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The Mexican Development Strategy: Retrospect and Prospect

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THE MEXICAN DEVELOPMENT STRATEGY:
RETROSPECT AND PROSPECT

By

Sara J. Scherr

December 1975

No. 75-28

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Statistical Reliability of Data

A good deal of the subsequent discussion in this paper will involve the use of statistics from various sources describing the Mexican economy and society. Hence, before beginning, I would like to caution the reader about their reliability.

Prior to the Revolution of 1910, very few statistics were gathered in Mexico for anything other than import-export accounts, which were fairly accurate, and head counts and the like for tax purposes, which involved enormous errors due to false reporting. What data we find on the domestic economy is usually inaccurate either through honest calculation error or political manipulation.

Very few statistics were collected during the 1910 Revolution and early post-Revolution period until 1925. Since 1925, the Direccion General de Economia Rural, part of the Ministry of Agriculture, has made estimates of agricultural production. These statistics are infinitely more reliable than those pre-1910, but far from perfect. Since 1929, a national census has been taken every ten years, and complete correlation between Ministry of Agriculture and Census data has still not been achieved. The Census data can generally be considered more reliable.

The first category of statistical problems lies in data collection itself. As in most underdeveloped countries, the institutional framework for collecting data is small, although Mexico's is improving all the time. Thoroughness of the degree we would require in the United States is simply too costly for Mexico. Such high costs are involved in adequate coverage of remote regions that statistics on these are often just left out. District reporting is often used, and if no report is returned, there is no count made at all.

Commercial marketings alone are often used to estimate agricultural production, ignoring production for the personal consumption of the farmer. Farmers may underreport crops in order to decrease their taxes. Where they do not keep track for their own selves of business expenses and profits, it is indeed difficult to obtain by recall such information as animal feeding or construction costs or hours of labor. Where most storage is on individual farms, estimates of storage are very difficult.

The second category of problems lies in interpretation of data that is made available. Misinterpretation may come from the biasing of household consumption statistics through changes in household size, or the use of expenditure data rather than quantities to determine the make-up of production and consumption costs. Wage series reported are generally based on the legal minimum wage, not real wages paid. Price indices are usually based on Mexico City, which is largely unrepresentative of regional economic conditions. Different sources calculate gross domestic product (GDP) and other indicators with different methods which may not be comparable. The true nature of land tenancy is disguised by falsified documents covering large landholdings and the significant ejidal renting that goes on but is never legally recorded.

The third category of problems is that much statistical information never gets officially reported. Some has just never been analyzed, and never will unless some eager M. S. candidate gets his (her?) hands on it. Current data on any topic is hard to get. As I began writing this in October 1975, results of the 1970 Mexican Agricultural Census were just being made available to the general public.

All complaints above notwithstanding, statistics do provide at least ball park estimates of the magnitude and direction of economic and social trends. If one is sufficiently critical of them, and cross-checks whenever possible, such quantification is useful and necessary in any study. Such, hopefully, is their use in the following pages.

THE MEXICAN DEVELOPMENT STRATEGY: RETROSPECT AND PROSPECT*

By

Sara J. Scherr

CHAPTER I

The Mexican Economic "Miracle" - The Equity Problem

The "Miracle"

The "Mexican growth miracle" is frequently discussed in development literature. It refers to the truly spectacular economic growth which the country has experienced during the past fifty years - growth of at least five percent per year since the early 1940's. Between 1940 and 1970, GDP grew roughly six times (See graph 1). Manufacturing led the way in this growth, as the primary sector became less and less important. Trade began its growth spurt in the 1950's, the service sector leading in the 1960's. By 1972, Mexican manufacturing capacity had become so sophisticated that only three of the twelve major machine industry could not be efficiently produced in Mexico: ships, locomotives, and turbines and generators - no mean achievement for an "underdeveloped" country.

Population growth has reached the (alarmingly) high rate of 3.5% per year, due to a precipitous drop in the mortality rate from 25 per thousand population in 1930 to 9.9 per thousand in 1970. The birth rate in 1970 was 43.4 per thousand, pretty much the same as in 1930. The population of Mexico is now (by the 1970 Census) 48,225,238.

An even more important measure of general welfare improvement is the decline in infant mortality. Between 1960 and 1970 alone, the national 1/ average dropped from 74.2 per thousand live births to 63.7 per thousand. Diseases of the poor^{2/} in 1950 claimed 83.6 percent of all deaths: by 1965, only 52.7 percent. Food consumption per capita in Mexico increased 50 percent between 1934/38 and 1960 (2).

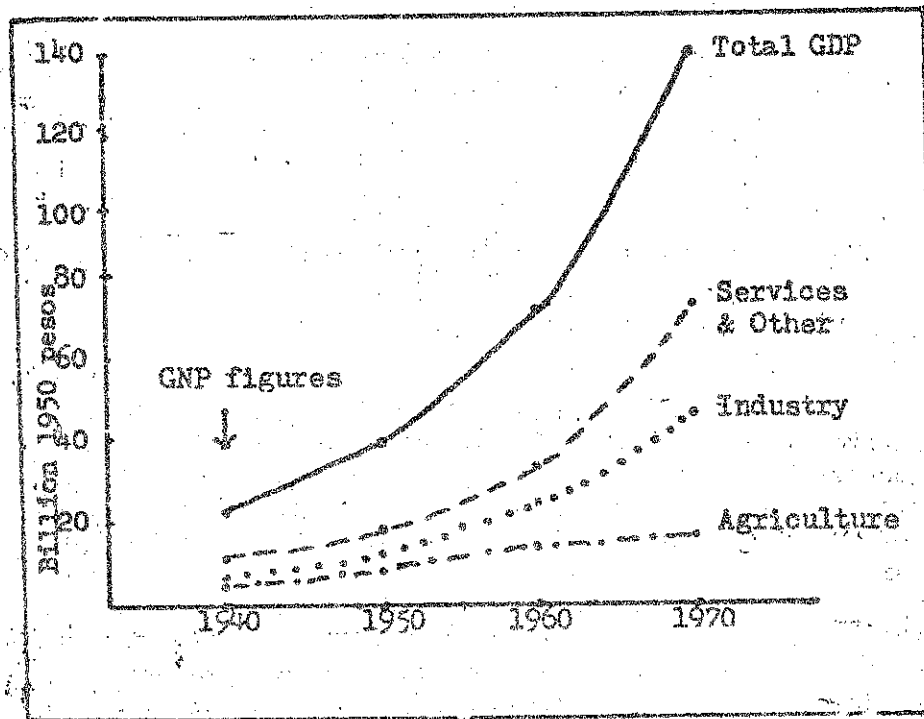
Another sign of the modernization of Mexico is its shift from a predominantly rural to predominantly urban living pattern. In 1930, only 33.5 percent of all Mexicans lived in cities: by 1970, 58.6 percent did so (3, p. 388). This move has primarily been for economic motives --

* In slightly modified form this paper was first submitted as part of the requirements for Agricultural Economics 660: Food Population, and Employment, Fall Term 1975.

1/ Nevertheless, there is a far way to go, as is revealed by the range among states from 26.7 to 102 per thousand live births.

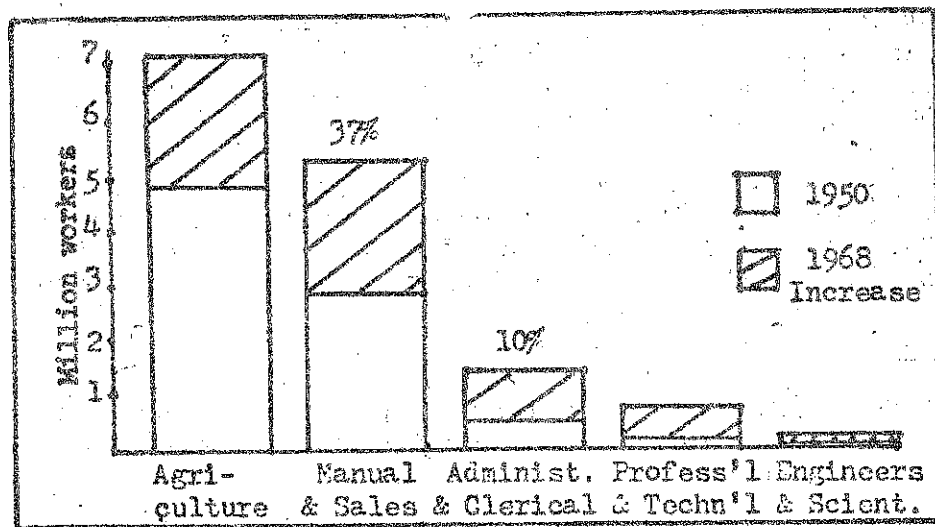
2/ Diphtheria, tuberculosis, measles, small pox, pneumonia, anemia, bronchitis, intestinal diseases, complications of birth and pregnancy.

* Graph 1. Growth of Mexican Gross Domestic Product*



* Secretaría de Recursos Hidráulicos, Prontuario Estadístico de la SRH, 1974, p.121.

Graph 2. Occupational Classes 1950-68 *



*L.M. Goreaux and A.S. Manne, Eds., Multi-Level Planning (North-Holland Publishing Co.: London, 1973), p.63.

a wise one, too. In 1960, over half of rural workers earned less than \$1250 pesos per month. Less than a fifth of urban workers earned so little (3, p. 80).

Because of the lowered infant and total mortality, a very substantial portion of the population is in the "dependent" age group. The economically active population (EAP) of Mexico (those older than fourteen and younger than sixty) dropped from 58 percent in 1930 to 53 percent in 1960 (2, p. 132). Nevertheless, the earning power and productivity of workers is rising to partially offset the ill effects of this tendency. There has been a large increase in the numbers of trained and educated individuals in the work force (See graph 2). Professionals, technicians, engineers and scientists still amount to only one percent of the EAP. A significant ten percent, however, are administrative and clerical workers, and the number of people working in manufacturing, sales and other non-highly skilled, but nevertheless "modernized," work has grown to include 37 percent of the EAP.

Mexican foreign trade has changed drastically since 1930. Exports have tilted away from the colonial era minerals and fuels, toward a highly diversified agricultural and forestry trade, and includes many manufactures as well. Due to the import substitution policies of the governments of Mexico, and agricultural self-sufficiency, imports have moved considerably away from consumer items, toward a high level of capital goods for investment.

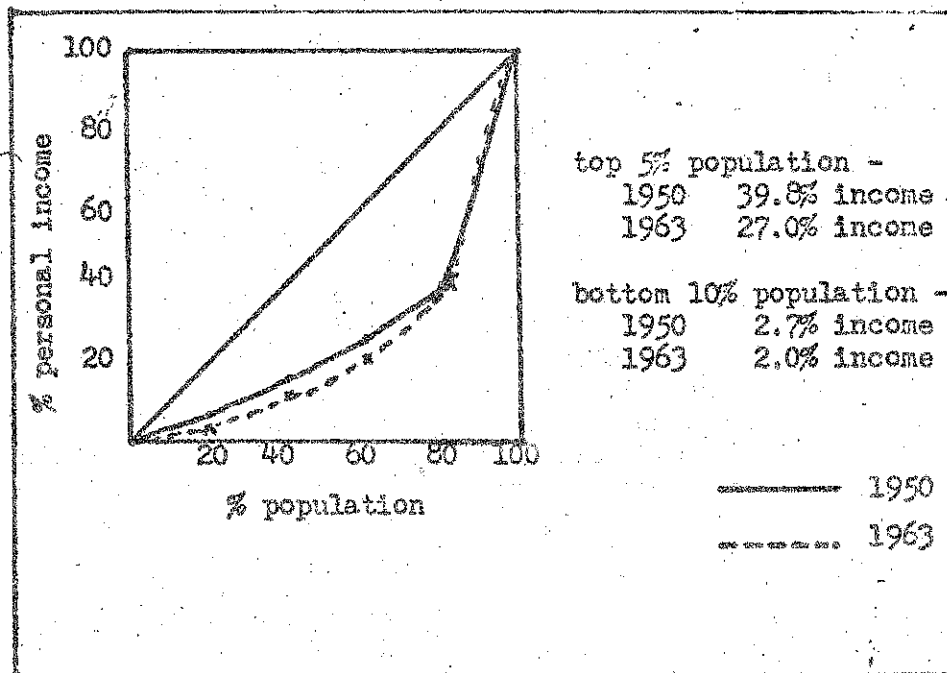
Mexico has been woven together with a vast system of new roads and other communications infrastructure. The major cities of Mexico rival any in the world for cultural achievement and sophisticated entertainment. Modern, industrial civilization with its many potential benefits now plays a major role in Mexican life.

The Distribution Dilemma

This growth and modernization of Mexico has been a remarkable achievement, without any doubt. Coming today into the forefront, however, is the unavoidable evidence that at least half of the Mexican population has been untouched by this progress. Those at the bottom of the economic ladder have actually experienced an absolute decline in living standards as a side effect of Mexican development strategy. Mexico is becoming known among students of development as one of the classical cases of "growth without equity" -- of policies that favor the full, rapid modernization of the few over the slower modernization of the masses.

