la misma Organización de Naciones Unidas, ha sido plataforma para expresar al mundo entero

la política que México sustenta en relación al uso nacional de energéticos, a la cooperación internacional y a la confraternidad entre las naciones, entre otros temas.

El hecho de que el Presidente de México informe cotidianamente de sus actos, ha propiciado que el mensaje del primero de septiembre se convierta cada vez más en un mensaje esencialmente político, en el cabal sentido del término. Es en esta comparecencia ante el Congreso, en la que el titular del Poder Ejecutivo Federal señala los criterios de la administración pública que preside en todos y cada uno de sus ramos. Las cifras que antes inundaban materialmente todos los textos de los informes, ocupan ahora los anexos que acompañan al documento, y en la más alta tribuna de la República el Presidente expresa el substractum de su política. Podemos, por tanto, afirmar que la historia del país registra ahora un nuevo estilo y una nueva etapa sobre los informes presidenciales.

A lo largo de esa historia las formas y métodos del Informe del Presidente de México han ido evolucionando como ha evolucionado también, afortunadamente para bien, la vida del país. No nos asaltan ahora dudas sobre nuestra forma de gobierno como en los principios de nuestra vida constitucional; no nos inquietan posibles desgajes de nuestro territorio como a mediados del siglo pasado. Afrontamos ahora los problemas propios del desarrollo, pero sin titubeos, con firmeza en las decisiones y con la seguridad que da una madurez política alcanzada a través de nuestra historia, y cuya muestra evidente lo es, cada año, el Informe Presidencial.

Cómo serán los Informes Presidenciales en el futuro, digamos, dentro de veinte años? Seguramente se referirán también a

problemas, pues cuando se solucionen los del presente nacerán otros; es condición inseparable del progreso. Por los rumbos que ha llevado el México moderno podemos asegurar que nunca serán dramáticos, que siempre serán solucionables, porque la responsabilidad y la inteligencia con que el poder público ejerce sus funciones, garantizan que México encontrará siempre los caminos de su realización; cuenta para ello con el bien máspreciado que país alguno pueda tener: el trabajo y la audacia de todos sus hijos, pues en la misión de engrandecer al país nadie debe sentirse postergado, cualquiera que sea su condición económica o su ideología política.

Por eso ningún mexicano es ajeno al Informe Presidencial; en él se refleja la vida nacional de la que todos formamos parte. Somos sujetos activos y receptores al mismo tiempo de las transformaciones sociales. Cada vez el informe presidencial motiva que reflexionemos aún más sobre nuestra responsabilidad individual y colectiva.

BIBLIOGRAFIA

XLVI Legislatura de la Cámara de Diputados, Derechos del Pueblo Mexicano: México a través de sus Constituciones. Imprenta de la Cámara de Diputados, México, 1967.

XLVI Legislatura de la Cámara de Diputados, Los Presidentes de México ante la Nación: Informes, Manifiestos y Documentos de 1821 a 1966, Imprenta de la Cámara de Diputados, México, 1966.

Tena Ramírez, Felipe: Derecho Constitucional Mexicano, Editorial Porrúa, México, 1978.

PLANIFICACION DE LOS RECURSOS HUMANOS

*Lucinda Díaz de la Garza **

La historia moderna de la planificación de recursos humanos nace al final de la segunda guerra mundial sobre todo en el seno de los países de la Organización para la Cooperación y Desarrollo Económico (OECD). Estos países se enfrentaban a la reconstrucción de Europa con una gran carencia de recursos humanos adecuadamente calificados y al desafío militar y tecnológico de otras potencias. Esto motivó la necesidad de planificar sus recursos humanos.

La planificación de recursos humanos recibe un fuerte impulso en los años sesentas, a partir del ejercicio de planificación que supuso el Plan Regional de Mediterráneo. Este ejercicio, aunque deficiente en sus resultados, produjo un gran acervo de experiencias y conocimientos utilizables.

Los resultados que se desprenden de los ejercicios de planificación se reducen a recomendaciones muy generales sobre los niveles de calificación requeridos por la economía en un momento o período dados, siendo precisamente esta generalidad, el punto fuerte de la planificación de recursos humanos. Conforme se desea más detalle en las especificaciones, sobre los niveles de calificación, se encuentra que las recomendaciones que se pueden desprender de la planificación de recursos humanos se vuelven frágiles y más sujetos a errores.

* La autora del presente trabajo, es exalumna de esta Institución y actualmente presta sus servicios en el Instituto Nacional de Estudios del Trabajo.