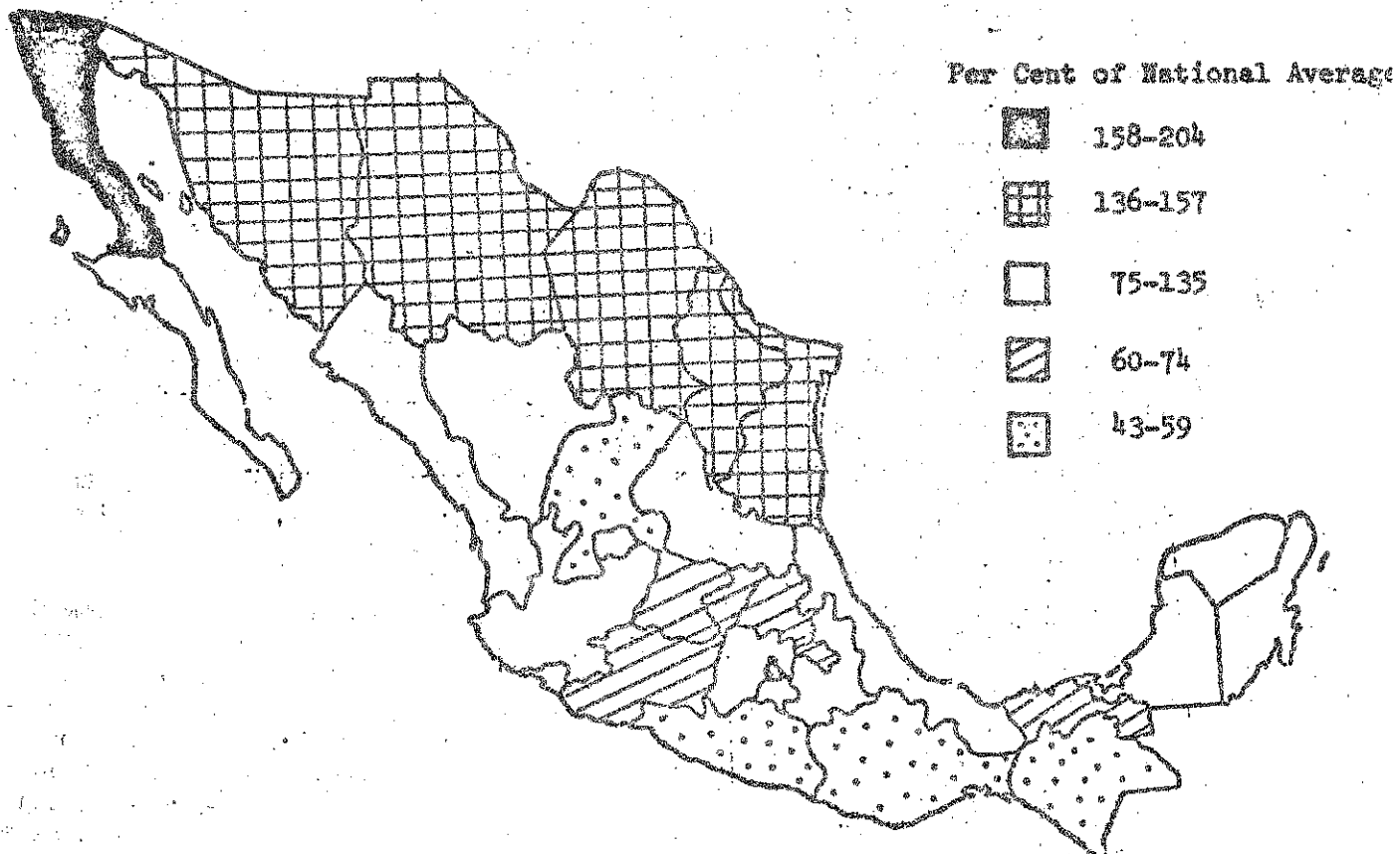
While immediately after the 1910 Revolution, there was an improvement in income distribution that continued up through the Cardenas years (1935-40), after this, the pendulum swung the other way. See graph 3. Although the share of national income accruing to the richest citizens (top five percent) has declined from almost 40 to 27 percent, the share of the poorest ten percent has also declined from nearly three to two percent. The portion of GDP since 1939 going to wages and salaries has also diminished in comparison to that going to capital ownership (1, p. 217). This was particularly so during the 1950's, but has improved since.

Graph 3. Lorenz Curve for Mexico *



*Clark Reynolds, The Mexican Economy, (Yale U. Press: New Haven, 1970), p.76.

Map 1. Welfare Index for Mexico 1960 *



*David Barkin and Timothy King, Regional Economic Development: The River Basin Approach in Mexico (Cambridge U. Press: Cambridge, 1970), p.68.

Industrialization has been very regionally concentrated such that Mexico City, Puebla, Guadalajara and Monterrey supply roughly 80 percent of the nation's industrial production (3, p. 169). Sources of imports and exports for the foreign sector also reveal marked regional discrepancies. A quarter of all exports come from Mexico City and another quarter from Tamaulipas (the leading agricultural exporter), Baja, California and Nuevo Leon together. In turn, almost three fifths of all imports head for Mexico City, and another one fifth for Nuevo Leon (primarily Monterrey), the state of Mexico (primarily Toluca), Coahuila and Tamaulipas (2, p. 131).

High productivity and income per capita are concentrated predominantly in the northern states, which have low population densities and a high level of agricultural and industrial development. These variables are lowest in the high-density Center states and the underdeveloped South Pacific.

Productivity per person is least in agriculture - \$2750 pesos per worker, and highest among electrical, gas and extractive industry workers - \$32,000 pesos per worker. These latter include only one percent of the total EAP, however (2, p. 131). As a likely counterpart to this productivity differential, there are truly exaggerated differences in per capita income by occupation. An estimate of 1960 annual wages follows (4, p. 113):

<u>Occupation</u>	<u>Annual Wage (\$ Pesos)</u>	<u>\$ U.S.</u>
Engineers, scientists	72,000	5760
Professional, technical	30,000	2400
Administrative, clerical	21,600	1728
Manual, sales outside agriculture	7,200	576
Unskilled agriculture	2,400	192

In fact, the total proportion of GDP derived from the rural sector has steadily diminished since the Revolution. Then it was 55 percent; by 1965, it was 31 percent, of which slightly over half stemmed from agricultural production. The rural share of GDP divided by the rural share of population shows a decline from 77 percent in 1910, to 65 percent in 1960, (3, pp. 72, 75), despite rural population share declining from 71 to 49 percent. As a result of this tendency, those states and areas with highest percentage of agricultural workers show lowest standards of living.

Paul L. Yates' welfare index, illustrated on Map 1, is outdated now, but changes since 1960 have not been significant enough to invalidate its relative measures. The index is based upon an average state score including factors of death rate, literacy, teacher-pupil ratio, percentage of dwellings with running water, the legal minimum wage, population covered by social security, registration per capita of motor vehicles, and per capita consumption of certain commodities.

Housing quality and education levels are probably the most significant welfare indicators outside of health, and national data are collected for these. While literacy rates have certainly improved this century, the schools have simply not kept pace with population growth. In 1970, literacy was recorded by the National Population Census at 62 percent, with a range among states of from 51 to 83 percent, this latter figure holding for Mexico City. Sixty-five percent of children ages six to nine have had

no primary schooling; roughly 20 percent of children ten to 19 have had none. Ninety-five percent of children ten to 14 have had no secondary schooling; 90 percent of those fifteen to nineteen.

Even by 1970, 40 percent of all Mexican homes had earthen floors. In 1960, 32 percent of all homes had running water, but the range was dramatic-- from 4.5 percent in Quintana Roo to 75 percent in Mexico City. Certainly, by 1970, this figure had improved. Nearly 50 percent of all homes in 1970, however, still had palm or uninsulated tile roofs.

With the steady rise of a middle class, there has been an expansion in the domestic market for goods and services, and particularly in the past ten years, there has been a move from production of luxury consumer goods and a general appeal to the high-income market, to a more mass-oriented appeal. Nevertheless, this important transition cannot be completed until incomes of the urban lower classes, and particularly of the markedly impoverished rural groups, are raised.

It is this latter group that most concerns us here -- for the real crux of the development problem in Mexico lies in the rural sector. The more difficult urban issues are involved with the absorption of a steady migration of unskilled workers from rural areas, primarily due to lack of opportunity in the countryside. It is now estimated that there are over three million landless laborers in rural Mexico, and these, along with grossly underproductive rural farmers who do have some land, are invading the cities in force. With advancing capital-intensive technology rapidly edging the unskilled workers -- urban and rural -- out of the labor market, some kind of crisis may be waiting around the corner.

The following chapter will discuss in greater detail the Mexican development strategy since the 1930's and the evolution of the dualism that led to today's dilemma. The place of the agricultural sector will be emphasized in an attempt to place in context the major problems and opportunities now facing the government should it try -- as it appears now in the 1970's to be trying -- to broaden the growth process to include the "other half." The Mexican national party is called the "Party of the Institutionalized Revolution (PRI)" -- and indeed, with the 1910 Revolution always in the background, and an increasingly politicized and interconnected citizenry, it may have no other choice than to live up to its name.

CHAPTER II

Mexican Development Strategy

A restrictive geographical setting and the political mandates of the 1910 Revolution have been the most significant "exogenous" determinants of Mexican development. Within these constraints, however, the Mexican political and planning system have exhibited great flexibility. They have managed to direct capital investment very effectively according to their plans, to control foreign influences and also those potentially disruptive forces within Mexican society. They have been less successful with economic programs directed at low-income producers, particularly in agriculture, but one suspects that this is mostly from lack of the concentrated effort and skilled manpower dedicated to other sectors. Below is a short review of geography and Revolutionary politics as background for those unfamiliar with Mexico, but our emphasis here is on policy and we refer the reader to the bibliography for more in-depth coverage of these topics.

Geographical Constraints on Development

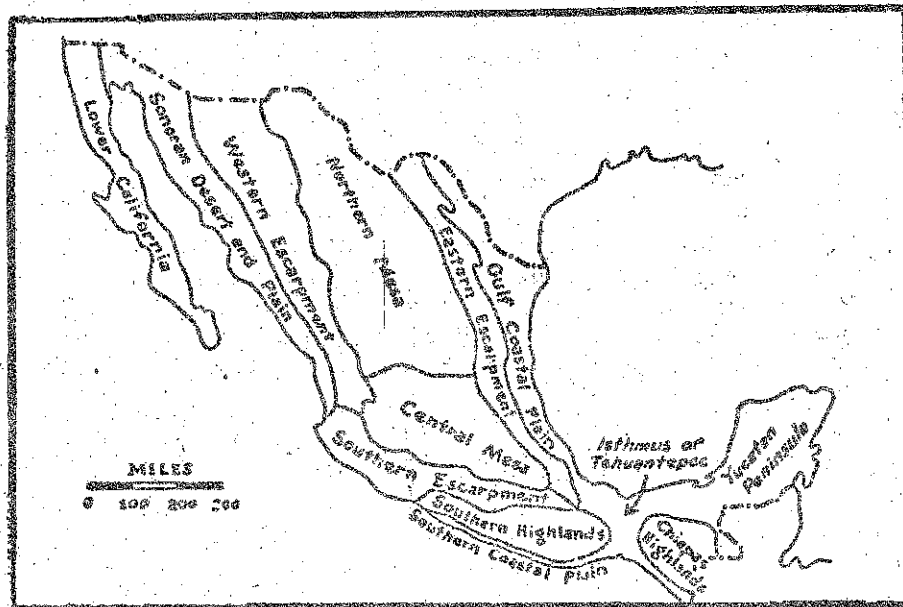
There is presently being collected in Mexico a new Natural Resources Inventory which will include extensive aerial photography. This is scheduled to be completed in 1976, and at that point a truly accurate picture of the resource potential -- both for agricultural and other purposes -- of Mexico should be available. We touch below on some of the more important aspects of Mexican geography as they relate to economic development of the country up until this time.

Mexico had a very turbulent geologic history with high volcanic activity and the folding of lands into very mountainous terrain. The Mexican mountain ranges (See Map 2) are an extension of the Cordilleran system of North America, which includes the Rocky Mountains. The two great mountain ranges to the north are the Sierra Madre Occidental and the Sierra Madre Oriental. Running parallel to the coasts, they separate the narrow coastal plains from the inland plateau. The Southern Escarpment further divides the country, leaving the Central and Northern Mesas -- together one third of the Mexican territory -- cut off effectively from the outer regions by high peaks and deep barrancas. This plateau is the third highest in the world. While the difficulty of transportation and communication across the mountains and the isolation of mountain inhabitants made Mexican political and economic integration difficult, it also made for less favorable agricultural conditions.

Erosion in Mexico is a severe problem. It is estimated that only ten percent of the land area is completely uneroded, and most of this is now under forest. Eighteen percent of the land has "limited erosion" (meaning up to 25 percent), and the remainder is at least one quarter eroded. A result of both climatic conditions and poor soil management, this problem has only recently become a policy issue (28, p. 2).