En general, se consideran cuatro enfoques para las técnicas de la planificación de recursos humanos. El primero de ellos, se conoce con el nombre de **comparaciones internacionales**. Históricamente fue el primero y se hizo uso de él porque se carecía de los datos necesarios para intentar otra metodología diferente. Lo que el método intenta hacer es comparar un país con otro en términos de sus respectivos desarrollos educativos y económicos. Del país de mayor desarrollo económico se desprenden recomendaciones para el menor desarrollo en relación a la situación educativa que prevalece en este último. Este método supone que el desarrollo económico es el resultado del desarrollo educativo y confunde de esta manera correlación con causalidad, pues bien podría ser que aún cuando se dé una correlación estrecha entre el desarrollo educativo y el desarrollo económico, ésta esconda el fenómeno de que a mayores niveles de desarrollo económico se lleven a cabo mayores consumos de educación, de lo cual se desprendería una causalidad en sentido contrario a la propuesta originalmente por el método. Esta metodología no es recomendable para ser usada por sí misma.

El segundo enfoque se conoce como el de la **demandas social**. Este enfoque no parte de las necesidades de mano de obra sino de la demanda que la población hace de los servicios educativos y trata de satisfacerla. El enfoque se apoya en proyecciones demográficas por grupos de edad, así como de la propensión a consumir educación con base en indicadores como la elasticidad educación-ingreso. Este enfoque supone que a mayor educación corresponde un mayor desarrollo o crecimiento económico.

El tercer enfoque conocido como el de **análisis de costo beneficio** consiste, como su nombre lo indica, en comparar y evaluar los costos y beneficios de cada uno de los niveles y tipos de educación. Se intentará así reasignar los recursos

físicos, financieros y humanos necesarios, de tal manera que se expandan aquellos tipos y niveles de educación o capacitación que proporcionen los mayores rendimientos económicos al mismo tiempo que se intenta que los rendimientos económicos de la educación (capital humano), sean iguales o mayores que los rendimientos proporcionados por el capital físico. Este enfoque supone también que la educación se traduce en rendimientos económicos; que se pueden calcular los incrementos en los ingresos que son debidos a incrementos en la educación y que de alguna manera estos ingresos son una aproximación a los beneficios totales económicos y sociales que se desprenden de la educación, la capacitación y el adiestramiento.

El cuarto enfoque se conoce con el nombre de los **requerimientos de mano de obra**, que integra dos procesos: uno traduce el crecimiento del Producto Nacional en número de trabajadores y la calificación necesarios para lograr determinado crecimiento y el otro, transforma los grados de calificación requerida a niveles y tipos de educación. En este enfoque existen supuestos similares a los anteriores como de que la educación se corresponde a términos de productividad y que la productividad se traduce en ingreso.

Por otra parte, la teoría ortodoxa o también llamada **teoría del capital humano** hace poca referencia a lo que integra la educación como enseñanza y supone que la educación incrementa la capacidad intelectual del sujeto y que la capacitación mejora las destrezas requeridas para el desempeño del trabajo. Sin detenerse mucho en esto, la teoría ortodoxa hace dos afirmaciones importantes, a partir de las cuales construye su teoría. Estas afirmaciones son, primero que todo incremento en la educación o capacitación resulta en un incremento proporcional en la productividad del sujeto y segundo, que todo incremento en la

productividad resulta, a su vez en un incremento equivalente en el ingreso que el sujeto percibe. La teoría del capital humano tiene su origen en la teoría económica neoclásica, que parte del supuesto de que a los factores de la producción se les retribuye en la misma medida en que éstos contribuyen al producto. La planificación de recursos humanos nace en el seno de esta teoría e implícitamente mantiene la relación directa entre educación y productividad y entre productividad e ingreso.

Sin abandonar totalmente la teoría del capital humano, existe lo que se conoce como Credencialismo, o sea que en realidad la educación incrementa el ingreso pero no incrementa la productividad, ante una mayor oferta de mano de obra con educación, los empleadores otorgan los puestos de trabajo a aquellos sujetos con mayores grados de educación, aún cuando la cantidad y calidad de la educación sobrepase aquella requerida por el puesto de trabajo para el cumplimiento eficiente del mismo. De esta manera la población en busca de empleo, intenta adquirir mayores grados de educación, no por la relación de la educación con la productividad sino porque la mayor cantidad de educación les da una credencial superior por tener acceso al mundo de trabajo en situaciones de ventaja. Con esto se provoca una devaluación de la educación a los ojos de los empleadores, quienes exigen mayores niveles de educación.