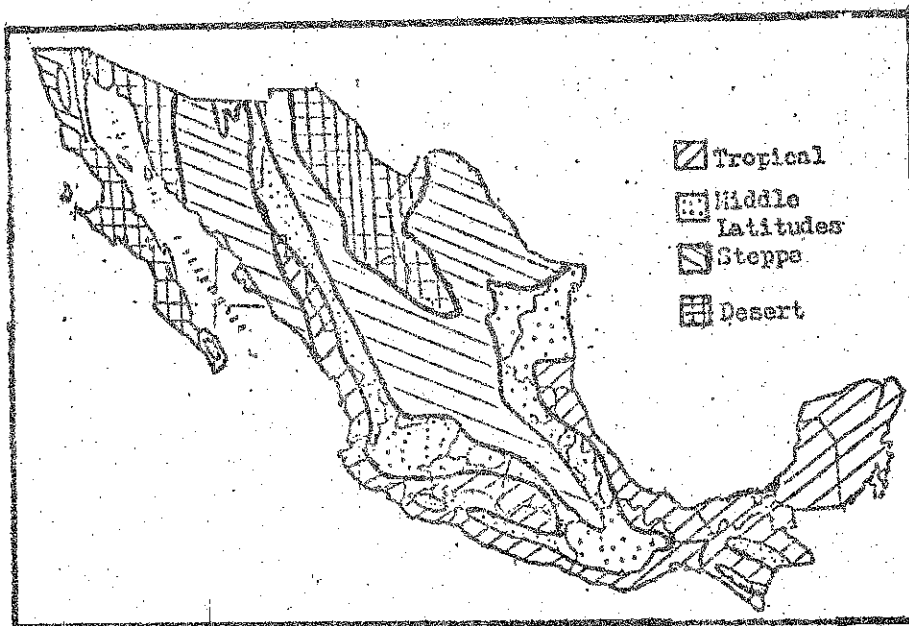
The slope problem itself is a severe deterrent to agricultural development. Half of Mexican land has a slope greater than ten percent; one quarter has slope greater than 25 percent. This means that with good conservation practices, 140 million hectares could conceivably be used as

Map 2. Principal Natural Regions*



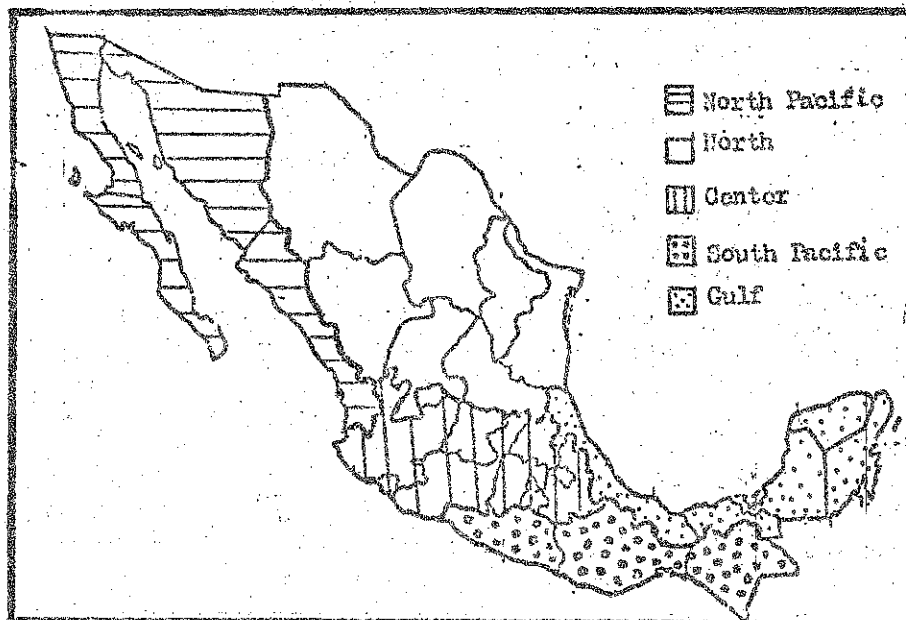
*Thomas T. Poleman, The Papaloapan Project: Agricultural Development in the Tropics (Stanford U. Press: Stanford, 1964), p.11.

Map 3. Climatic Divisions*



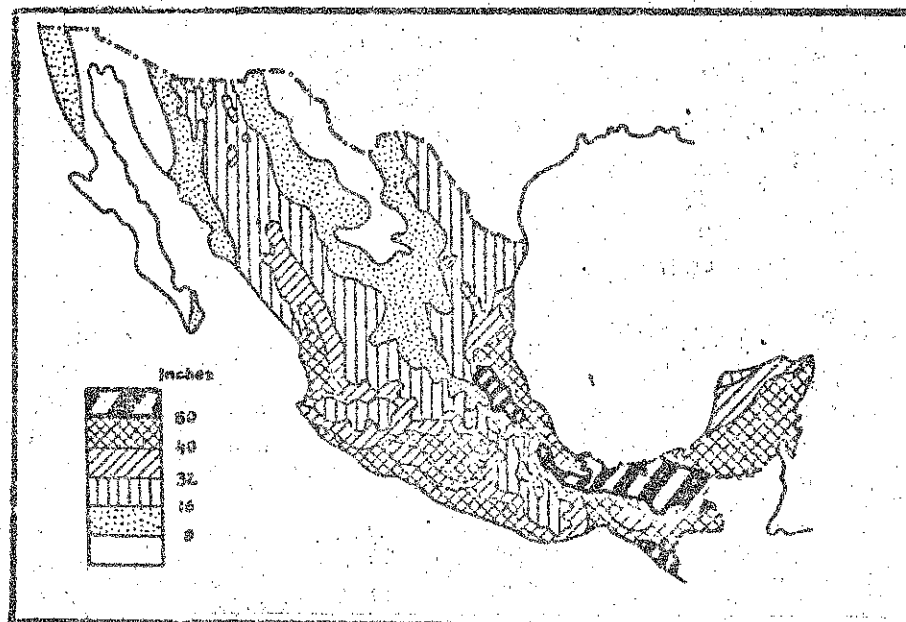
*Thomas T. Poleman, The Papaloapan Project: Agricultural Development in the Tropics, (Stanford U. Press: Stanford, 1964), p.70.

Map 4. Statistical Divisions*



*Thomas T. Poleman, The Papaloapan Project: Agricultural Development in the Tropics (Stanford U. Press: Stanford, 1964), p.24.

Map 5. Average Annual Rainfall*



* Michael K. Bonne, et.al, Atlas of Mexico (U. of Texas: Austin, 1970).

cropland -- having slope less than 25 percent, but this still precludes the use of much machinery on most mountainous land and makes marketing and physical access to inputs very expensive.

So important to Mexico is the effect of the mountains and high plateaus that the natives refer to climatic regions in terms of altitude. The tierra caliente -- "hot lands" -- generally refers to the humid tropical lowlands, where average summer temperature is over 100° F., but also may include the low desert lands. The tierra templada -- the "temperate lands" -- refers to areas 3-6,000 feet high with a generally mild climate and occasional light frosts. The tierra fria -- "cold lands" -- are above 6,000 feet in altitude and have frequent winter frosts.

The population early tended to concentrate in the Central Mesa, a temperate zone with ample rains, a long growing season, and mild summers and winters. In the tierra caliente, hard rains, heat, humidity and disease have historically reduced agricultural productivity and the initiative of the inhabitants. The southern Gulf plains have thin, lateritic soils over much of their area, and high winds which have removed valuable topsoils. Mountain climates are fairly inhospitable; the northern areas -- deserts for the most part -- cannot support any agriculture without irrigation. See Map 3 for a general picture of climatic zones.

The major geographical divisions help define the five principal statistical zones of Mexico which will be used in this study. They are: the Pacific North (Baja California Norte and Sur, Sonora, Sinaloa, Nayarit); the North (Chihuahua, Coahuila, Nuevo Leon, Tamaulipas, Durango, Zacatecas, San Luis Potosi); the Center (Aguascalientes, Mexico, Puebla, Jalisco, Michoacan, Queretaro, Hidalgo, Distrito Federal, Tlaxcala, Morelos); the Pacific South (Colima, Guerrero, Oaxaca, Chiapas); and the Gulf (Veracruz, Tabasco, Campeche, Yucatan, Quintana Roo). Map 4 shows these divisions.

The Tropic of Cancer roughly divides the country, which runs from 15 to 35 degrees north latitude, into its major climatic regions. North of this line is a sub-tropical, high-pressure zone with low rainfall. The cold currents of California, blown by the west winds, combine with cold water from Mexico's West Coast, to form the dry desert areas of the northwest with their strong temperate oscillations. Farther down the western coast, temperature rises and precipitation increases, resulting in the famous beaches of the Pacific coast.

Warm water and intense evaporation from the Atlantic Ocean are the principal agents for weather in eastern Mexico. The northeast trade winds carry some of this humidity southwest, but most is blocked by the Eastern Escarpment, such that only the Gulf region has a real abundance of rain.

All over Mexico, air movements over the mountains distort precipitation patterns further. Some parts of the southern Gulf receive more than 118 inches of rain per year. By contrast, in the north and northeast, some regions receive less than 7.5 inches per year.

Water, then, is the second major limiting factor in Mexican agricultural development. A recent study (1969) on Mexican water resources reveals that some 43 percent of all the land area in Mexico is arid; that is, agriculture is impossible without irrigation. Thirty-four percent is semi-arid,

where agriculture requires irrigation more than 50 percent of the time, due to either insufficient or poorly distributed rainfall. The semi-humid regions -- some 16 percent of land area -- can support agriculture without irrigation in more than 50 percent of all years. In humid zones -- 7 percent of the land area -- rainfall is adequate to satisfy the needs of at least one crop per year, though irrigation may still be recommended for multiple-cropping. See Map 5 for rainfall patterns in Mexico (26, p. 99).

Even these rather pessimistic numbers underestimate the problem. The southern 12 percent of Mexican territory receives 62 percent of the country's drainage waters. The Papaloapan, Coatzacoalas, Grijalva and Usumacinta river basins -- only ten percent of Mexican territory -- have nearly half the water. In much of this land, there are severe problems of excess water with flooding, swamps, and restricted drainage. There is great potential for irrigation in many areas, due to underground water resources and the prospects of transporting water from heavy rainfall areas, but irrigation requires high value crop production to be economically viable.

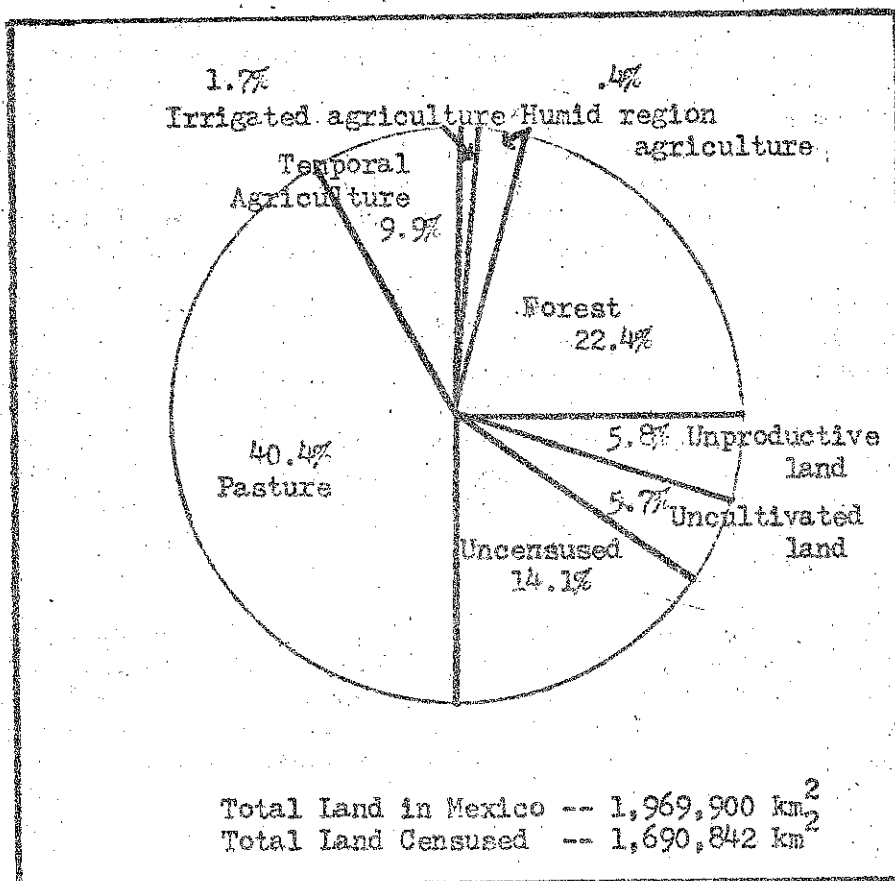
Soil fertility is quite variable, highest in areas of boreal forest and lowest in desert areas. Tropical soil management is still not well enough developed for intensive exploitation, but of tropical soils, the savannas seem to have the highest potential. Unfortunately, native soil fertility has not been well-managed in most of Mexico. A majority of lands now described as "fallow" in fact have been abandoned due to low soil fertility (1, p. 241). It is estimated that some ten million hectares of land are now not receiving adequate nutrients to maintain -- much less improve -- the land's productivity.

Of 169 million hectares censused in 1969, only 14 percent was put to agricultural production. See Graph 4. Almost all that is temporal. Nearly half of censused land was pastureland, but probably only a small part is really so utilized, as livestock production still seems to be growing fairly slowly in Mexico. There is much uncultivated productive land still left -- by Census definition -- but one suspects that with so many landless workers in Mexico, this would have been settled already had conditions been adequate.

Mexico was liberally blessed with mineral resources, on the other hand, that have been a real asset to industrial development. We do not as yet know the full extent of mineral stocks, but they are significant. Mexico was first conquered for her riches of gold and silver, and for several centuries, mining was the only major economic investment made in the country. However, what were at first highly productive mines became obsolescent quickly, until by the middle of the 19th century, mining techniques in Mexico were some of the most backward in the world, and her income from this source was declining.

In today's world, however, Mexico's other diverse resources are proving to be worthy successors. Crude oil reserves were estimated in 1969 to be 2.7 billion barrels (.6 percent of world reserves). Natural gas was estimated at 13 trillion cubic feet (.8 percent of world reserves). Major present and potential future production sites are primarily along the eastern coast (3, pp. 105-7).

Graph 4. Land Use in Mexico - 1960*



* Data from 1960 Census, reported by Maffuel Aguilera Gómez, La Reforma Agraria en el Desarrollo Económico de México (Instituto Mexicano de Investigaciones Económicas: Mexico, 1969), p.237.

Major ferrous minerals mining is done in Chihuahua, Durango, Hidalgo, Coahuila and Zacatecas. The total national value for production of these in 1965 was \$97,061,000 pesos. Non-ferrous mining is found in Chihuahua, Nuevo Leon, San Luis Potosi, Zacatecas, Sonora, and Hidalgo, each of which earns over \$200,000,000 pesos from these resources. Total national production was valued in 1965 at \$3,510,782,000 pesos. There is significant mining all over Mexico in ferroalloy, base and precious minerals (3, pp. 110-11).

Political History of Mexico Through the Revolution

In order to put into perspective the development course taken after the Revolution of 1910, it is important to understand the forces -- still alive in Mexico -- which led to this long and bloody war. In a nutshell, a two-edged sword was responsible: the political frustrations of the educated classes against a rigid power structure, and the economic frustrations of a peasant class which was thoroughly exploited by those in power.