Otra tesis que influye en la planificación de Recursos Humanos es la del mercado dual de trabajo, que se refiere a la existencia de dos mercados de trabajo paralelos; uno moderno y otro tradicional. Algunos autores suponen el origen de la dualidad en fenómenos de orden cultural y otros más lo hacen en la tecnología. Esta corriente considera la educación con funciones diferentes según se sitúe en uno de los mercados de trabajo o en otro. Los que enfatizan los aspectos culturales

parten de que, un incremento en la educación de un individuo que ingresa al mercado de trabajo tradicional no necesariamente incrementará su ingreso como sucede comunmente en un sistema de castas. Los que enfatizan los aspectos tecnológicos, se basan en la competencia por el empleo y significa que la productividad no está en el individuo sino en el emplee. Los empleos del sector moderno usan máquinas de alta productividad y los del sector tradicional usan técnicas de baja productividad. Lo que importa es el empleo y no el empleado.

En este tema, existe también la tesis del mercado segmentado de trabajo que identifica a los niveles de salarios (ingresos) determinados por un complejo de elementos históricos, sociales, políticos y culturales y niega el principio neoclásico de que el salario (ingreso) quede determinado por la productividad del trabajador. Sin embargo, la posibilidad de que la educación incremente la productividad del individuo no se descarta, esto se logra por otros caminos diferentes de los propuestos por la teoría del capital humano. Además de que la educación cumple una función político social, necesaria e íntimamente ligada a la reproducción del capital y por tanto de las relaciones de producción.

La tesis del mercado segmentado de trabajo se ubica en la metodología marxista y da gran atención al proceso histórico, a las variaciones estructurales, a la política, y en general a la lucha de las clases que la educación tiene dentro de una economía capitalista y la distingue de la función que tiene la educación en una sociedad socialista. Así la educación cumple funciones diferentes según la clase social a la cual pertenece aquel que la adquiere, y así como hay diferentes segmentos en el mercado, existen diferentes tipos de educación. Podría asumirse que en un extremo está la educación que enseña a mandar y en el otro

extremo se encuentra la educación que enseña a obedecer. Existe una educación funcional a cada segmento del mercado de trabajo y no se da movilidad ni entre los diferentes tipos de educación y el adiestramiento incrementan en algo la productividad del sujeto pero no por intermedio del mejoramiento de la capacidad intelectual o de la destreza manual exclusivamente, sino sobre todo por la introyección de hábitos y actitudes, como son por ejemplo: los hábitos de puntualidad, orden, limpieza y en el caso de los trabajadores, las actitudes que permiten la asimilación correcta de órdenes y la resistencia al aburrimiento, entre otras, respondiendo de esta manera a la pregunta sobre lo que en realidad enseña la escuela.

La planificación de recursos humanos generalmente integra una serie de supuestos que determinan específicamente su relevancia económica de desarrollo. Los supuestos se refieren a: 1) el concepto de recursos humanos, 2) concepto que se tenga sobre el objetivo de la planificación de recursos humanos, 3) el tramo de edades comprendidas, y 4) el número de instituciones que se comprometan.

En primer lugar, la planificación de recursos humanos contiene una noción de recurso humano con la cual se compromete. Esta noción puede ir desde la que entiende a la persona como un instrumento de la economía, hasta la que se compromete con un concepto de individuo en toda su complejidad y riqueza y que busca resultados socialmente útiles sin ir en contra de la libertad y el desarrollo integral de la persona misma.

En segundo lugar, los objetivos de la planificación de recursos humanos también contienen supuestos importantes, que habrá que explicitar. No es lo mismo la planificación que busca adecuar la oferta de mano de obra a los requerimientos del mer-

cado, que la planificación que cuestione la racionalidad misma de las demandas del mercado y busque por el contrario adecuar la estructura de producción a las demandas en cantidad y calidad que hace la población. Son muy distintos los supuestos en base a los cuales se hace una proposición o la otra.

El tercer grupo de supuestos comprende lo referente al tramo de edades sobre las cuales la planificación hará énfasis. La planificación puede interesarse exclusivamente por el tramo de edades que comprende la educación superior o la educación media, por ejemplo. Sin embargo, las posibilidades en este sentido pueden abarcar desde menos nueve meses hasta el momento de la muerte; una planificación integral de recursos humanos tendría que considerar el tramo total de vida.