3/

Both these themes run back as far as the era of the conquistadores when a predominantly feudal land tenure was developed and all political power ran back to the King in Spain. The Spanish conquistadores were rewarded for their valor in conquering the Mexican territory with extensive landholdings called haciendas, often greater than one thousand hectares. These were prized primarily for the prestige associated with them, rather than economic production. There also existed small subsistence ranchos, but these were inconsequential to the national economy. The Indian villages were collectively organized to include private plots, as well as large communal plots for grazing, woodland products and to support spiritual or political leaders. As haciendas began to usurp village lands, these Indians were turned into peons, particularly in the northern regions, through a system of debts which were passed on for generations. Those Indians who fought for their land rights were frequently enslaved and sent to the Yucatan peninsula for plantation work.

The Catholic Church became a dominant land-holder, and controller of what capital was allowed to accumulate in the New World. For the most part, capital accumulation was forbidden to the colonies, which were viewed only as sources of raw materials for the mother country.

By the nineteenth century, the rule of Spanish aristocracy had become repugnant to Mexican-born Spaniards, who held an inferior place on the social ladder. The campesinos (peasants) joined forces with them out of anger over land usurpation, and the War of Independence began in 1810. In 1814, the Congress of Apatzingan convened to discuss radical land reform, under the leadership of Jose Maria Morelos; he was later shot, and these initial attempts to break up the feudal system were smothered by the new elite in power. What began as a social uprising against the feudal system, ended up as a mere coup replacing Mexican-born aristocracy for the Spanish-born.

3/ Several Spanish terms will be used so commonly in this paper that they will be underlined only when introduced.

Some agrarian reform was legislated, and colonization programs were begun, but the net result of these was to free land that again ended up in the hands of the wealthy. The Church was a powerful force against reform. Its power was not diminished even after the Three Year War in 1857, when under Benito Juarez, liberal Lay forces defeated conservative groups backing the Clergy. When Church lands were finally broken up, they also tended to end up in the hands of the hacendados.

In 1865, Maximilian was sent from France to rule over Mexico. He tried to enact some reforms, but when Napoleon removed French troops from the country, local political struggles led to his assassination. Juarez took the Presidency in 1867, and held the country together for a while through the force of his personal character and prestige. His successors, however, were unable to keep the peace, and turbulence arose once again.

In 1877, Porfirio Diaz gained control of the situation, and became President, a term which was to last almost continuously until 1910. He managed to dominate the various opposing factions in the country, essentially by playing them off against one another. He encouraged economic growth through commercial agriculture, large foreign investment, export diversity and new manufacturing, but these affected a very minor portion of the Mexican population. He gave away some twenty percent of the country's land area, primarily to land companies (often foreign) who maintained tracts of millions of acres. Hacendados, worried about encroachment from the land companies, tried to enlarge their own holdings. Indian lands were expropriated without hesitation by all parties, such that by 1910, 90 percent of all Indian villages held no communal land, and 97 percent of all rural family heads were without land (1, p. 82). Sixty-three percent of the total population of Mexico (88 percent of the rural EAP) were peons (1, p. 92). This peonage problem was concentrated in the north, the deprivation of villages lands in the south.

During the Porfiriato, wages declined some 46 percent, while prices increased 179 percent. Furthermore, in the last years of the Porfiriato, industrial employment began to decline with increased mechanization, the decline in export demand and the depreciation of silver, upon which the Mexican economy was based (1, p. 89).

The non-military groups of the urban areas were becoming dissatisfied with the lack of opportunity for mobility within the dictator's government. The intelligentsia grew belligerent toward the political concept of perpetual re-election. The groups gathered forces, then, in 1910 to begin a bloody revolution that would officially last until 1921, with sporadic fighting for years after.

One after the other of the 'Revolutionary presidents' -- Francisco Madero, Venustiano Carranza, Adolfo de la Huerta, Alvaro Obregon, attempted to pull the country together and nearly all were assassinated, exiled or overthrown. At first, consistent with upper-class liberal politics, the Presidents deemed political emancipation the important mandate of the Revolution. Soon, however, it became apparent that the major question was over land reform. Some opted for colonization and the buying up of private land for redistribution. Others wanted fiscal measures used to fraction the large holdings. Others felt there was a moral mandate in just taking over the lands which had been "unjustifiably stolen." Still others wanted to socialize all rural property. Continuing violence required that something concrete be done.

The Constitution of 1917 includes variations on all these themes. The ejido program was designed, although this was to fall in and out of favor continuously during the next few decades. Small private property was to be protected, large holdings broken up. Peasants invaded lands, and little real retribution was offered to large landholders. At the time of its writing, the Mexican Constitution was probably the most radical national document in the world -- it included labor protection laws, business socialization procedures, full protection of numerous rights, and a tacit recognition throughout of the social function of the land.

Unfortunately, as things quieted down, agrarian reform lost its impetus. An influenza epidemic, drought, the world business depression, and church versus state antagonisms got in the way. The idea took hold that the traditional economic sectors should be encouraged and left free to develop so that resources could accumulate that would later be used to finance expansion and social equity plans.

The political powers in Mexico have held the country together with remarkable success and comparatively minimal bloodshed for the past forty-five years. But has the Revolution been completed? Many observers of the Mexican scene are answering "no." With the above history in mind, we reflect that a new turning point in strategy may be both in order and in process.

Post-Revolution Development Strategy - Dualism

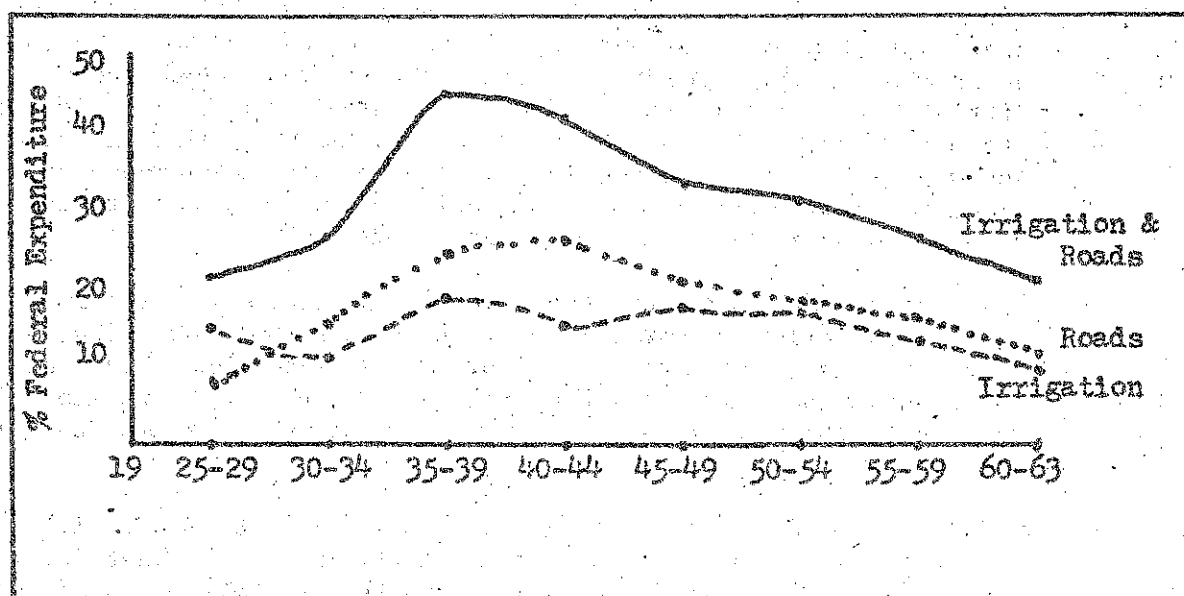
Private capital and investment decisions have played an important role in Mexican economic development, but the policies of the government have played the major part in determining the direction of the economy. Through constraints and incentives in government tax policy, foreign trade, infrastructure construction and maintenance, education of the labor force, and business and agricultural laws, the various sectors have received their base for development. Table 1 illustrates the patterns of government spending since 1930. Industrial emphasis has been at the forefront, commercial agriculture somewhat less so but still significant. Expenditures for "welfare" have been minimal by comparison. Infrastructure has been far and away the most important element in government spending. Roads and irrigation make up an enormous part, particularly in the years from 1940 to 1960. See Graph 5.

The rest of this chapter will analyze the major aspects of industrial policy, and the dual agricultural approach - its success with commercial agriculture, and its failure to deal with the larger masses of low-income farmers. Comments on welfare expenditure and political mobilization will follow.

Industrial policy

Clearly, the major goal of the Mexican government during the past few decades has been to create a modern industrial base for the country. Beginning with the Presidents under the influence of Plutarco Elias Calles-- Calles himself (1924-29), Emilio Portes Gil, Pascual Ortiz Rubio and Abelardo Rodriguez -- incentives for manufacturing and heavy industry were provided, and the industrial labor force was heavily repressed for

Graph 5. Federal Investment in Irrigation and Roads*



* Clark Reynolds, The Mexican Economy (Yale University Press: New Haven, 1970), p.291.

Table 1. Functional Distribution of Federal Expenditure 1940-1963*
(In percent, unless otherwise specified)

	1940	1945	1950	1955	1960	1963
Total expenditure (million pesos)	551.9	1320.6	2795.9	6509.5	11927.8	16806.7
Communications and Transportation	16.6	18.6	25.7	25.5	21.0	19.2
Agriculture	12.9	18.0	12.5	15.0	10.8	11.7
Industry and Commerce	4.4	4.0	18.0	13.6	13.3	10.5
Education and Culture	13.5	13.0	11.1	11.9	16.5	20.4
Hospitals and Health	7.1	7.3	4.6	4.5	5.3	5.1
Welfare and Social Security	3.0	2.5	3.8	4.1	6.2	8.6
Military	20.7	15.6	10.9	8.2	9.3	9.1
General Administration	16.1	15.6	9.1	12.6	12.6	11.3
Public Debt	5.7	5.4	4.3	3.4	4.9	4.0
Other	-	-	-	1.2	.1	-

* Clark Reynolds, The Mexican Economy (Yale University Press: New Haven, 1970), p.291.

the benefit of the new entrepreneurs. While Lazaro Cardenas (1934-40) re-emphasized the importance of the agricultural sector and focused much attention on land reform, he continued a pro-industrial policy. His major legacy to the industrial structure was nationalization of several foreign enterprises.

Manuel Avila Camacho (1940-46) passed the law requiring 51 percent Mexican ownership of all enterprises, which increased greatly the power of the small segment of Mexican entrepreneurs. From this time on, a sort of "alliance for profits" emerged between the technocrats of the government and the business community, particularly the "New Group" -- those industrialists who got their initial spurt from World War II and had been financed purely by Mexican capital (11; 20, p. 187). High import duties were placed on consumer goods, while capital goods were usually subsidized by the government. This policy, made possible by strong government control of unions, led to (premature) preference for capital-intensive production processes, despite the massive pool of labor migrating to the urban areas and very low wages.

Miguel Aleman (1947-52), responsible for the regional development policy for outlying areas and for large investments in irrigation, was a major participant in the strengthening of this business-government alliance. Campesino and labor groups highly controlled by government-chosen leaders, and the military, now quite weak, had made up the national Mexican political party. Aleman reorganized this into the Partido de la Revolucion Institucionalizada (PRI), excluded the military and included instead a popular sector, recognizing the growing political importance of the educated middle-class and bureaucratic groups. While the party effectively maintained the political stability of the country -- controlling those groups which might well disapprove of the development strategies being chosen -- most important decisions were made within the "alliance." The Confederation of Chambers of Mexican Industry and the Confederation of National Chambers of Commerce were particularly influential groups (20, p. 187).

Adolfo Ruiz Cortines (1953-58) concentrated on "bottleneck-breaking," primarily by increasing electricity and oil refineries, and with increased government spending on industry. The capital stock of the country which had doubled in the 1940's, doubled again in the 1950's (20, p. 185). Foreign investment was encouraged. United States direct investment in Mexican manufacturing alone increased from \$133 to \$355 million -- two thirds of its total investment there (20, p. 190).

Throughout the decades after the Revolution the government financed nearly three fourths of its total spendings through its own savings, borrowed little abroad and had only minimal taxation. What taxes existed were indirect goods taxes; most were regressive. A steady ten percent per year inflation and an unusual system of national banking were utilized to finance expenditures instead. During the presidency of Ruiz Cortines, however, a political crisis developed as this inflation suddenly hit thirty percent per year. The major cause for this was the devaluation of the peso -- once in 1949, and again in 1954. There was such political disruption from this that patterns of government finances were forced to change. Since 1955, inflation remained at less than three percent per

year until the 1970's. Foreign borrowing was increased (Mexico has an excellent credit rating) and in the early 1960's personal income and corporate taxation was initiated under President Adolfo Lopez Mateos (1959-64). This was one sign of a partial break in the powerful hold of the elite business community in Mexico. Still, by the mid-1960's, taxation amounted to only 14 percent of national income, and there was significant tax avoidance.

In the late 1960's, under the presidency of Gustavo Diaz Ordaz (1965-70), taxation of corporations and personal income grew to provide almost half of government finances. Foreign trading laws were liberalized and industries were warned to become more efficient and offer lower prices, or domestic protection would be withheld. It had been shown that most of the increase in manufacturing output was due entirely to inputs, with productivity increasing only slightly. Industry had become quite concentrated, as was mentioned before. Perhaps this was a practical move, due to the relative scarcity of skilled managerial and other personnel, nearness to markets and government agencies, and subsidized urban services.^{4/} Nevertheless, severe traffic, water shortages, unemployment, congestion, pollution, waste disposal and numerous other problems associated with megalopolis are also evident here, not to mention the adverse effects to development of outlying areas caused by the social/cultural emphasis on the central city exclusively. There are few incentives devised by the government for industry to decentralize.