Finalmente el supuesto de las instituciones que se consideran dentro de un ejercicio de planificación. La planificación que ponga atención exclusivamente sobre las instituciones educativas estará suponiendo, que dadas las circunstancias concretas, las instituciones de salud y alimentación no son, en ese momento, al menos, importantes en el logro de los resultados de formación que se pretenden. Sin embargo, en un planteamiento más completo y sobre todo desde la circunstancia de los países en vías de desarrollo, la planificación de recursos humanos muy probablemente tendrá que considerar otros aspectos como son la salud, alimentación y la seguridad social en general.

Proceso de Formulación del Plan de Recursos Humanos.^{1/}

La planificación de los recursos humanos debe ser concebida como parte de la planificación más amplia del desarrollo eco-

^{1/} Dr. Esteban Lederman. IEPES, Santiago de Chile, Sept. 1964.

nómico y social, por lo tanto es esencial que el proceso de planificación de los recursos humanos se formule a la luz de los objetivos políticos, económicos y sociales del plan de desarrollo.

De tal manera, estará basado en tres puntos fundamentales: la expresión del empleo, en forma de una variable meta concordante con otras tales como el máximo crecimiento posible del producto; los requerimientos de mano de obra que plantea un plan de desarrollo económico; y la expresión de ellos en términos de necesidades formativas para integrarse a las metas de la planificación educacional. Es necesario considerar que los tres puntos anteriores no constituyen etapas aisladas, todo lo contrario, ellos están estrechamente vinculados y relacionados en el proceso de planificación en un conjunto.

Uno de los elementos claves que permite interactuar para fijar las metas de empleo -tanto globales como sectoriales- y los diversos requerimientos de mano de obra es el tipo de ubicación sectorial de la tecnología, que a su vez determinará la productividad y la magnitud del esfuerzo en cuanto a inversiones se refiere. En otras palabras, hay que tener presente que la eliminación de la subocupación o desocupación está unida estrechamente a la tasa del desarrollo, a la selección de tecnologías, y consecuentemente a los requerimientos de trabajo y a las calificaciones de mano de obra.

La ocupación global en una economía es producto de un conjunto de empleos y ocupaciones específicas y concretas, en las cuales y en cada una de ellas se necesitan recursos humanos con calificaciones también más o menos específicas. El logro de las metas ocupacionales específicas no puede hacerse con abstracción de las relaciones que existen entre diversos niveles de calificaciones y empleo.

En toda sociedad que entra al camino de la industrialización aumenta la división del trabajo, lo que lleva implícito las "relaciones técnicas" entre diversos niveles.

La planificación de referencia debe contemplar el desarrollo de los recursos humanos por dos tipos de canales o grupos meta:

- a) Educación de las nuevas generaciones y
- b) Entrenamiento o cursos intensivos a aquellos que ya están en la fuerza de trabajo.

Además de las funciones consideradas, un plan debe establecer un sistema que integre y permita analizar las estadísticas de mano de obra, de tal modo que sea posible identificar y anticipar los problemas de los recursos humanos.

Por último, debe contemplar la formación de un aparato administrativo capaz de llevar adelante la formulación, ejecución y control de programas de recursos humanos. Este mecanismo administrativo deberá ser concebido en el marco de un sistema nacional de planificación condicionado por las orientaciones de la política de desarrollo, que a su vez determinaran la preparación, la ejecución y el control de planes y programas formulados con la corriente sistemática de información. Es muy difícil que exista la planificación de recursos humanos como proceso sin cumplir éste.

Así como la planificación de recursos humanos se concibe como parte de la planificación del desarrollo, en consecuencia las metas físicas y metas de ocupación del país, deben prever las necesidades de mano de obra que aún en ausencia de un plan general, la previsión adecuada de los recursos humanos permitiría

evitar en parte los problemas de desocupación -o llamar la atención sobre ellos- y posibles estrangulamientos futuros, en los recursos humanos estratégicos.

Las proyecciones de los requerimientos futuros de recursos humanos deberán ser consistentes con las metas globales y sectoriales del desarrollo. En ausencia de un plan general -aún en su presencia- las proyecciones de recursos humanos deberán basarse en una serie de juicios expectativos sobre el desarrollo futuro del país, producto de la experiencia y el estudio de las tendencias históricas y del posible efecto sobre ellas de medidas de política económica futura. Si bien esto significa la existencia de elementos subjetivos en los juicios, en la medida que exista un plan de desarrollo y se presenten varias hipótesis o alternativas de proyección, mayor será el valor científico de ellos, identificándose con los objetivos involucrados en las metas del plan.

La formulación de un Plan de Desarrollo de Recursos Humanos debe partir de un diagnóstico del problema que permita resolver una serie de condiciones históricas y definir cualitativa y cuantitativamente una situación inicial, con ello se dispondrá del marco de referencia para proponer alternativas de cambio y posibles acciones, de acuerdo a las magnitudes y características de las necesidades de formación de los recursos humanos.

De esta manera el diagnóstico debe cumplir con una serie de requisitos como son:

- Que permita explicar integralmente el papel de los recursos humanos en la dinámica económica y social de la región.
- Que ayude a identificar los factores de evolución histórica

del proceso productivo regional.

- Que sea posible enmarcar la función de la política económica como resultante y efecto de las características de los recursos humanos.
- Que se resuelva un sistema coherente de interrelaciones sociales y económicas con el objeto de definir las necesidades y requerimientos de formación.
- Que permita determinar cualitativamente la magnitud y características de las necesidades y requerimientos de formación.
- Que permita determinar cuantitativamente la magnitud y características de las necesidades y requerimientos de formación.
- Que sea factible realizarlo continuamente para analizar la evolución del problema y los resultados que se deriven del Plan, en caso de ponerlo en marcha.
- Que integre las formulaciones de política económica y social como condicionantes de la dinámica futura de la región.

Metodológicamente, establecer estos requisitos, significa que el análisis de los recursos humanos debe partir de una serie de premisas relacionadas con la heterogeneidad del sistema productivo y la relación de éste con las acciones de política económica y social.

En Tabasco se llevó a cabo un estudio de diagnóstico con un esquema que propone limitadamente la explicación de una serie de aspectos de la política social, incorpora la posibilidad de identificar las características ocupacionales mediante indicadores

del sistema productivo como resultados del proceso de cambio económico.

Así se presentó una opción para analizar las disponibilidades de recursos humanos como resultado del proceso económico-social, centrando la atención en la dinámica educativa y de población, cuyas características están dadas por el nivel de desarrollo de esa entidad.

Así los recursos humanos, quedó identificado en este análisis como un ente generador de riqueza en el sistema productivo y por lo tanto, el factor principal en la producción, que cumple funciones estructuralmente establecidas en el conglomerado de la fuerza de trabajo. Estas funciones varían en el tiempo y en los sectores económicos. Lo que se traduce en una diversidad de responsabilidades. Así, las características de estas "responsabilidades" productivas estarán condicionadas por las siguientes premisas:

- a) El sistema económico está integrado por niveles diferenciales de participación sectorial y dependerá de la importancia relativa del sector industrial, el grado de heterogeneidad del sistema productivo.
- b) La heterogeneidad del sistema productivo se manifiesta en diferenciales de productividad, de tecnología y de absorción de mano de obra, las que a su vez están condicionadas por el tipo de competencia que prevalece en el mercado de bienes y servicios.
- c) La estructura ocupacional del mercado de trabajo está determinada por los diferenciales de productividad, de tecnología y capacidad de absorción, los que a su vez se traducen en

requisitos de puestos de trabajo o calificación para el trabajo.

- d) Los niveles de instrucción de la fuerza de trabajo ocupada están directamente relacionados a la estructura ocupacional y a la heterogeneidad productiva.
- e) Los niveles de instrucción de la fuerza de trabajo reflejan la capacidad que el sistema educativo ha tenido para satisfacer la demanda social de educación.
- f) Los niveles de calificación de la fuerza de trabajo están relacionados directamente con los niveles de instrucción, capacidad y modalidades del sistema educativo.
- g) El crecimiento demográfico está determinado por las características del proceso de desarrollo económico y la heterogeneidad productiva de la entidad.
- h) La estructura de población producto del crecimiento demográfico condiciona la magnitud de los recursos humanos disponibles y la eficiencia del sistema educativo, la calidad.
- i) El crecimiento de la fuerza de trabajo está determinado a corto plazo por la dinámica del sistema productivo y a largo plazo por la evolución poblacional.

A partir de estas consideraciones se ha establecido el esquema de análisis para la determinación de los requerimientos de formación: por una parte, un enfoque sectorial que permite distinguir los diferenciales productivos y su relación con la estructura ocupacional; por otra, la dinámica poblacional y educativa como condicionantes de las características cualitativas

de los recursos humanos.

Con base en la determinación de los requerimientos de formación se propone una estructura ocupacional "adecuada" bajo supuestos de producción, derivados del propio análisis de la entidad. En seguida, se establecen las limitaciones del sistema educativo y las necesidades de capacitación que deberán atenderse en forma inmediata.

ESQUEMA DE ANALISIS DE LOS RECURSOS HUMANOS