There is some evidence that Luis Echeverria Alvarez, who became President in 1971, has transferred some resources to the outlying areas, although it is too early yet to tell the long-term effects of these policies. Significant tax increases for the urban middle classes, hikes in gasoline and other commodity prices, Echeverria publicly attributes to the need for funds for rural development (as well as independence from foreign creditors).

Increased industrial growth is necessary to satisfy the growing demands of the masses; that is not the controversy. What does require concentrated political and economic effort is the integration of industrial development with mass participation in some manner.

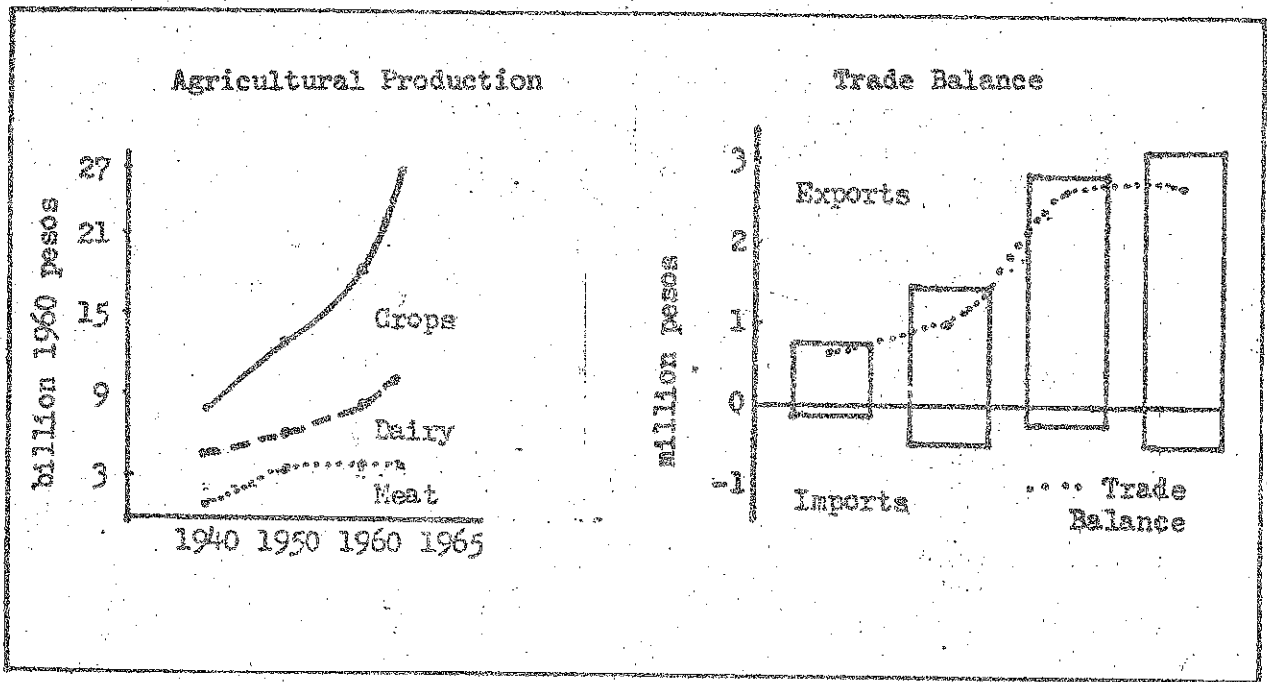
Development of modern agriculture

Agricultural production since 1940 has more than tripled (see Graph 6) with crops production quadrupling and meat and dairy production doubling. The overwhelming proportion of this increase was in export agriculture and, less so, new introduced crops such as alfalfa, oats, sesame and wheat. Subsistence and traditional agriculture only doubled during this period. This resulted from a government policy clearly favoring the "nylon agriculturalists" that is, the city businessmen who were financing commercial farm production.

The agricultural trade balance of Mexico increased six times between 1950 and 1965 -- the balance of crops nine times, meat twice. Export crops have diversified greatly, allowing Mexico a more stable foreign exchange

^{4/} Mexico City in the late 1960's was subsidized in transportation, natural gas, wheat, corn, low grade gas and diesel and electricity (20, p. 172). Note, however, that the city does provide more taxes than the government spends on it.

Graphs 6 and 7. Mexican Agricultural Production and Trade Balance*



* Reed Hertford, Sources of Change in Mexican Agricultural Production 1940-65, (Diss. University of Chicago, March 1970), pp.11,16.

income than earlier (see Graph 7). Even in 1961, cotton provided one third of all exports. By 1973, cotton, coffee, cattle, tomatoes and sugar all provided between ten and 17 percent of export earnings. Other important commodities were shrimp, melons, tobacco, tar pith and hog products. Agricultural imports were quite minor until the 1970's, except for large imports (over \$100 million pesos) of maize in 1963. In 1970, over 100 million pesos was again spent on maize, and also a large amount of condensed milk. In 1972, over \$100 million pesos was spent on wheat; in 1973, on wheat and sorghum (31, pp. 137-144).

Leading products for domestic consumption - which total in 1968 some \$58,506 million pesos in the commercial market - by value are meat and milk products (nearly \$14 billion pesos), then cereals (nearly \$11.6 billion pesos), then poultry, fruits, pork, sheep, starches and honey products. By quantity, consumption ranks cereals high above all else -- some 165 kilograms per capita per year, with corn predominant in the rural areas, substituted somewhat by wheat in urban areas. Next highest consumption is for sugar, then beef (16 kilograms per capita), then beans (21, p. 458).

In 1970, the largest agricultural producers were Sonora (\$3.7 billion pesos), Veracruz (\$3.7 b. pesos), Chihuahua (\$2.6 b. pesos), Jalisco (\$2.5 b. pesos) and Sinaloa (\$2.3 b. pesos). Next were Baja California Norte, Coahuila, Tamaulipas - none of which receives more than fifteen percent of its income from agriculture -- Michoacan, Chiapas and Guerrero (31, p. 207). See Maps 6 and 7 for the major agricultural areas and the regions for production of specific crops. Veracruz is the leading state for livestock production, followed by most of the northern states, which have extensive dryland ranges, and the central states of Michoacan, Jalisco, Tabasco and Zacatecas.

Maize was the leading crop in Mexico from 1970 to 1973, averaging over \$8 billion pesos annually in value. Cotton and sugar cane followed, averaging \$2.7 billion pesos each. Sorghum, beans and coffee were valued around \$1.6 billion pesos; wheat, alfalfa and tomatoes around \$1.3 billion. Leading crops on a national basis were maize, sorghum and beans; in irrigated areas cotton, wheat, maize, safflower, soy and sorghum are all important (31, pp. 216-248).

Agricultural productivity increases have been quite slow, and its level is much lower than other sectors -- presently only around one third that of manufacturing (See Graph 8). Only about a third of growth is due to increases in productivity; the rest comes from input use. Increase in land used for cropping has been the most important factor, accounting for 54 percent of agricultural production increase; changes in land use to more productive or valuable crops account for 11 percent of growth (20, p. 68). Capital per man between 1940 and 1960 went from \$3622 pesos to \$6064. Purchases inputs rose from an index of 18 in 1940 to 143 in 1965 (with 1960=100), primarily for chemical fertilizers, then seed, then insecticides and irrigation (12, p. 20).

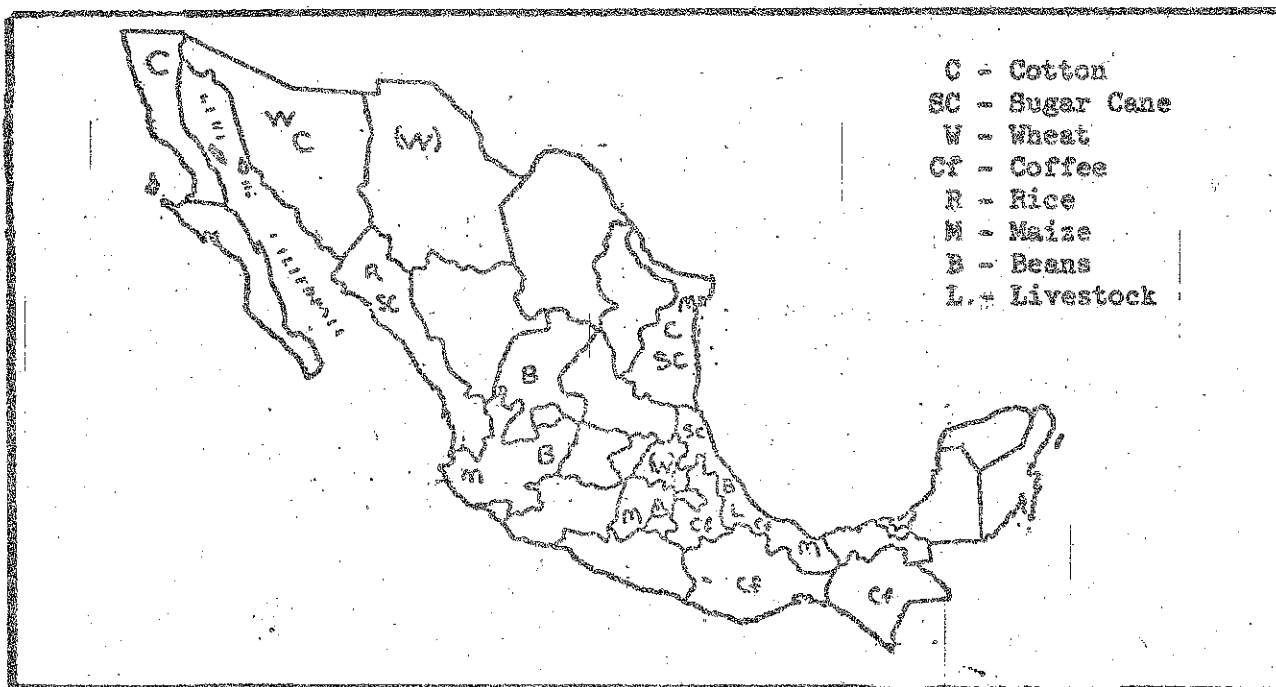
In 1950, only five percent of the land used chemical fertilizers; by 1974, 42 percent did. 100 percent improved seeds are used in cotton, soy and sorghum; over 50 percent in safflower, rice and alfalfa; between 25 and 50 percent of land in onions, wheat, tomatoes, potatoes and melon. In 1960 there were almost 55,000 tractors in the country, 5,000 motor shellers, and 9,000 mechanical threshers. There were, however, almost as

Map 6. Major Agricultural Areas, Mexico



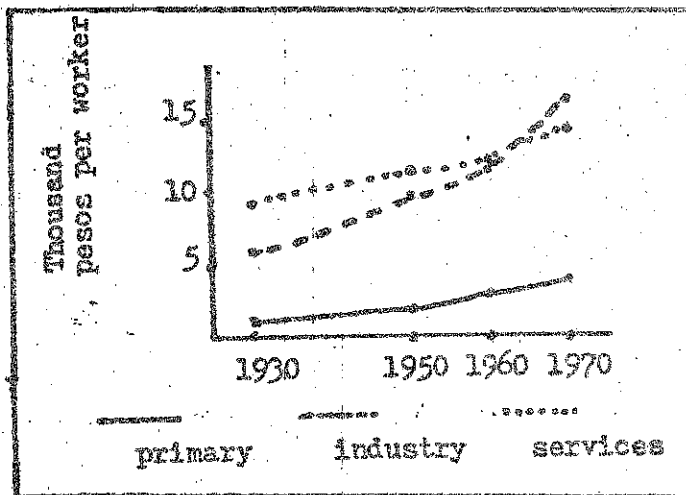
*Eduardo L. Verezien and William K. Gamble,
The Agricultural Development of Mexico, 1969.

Map 7. Major Crops, Mexico



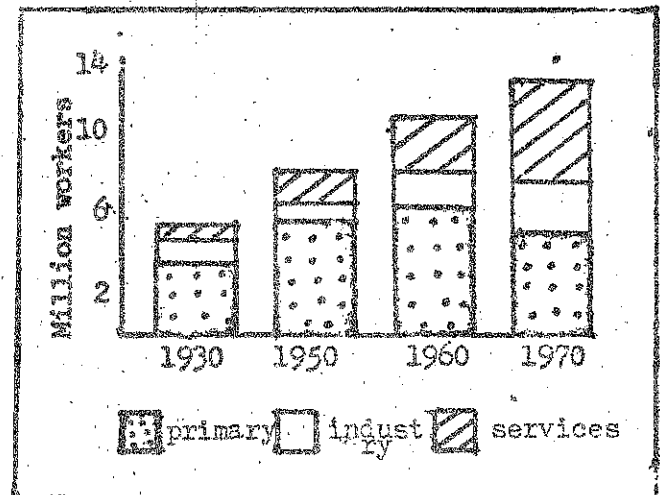
*Michael E. Bonne, et.al., Atlas of Mexico(U. of
Texas: Austin, 1970).

Graph 8. Sector Productivity 1930-1970*



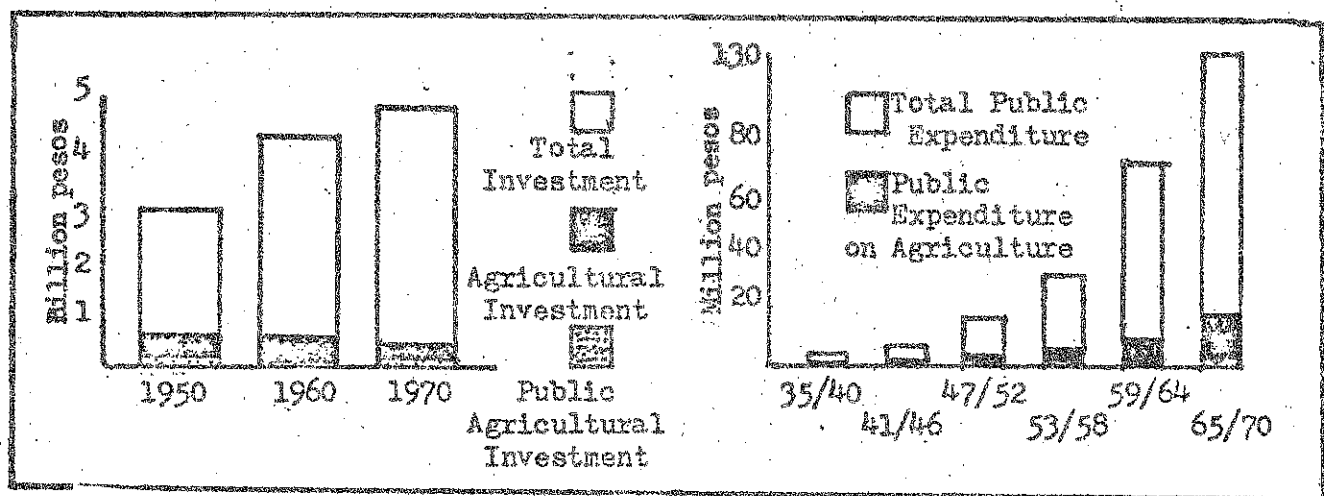
* Secretaría de Recursos Hidráulicos, Prontuario Estadístico de la SRH, 1974, p.121.

Graph 9. Economically Active Population (EAP)*



* Secretaría de Recursos Hidráulicos, Prontuario Estadístico de la SRH, 1974, p.121.

Graph 10. Investment and Public Expenditure on Agriculture*



* Investment data from: Manuel Aguilera Gómez, La Reforma Agraria en el Desarrollo Económico de México (Instituto de Investigaciones Económicas: México, 1969), p.264.

Expenditure data from: Departamento de Asuntos Agrarios y Colonización, Memoria de Labores del 1 de sept., 1968 al 31 de ago., 1969.

many old-type plows in the country (1,099,961) as there were iron plows (1,236,399), which suggests that the distribution of mechanized equipment is rather skewed. Irrigation in 1950 covered 13 percent of the cultivated area; by 1970, 20 percent was irrigated (31, pp. 210, 304; 12, p. 20).

Despite these tremendous advances in agriculture, the economy as a whole is moving away from this sector as an important source of national income and employment. As Graph 1 showed, agriculture's share in GDP has fallen by much more than her share of the economically active population, changes in which are illustrated in Graph 9. Agriculture still accounts for nearly half of the EAP in Mexico.

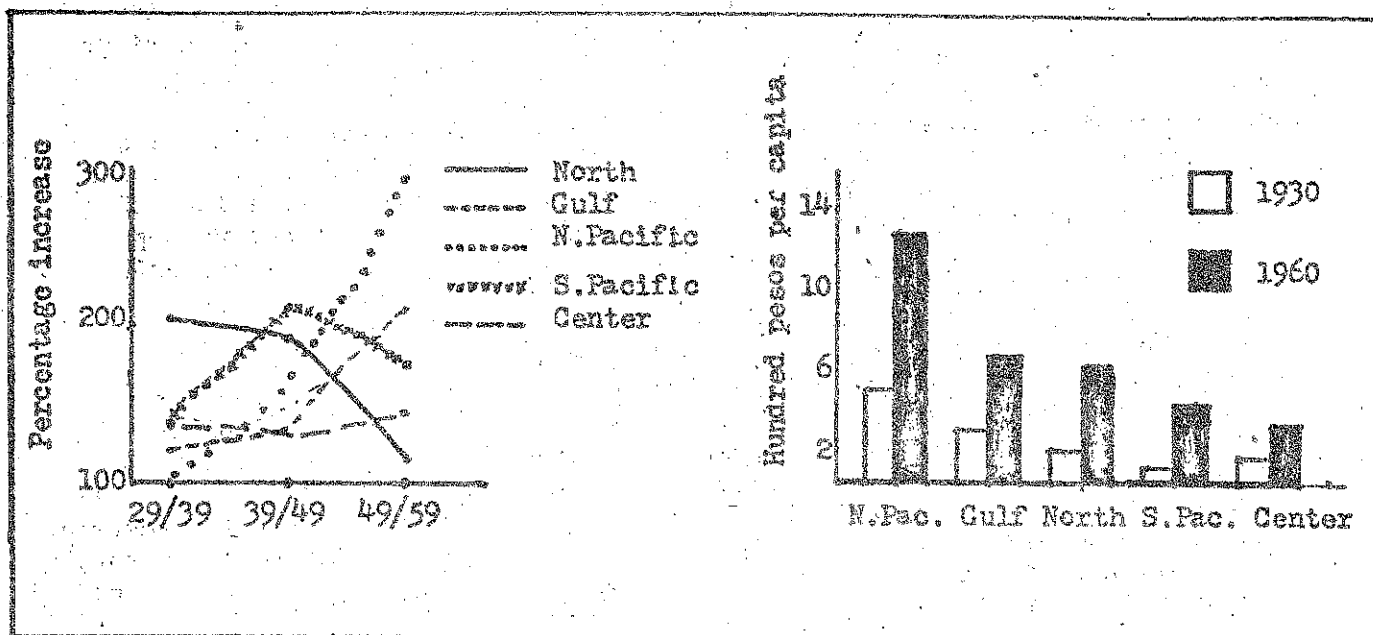
Total investment in agriculture (see Graph 10), has fallen as a portion of total investment, and absolutely. In 1950, 21 percent of total national investment - \$3037 million pesos - went to agriculture; 45 percent of public sector investment. In 1960, 14 percent of total national investment was in agriculture (\$4,296 million pesos) and only 12 percent of public investment. In 1967, agriculture in the total investment scene continued to be low - only \$4,803 million pesos - 9 percent of total investment. But the government's role in this now amounted to one third of total public investment.

A picture emerges of major inputs and investments in agriculture directed primarily to reach two goals: self-sufficiency of effective domestic food demand -- which was achieved until the 1970's, and an export surplus to finance capital imports for industry. A beneficial side effect is that although public expenditure on agriculture has been greater than the corresponding tax revenues, it was far less than the total transfer of accumulated savings from agriculture to industry (11). Furthermore, the return on government agricultural investments has been very good -- 9 percent of expenditures resulting in 16 percent of GNP (1, p. 266). Relatively cheap food for the urban population that resulted from stimulation of the commercial sector supplying the cities has reduced the costs of urbanization and industrialization in general.

The fulfillment of the above goals required only that a strong modern agricultural sector be created that could compete effectively on the world market, and have full access to inputs and an efficient marketing system. Investment, therefore, was quite concentrated, primarily in small regions in the North, North Pacific and the Gulf Coast. As shown in Graph 11, major production increases in the 1930's took place in the North; in the 1940's in the South Pacific and in the 1950's, the North Pacific and the Gulf.

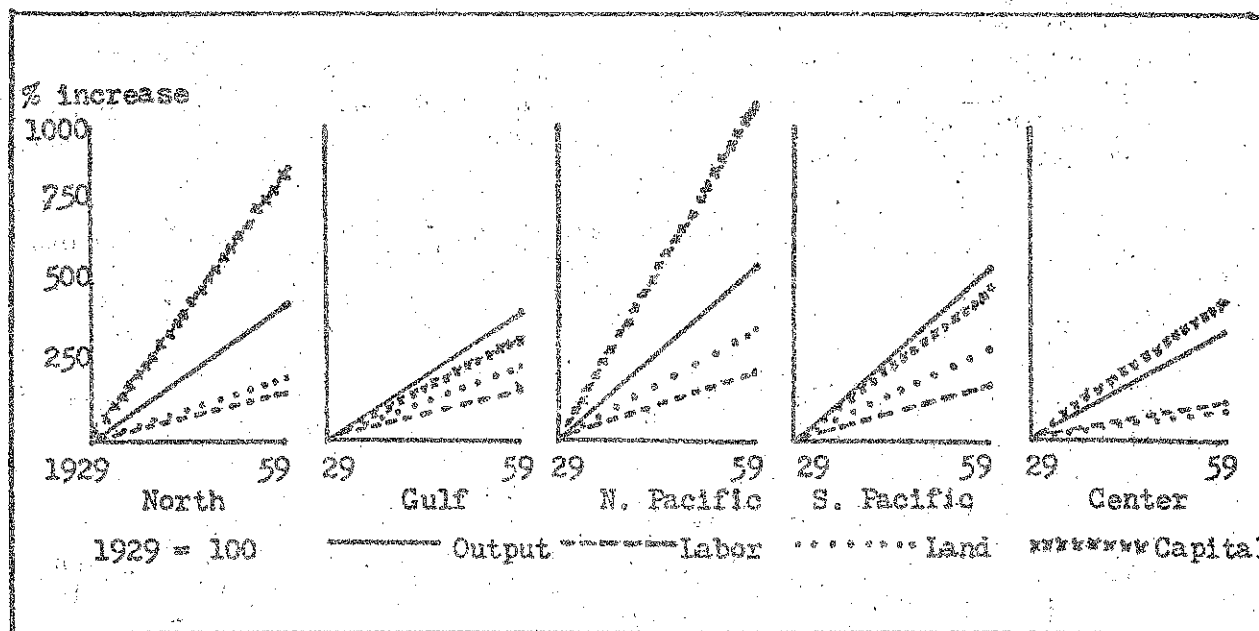
This relates to rate of growth, not total production or income. Note that regional per capita agricultural production in the North Pacific has consistently been ahead of the others, and that the income differential between the Center and the North Pacific is three and one half times. The Center in 1960 had a lower per capita production than did the North Pacific in 1930. Northern agriculture particularly is controlled by the "nylon agriculturalists," many of whom were friends of government politicians who learned privately of irrigation plans, for example, and bought up land before its value was generally recognized. Much of the northern lands are actually owned by prominent government leaders (11).

Graph 11. Regional Growth in Agricultural Production and Per Capita Value *



*Clark Reynolds, The Mexican Economy (Yale U. Press: New Haven, 1970), pp.103,98.

Graph 12. Factor Productivity by Region 1929-59 *



*Clark Reynolds, The Mexican Economy (Yale U. Press: New Haven, 1970), p.116.

In general, cotton and oilseeds production have been growing at the fastest rates, and these are primarily produced under modern conditions. It is interesting that the major factor in increasing production of these-- and in fact, all crops and forages -- is the increase in land cultivated of that crop; yields have been the least significant factor (1, p. 264). Graph 12 shows comparative productive factors among the regions from 1929 to 1959. Of a total output quadrupling, labor less than doubled; land use just doubled; and capital increased six times. Highest capital intensity is found in the North and North Pacific, least in the Gulf. Labor force increases were most in the North Pacific, least in the Center. Land expansion was greatest in the North and South Pacific -- via the extension of irrigation in the desert and the "March to the Sea" projects.

During the major irrigation push of the 1940's, the North and North Pacific received 81 percent of new irrigation and 50 percent of new roads. Even in 1960, these states were receiving 76 percent of new irrigation and 52 percent of new highways (20, p. 157). Increases in the lowlands region were particularly uneven, with most benefits going to very few landholders. Meanwhile, in the Center, 70 percent of all plots are now less than one hectare in size, which truly limits their commercial viability (1, p. 276).

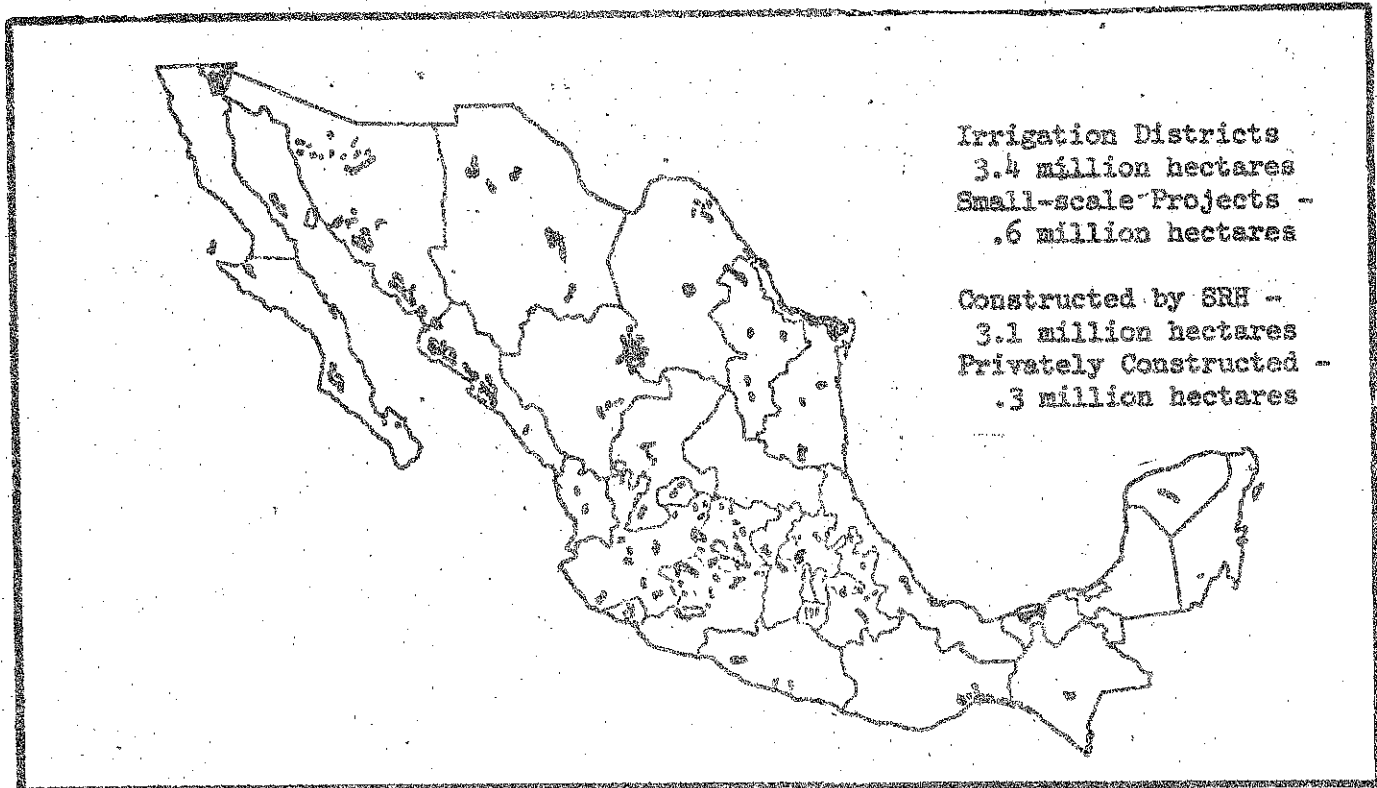
Since 1940, land concentration in Mexico has worsened. The Gini coefficient for land concentration in 1940 was .464; by 1960 it was .523. The private sector has experienced very little improvement -- moving from a Gini coefficient in 1940 of .75 to .73 in 1960 (see Appendix A for Lorenz curves) (26, p. 59; 12, p. 39).

Most capital improvements have been highly correlated with irrigation, which requires high-value yields to pay for itself, and the combination of available credit with a minimum level of initial investment capital. See Map 8 for irrigation locations in 1957. Although only 20 percent of the cultivated land is irrigated, more than 40 percent of the national value for wheat, cotton, safflower, sorghum, alfalfa, rice, tomatoes, soybeans and melon are produced on irrigated lands. There are significant yield differences (greater than 50 percent) only in maize, beans, rice, garbanzo and green chiles; but, with the exception of maize, these are little cultivated -- as they do not command a high price in the marketplace. As the percentage of total agricultural value of crops in the irrigated lands is higher than the percentage of total volume for most crops cultivated, the irrigated areas must either produce a higher quality product, or have better access to better markets (31, pp. 217-47).

It is of note that one percent of the users of irrigation with more than 50 hectares own 20 percent of the irrigated lands (31, p. 260). Although land concentration in irrigated areas is statistically more equal (lower Gini coefficient) than that of total land, the extra equality is generated at the lower end of the scale. More small farmers own more land, but so also do more larger farmers.

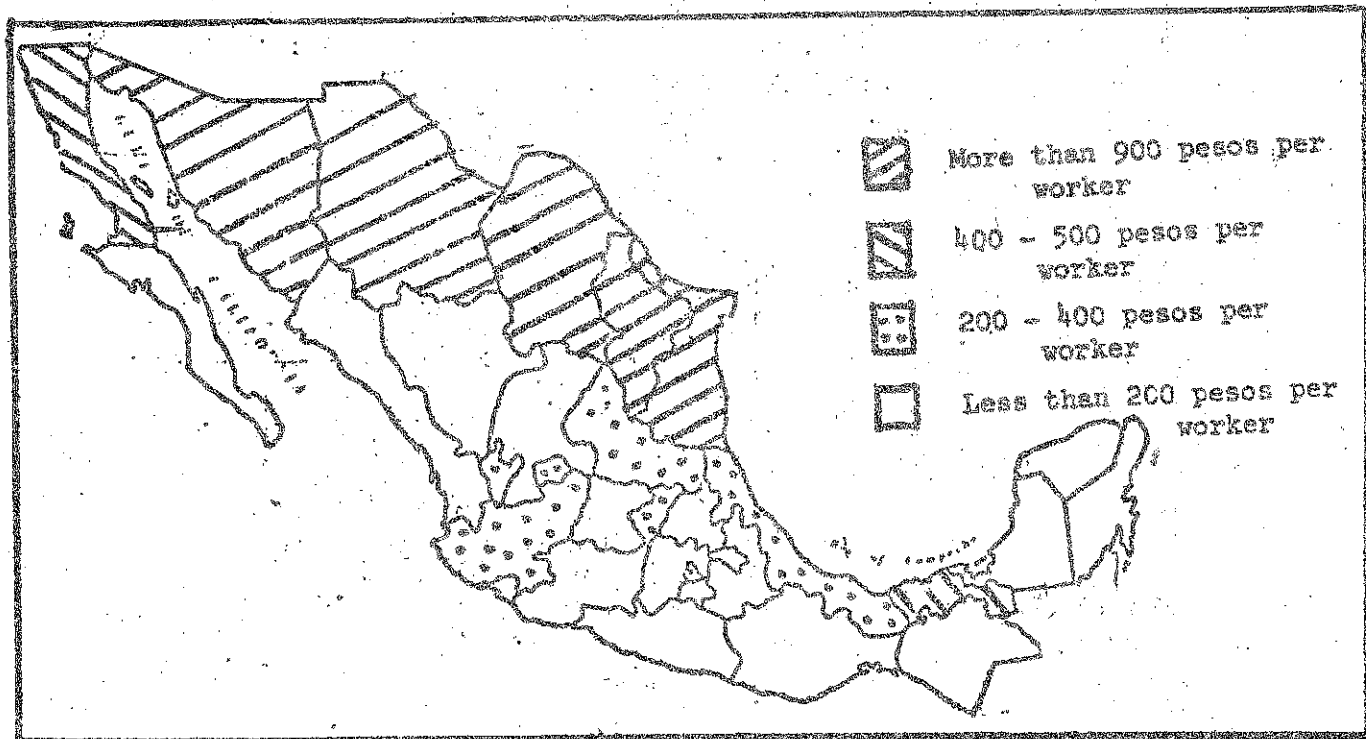
Fertilizer use is highly correlated with irrigation. In 1974, 42 percent of total cultivated land was fertilized; in 1971, 78 percent of irrigated lands were fertilized. Fifty-five percent of irrigated lands are completely mechanized (31, p. 292, 304).

Map 8. Irrigated Areas 1974*



* Secretaría de Recursos Hidráulicos, Dir. de Información y Divulgación, Dept. de Estadística, El Riego en México, October 1974.

Map 9. Agricultural Credit 1970*



* Secretaría de Recursos Hidráulicos, Prontuario Estadístico de la SRH, 1974, pp.280-81.

There has been a good deal of criticism over the validity of the extraordinary public investment in irrigation, either for the choice of location and farmers served, or for its emphasis on infrastructure rather than human resources. Nevertheless, it appears that this program is scheduled to be vastly accelerated in the future. The Secretaria de Recursos Hídricos (SRH) -- the ministry in charge of hydraulic resources, is planning to irrigate 336,787 hectares of land, in addition to the 137,842 now in existence, with particular emphasis (according to plans, at least) in Guanajuato, Jalisco, Mexico, Nuevo Leon and Puebla (31, p. 209). SRH expenditures have nearly doubled in every decade since 1950 and in 1970 amounted to 8.4 billion 1960 pesos -- some 36 percent of the total agricultural value of national production. Almost four percent of agricultural production value was spent on small-scale irrigation works. Ostensibly, in 1973, some 43 percent of agricultural value was spent on irrigation works, but I have no expenditure figures with which to back this up (31, p. 209).

Banking credit (shown on Map 9) was concentrated in Chihuahua, Nuevo Leon, Sonora, Tamaulipas and Coahuila in 1970. The only differences between this distribution now and that in 1940, is that in the earlier year, Nuevo Leon was not included, while Baja California, Quintana Roo, Durango and Chiapas were.

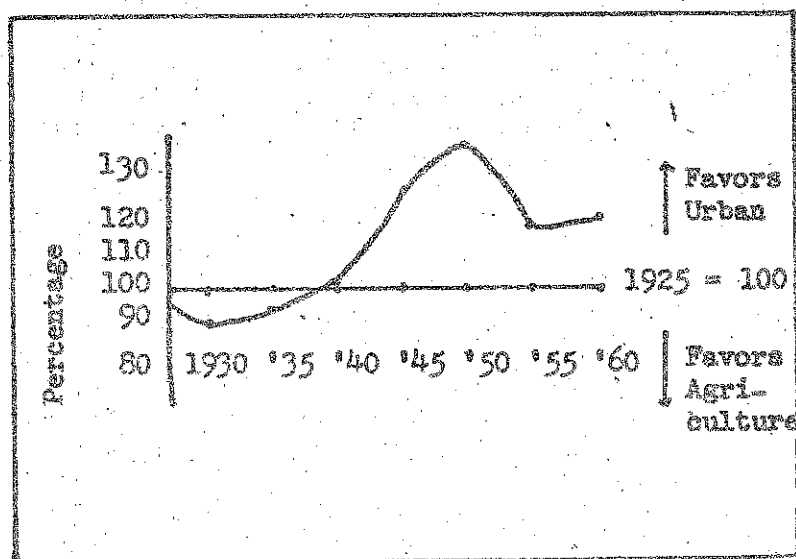
Credit is also highly selective as to crops. In 1972/73, 28 percent of official public credit went for cotton production, 11 percent to maize, 10 percent to wheat, 9 percent to sorghum, 3 1/2 percent to rice, and 3 percent each to beans and sunflower (31, p. 284). These figures have little correlation to areas cultivated of the various crops. From 1950 to 1972, private credit provided around ten percent of total credit, banks 18 percent, the state 26 percent.

Through the past few decades, the general capital use bias in Mexican development strategy was thus fully applied to agriculture, despite the massive rural un- and under-employment. Subsidies for capital investment, low import duties on agricultural machinery, and the wholesale adoption of modern technologies of production all contributed to this bias. Coupled with this was fear of agrarian action by hired workers, for the programs for agrarian reform fostered by the Mexican government were largely unsuccessful at increasing incomes and production generally through the rural sector.

Programs for agrarian reform

Roughly 52 percent of all agricultural holdings in Mexico can be classified as "subsistence" as of 1968. Another 41 percent can be considered "traditional" and only seven percent modern -- those which ascribe to the qualities we described in the preceding section. Chart 2 gives the basic characteristics differentiating the sectors. The modern sector is characterized by much higher income per capita and input availability than are the others. Costs of inputs per hectare are higher for the poorer farmers, who generally have smaller holdings. For poor farmers who do not have large holdings and high production, the turning of the agricultural urban terms of trade against agriculture has been particularly hard. Graph 13 shows the trend in terms of trade since 1925.

Graph 13. Agricultural-Urban Commodity Terms of Trade*



* Clark Reynolds, The Mexican Economy (Yale U. Press: New Haven, 1970), p.108.

Table 2. Characteristics of Mexican Agriculture *

	Modern	Traditional	Subsistence
Percentage farms	7.1	40.5	52.4
Percent land irrigated	33.1	13.1	7.9
Percent improved seeds	85.6	33.6	14.0
Percent fertilized	83.1	41.9	16.8
Percent consumed by producer	7.2	15.5	38.8
Income per plot (pesos)	62,840	9282	3472
Cultivated hectares per plot	33.1	13.1	7.9
Productivity per plot (pesos)	2093	721	522
Capital per hectare	3675	1787	959
Tractor-hrs per hectare	10.8	4.7	.8
Oxen-hrs per hectare	4	23	54
Man-hrs per hectare	260	209	251
Cost of fertilizer per hectare	348	195	39
Cost of insecticide per hectare	47	18	6

* Manuel Rodriguez Cisneros, et.al., Características de La Agricultura Mexicana, 1970, pp.255,264.

Although structure varies a good deal throughout Mexico -- divided primarily into private and ejidal type ownership -- it is access to capital and inputs that always arises as the major constraining factor. In general, however, Mexican programs designed to improve the agricultural base of the traditional and subsistence farmers have never stressed the transfer or creation of such resources for these farmers. Basically, agricultural policy regarding these low-income groups has revolved around ejidalization and the "March to the Sea," both of which treat land as the crucial variable. Distribution of ejido lands has been the cornerstone of Mexican agrarian reform. The ejido is a collectively-owned landholding based on old agricultural forms in pre-Cortesian Mexico and Spain. In the old sense, the "ejido" referred only to the common lands of a village (pasture, town plaza, e.g.), but the Mexican constitution uses the term to include all types of land. During the 1930's, when the first ejidos were being set up, some were designed to be collectively worked, some to be worked in private plots. Today, most are worked privately. The "March to the Sea" describes an official policy aiming to utilize and colonize the sparsely populated and underdeveloped coastal lands, both to increase agricultural production and to decentralize the economy. Major programs included malaria eradication, road-building and hydraulic works.

During the Calles years, private commercial agriculture was heralded as the saviour of the countryside. Very limited land distribution took place, and the little that did occur was soon branded a failure. In 1926, a Law of Colonization distributed private property in Sonora, Chihuahua and Baja California with a direct political mandate for increasing production so as to discredit those ejidos in existence (1, p. 132). One is led to suspect that the cards were stacked against the ejido system from the beginning.

During Cardenas' "Era of Reform," this policy was reversed -- primarily due to increasing violence in rural areas and unceasing demands by campesinos for land. With the collapse of markets and the Depression, and bad times all over Mexico, the Calles gradualist approach to agrarian reform was politically impossible. It was during Cardenas' presidency, however, that legislation for rights of small landholders against expropriation were passed, a policy which was to be much exploited by large landowners (1, p. 139). The extent of this latter exploitation was such in Jalisco, Michoacan and Guanajuato, that the quota for bracero work in the United States was, for political reasons, almost entirely filled from these states (26, p. 48).

It is important to note that the initial period of major ejidalization took place when the move could have little harm from the growing economy. Only 20 percent of GNP came from the sector involved, while 60 percent of the population did (20, p. 154). In later years, huge additional amounts of land were given away (see Table 3), but the numbers are misleading. Graph 14 shows the percentage of arable land distributed. In the North, where almost half of land was given away, only around one sixth is arable.

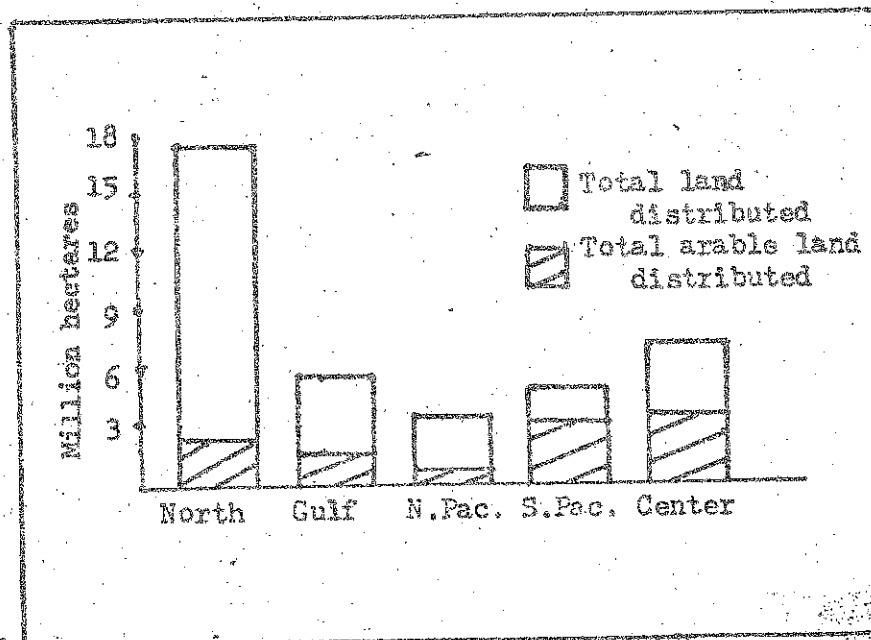
In 1930, only six percent of land was owned by ejidos. By 1940 -- after Cardenas -- ejidos owned 23 percent of land (8, p. 85); there was a mild increase between 1940 and 1960 -- the years of rigid PRI control of campesino groups and the "white guards" of the large landholders who fought off peasant invasions.

Table 3. Land Distributed under Agrarian Reform
1915-1970 *

	Years	Million Hectares	Thousands Ejidatarios Benefited	Hectares per Ejidatario
De la Huerta and Carranza	1915-20	.4	77	14.9
Obregón	1921-24	1.7	154	12.3
Elías Calles	1925-28	3.1	292	8.6
Portes Gil	1929	.8	126	6.7
Ortiz Rubio	1930-32	1.5	117	12.7
Rodríguez	1933-34	2.0	158	13.0
Cárdenas	1935-40	20.1	763	26.4
Ávila Camacho	1941-46	5.3	112	47.3
Alemán	1947-52	4.2	91	46.2
Ruiz Cortines	1953-58	3.6	195	18.2
Lopez Mateos	1959-64	7.9	255	31.1
Díaz Ordaz	1965-70	24.5	396	65.9
Total	1915-70	75.3	2,741	

* Ifigenia de Navarrete, Ed., Bienestar Campesino y Desarrollo Económico (Fondo de Cultura Económica Mexico, 1971), p.53.

Graph 14. Type of Land Distributed by Region (Through 1960)*



*Clark Reynolds, The Mexican Economy (Yale U. Press; New Haven, 1970), p.141.

Between 1940 and 1959, there was a 46 percent decline in the real value of the minimum agricultural wage (13, p. 96), and by the end of this period, there was no outside relief from bracero programs. Corruption in agricultural politics was high, and ejidal organizations and elections were controlled by the Ejidal Bank and other official units. By the early 1960's, however, some measure had to be taken to counter the growing and now uncontrollable land invasions. Lopez Mateos and Diaz Ordaz gave away huge amounts of land, and again almost worthless agriculturally, and often a mere de jure pronouncement of de facto occupation.

It is unfortunate that the main thrust of ejido formation was in the south, where farming was traditionally done on small plots with little large-scale management, as opposed to the northern lands where after the Revolution, there still existed a structure for division of labor on large-scale farms (1, p. 129-31). The ejido policy has been much debated in Mexico, whatever its roots. Ejidos cannot be mortgaged, which makes credit more difficult to obtain. Land cannot be bought and sold. Other problems include farmers' lack of access to inputs and the system of organizational control - including interference from the Department of Agrarian Affairs and other government agencies in ejidal politics and management. The Ejidal Bank has been accused as the most corrupt agency in Mexico (8, 11, 26) -- no mean title. The Department of Agrarian Affairs is said to not only weigh ejidal elections, but to freely allow the continuation of vast illegal holdings all over Mexico.

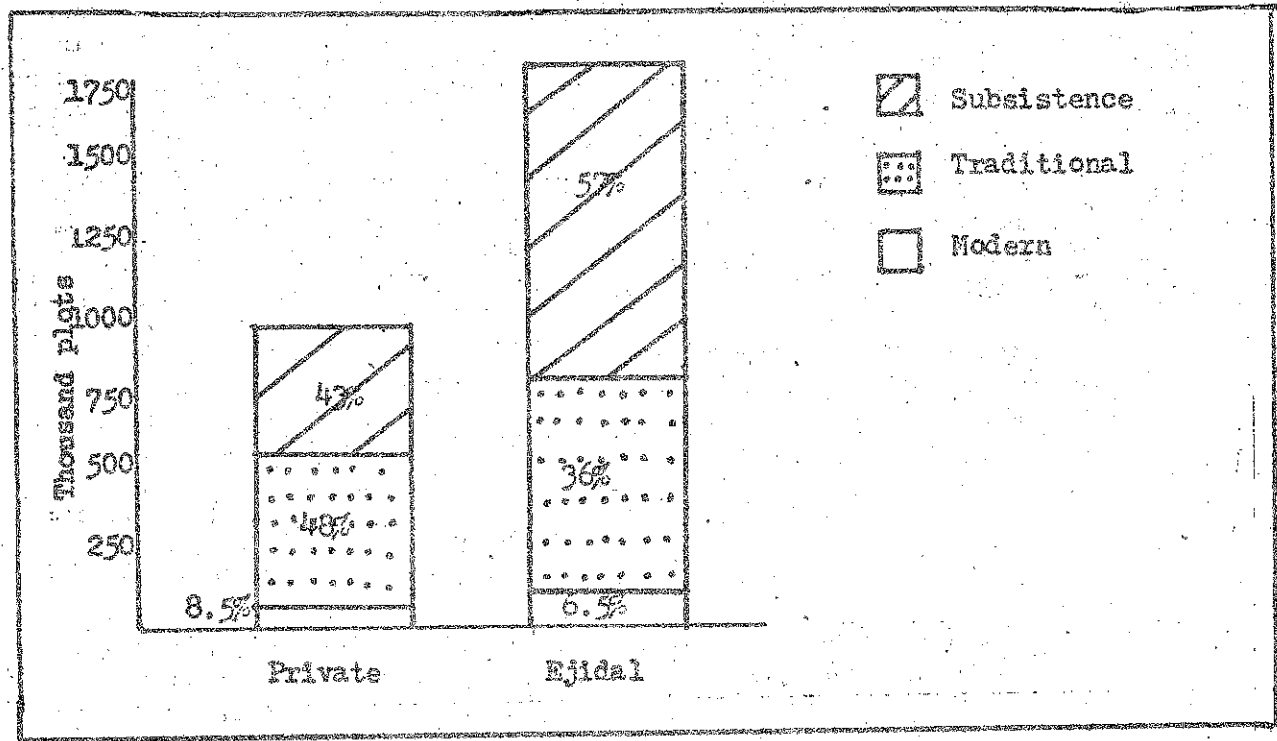
While many have moaned and groaned about this state of affairs, preferring the flexibility of private ownership, it does not appear that the ejidal organization itself is necessarily non-productive. Rather, the major influences on productivity appear to be access to information and capital, the quality of the land under cultivation, and the market mechanisms predominating. Besides, the Mexican government has apparently opted in favor of the ejidal structure, witness the large distributions of the 1960's and the fact that by law, ejidal lands are inalienable.

With the paucity of funds going for ejidal investment and credit, it is surprising that they have done as well as they have. There are ejidos with irrigation, fertilizer and credit who are producing high-value crops and are doing very well. The important point is that a far smaller portion of ejidos are in the modern sector. See Graph 15.

Modern farms, both private and ejidal, predominate in the high-income areas in the North and North Pacific, while the Southern region has less than one percent modern farms. There are far more ejidal farms working in subsistence conditions everywhere. Small private farmers at the subsistence level are primarily found in the Bajio region and in the South. Graph 16 illustrates the regional differences in per holding and per hectare incomes as between sectors and structure. Although income per hectare of most ejido groups competes favorably, if not better than, corresponding private farms, larger size and high input use combine to dramatically increase income on modern private plots. These figures are somewhat distorted, furthermore, as an inexact, but large number of ejidal holdings are, contrary to law, being rented out to commercial farmers who do have the inputs to make them productive (8, pp. 103-15).

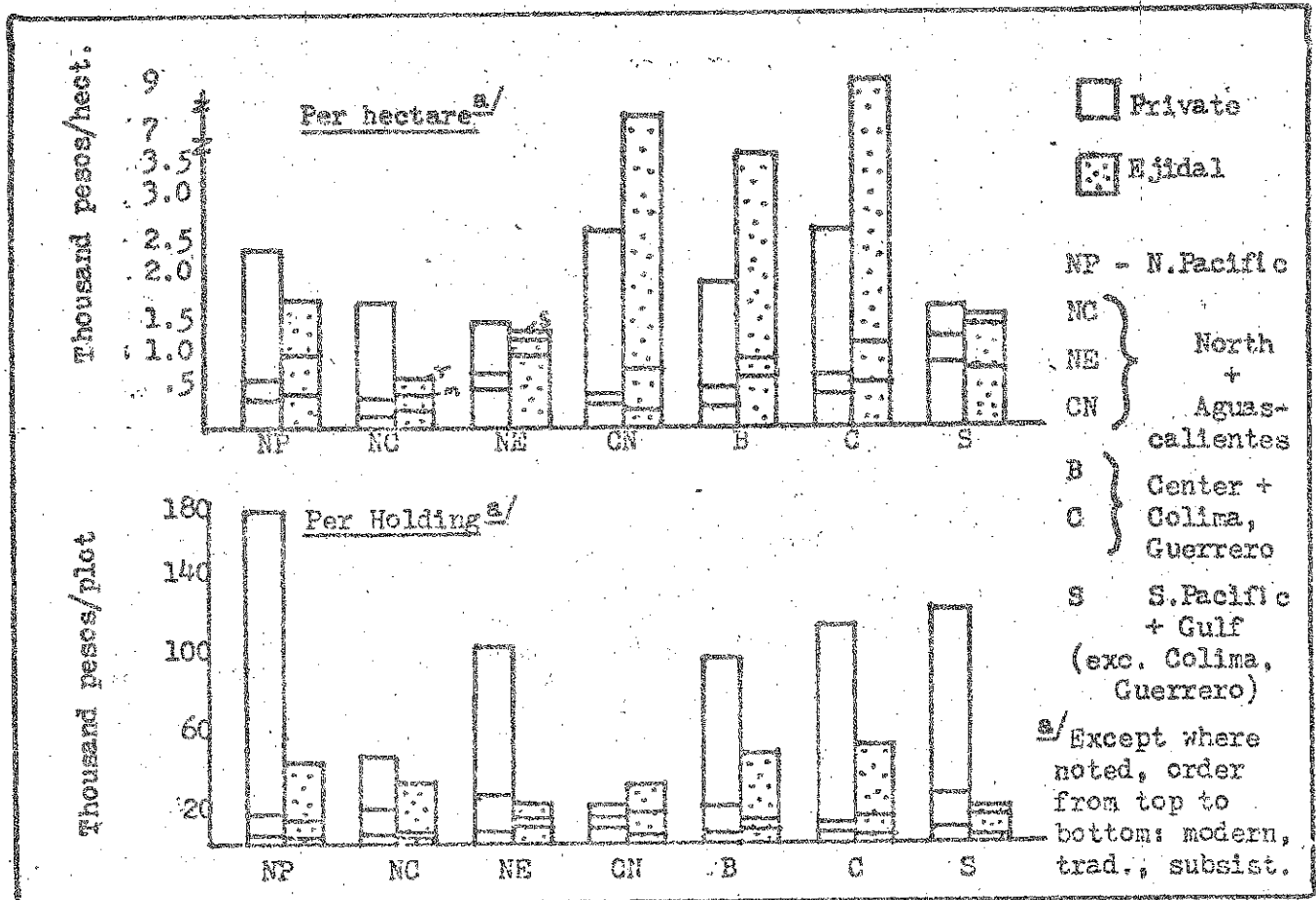
The other major program carried out by the Mexican government to improve welfare of the rural peasants and to decentralize the economy was

Graph 15. Modern, Traditional, Subsistence Sectors by Structures*



* Manuel Rodriguez Cisneros, et.al., Características de la Agricultura Mexicana, 1970, p.156.

Graph 16. 1967/68 - Income by Sector and Region - Private and Ejidal*



* Manuel Rodriguez Cisneros, et.al., Características de la Agricultura Mexicana, 1970, p.262.

colonization, and the regional development commission projects. Between 1919 and 1944, around 1 1/4 million hectares were colonized in some 14,000 lots (17, p. 10). Ejidalization provided for a lot of colonization as lands were given away in fairly remote, undeveloped tropical areas. These were not particularly successful, primarily due to the lack of desire of the population to move into what were considered "unhealthy" tropical areas, and their lack of knowledge about tropical agriculture. Some of the colonization that was carried out was "planned" by Commissions; much was the simple result of land invasion.

The River Basin Commissions were first dreamed up by Avila Camacho in his pronouncement on the "March to the Sea." Significant action did not begin until Miguel Aleman got into office. In 1947, the Papaloapan and Tepalcatepec (which later was expanded to include Las Balsas) Commissions were created. In 1950, the Lerma-Chapala-Santiago Study Commission was initiated, and in 1951, the Grijalva-Usamacinta and Rio Fuerte Commissions began work. See Map 10 for locations of these projects.

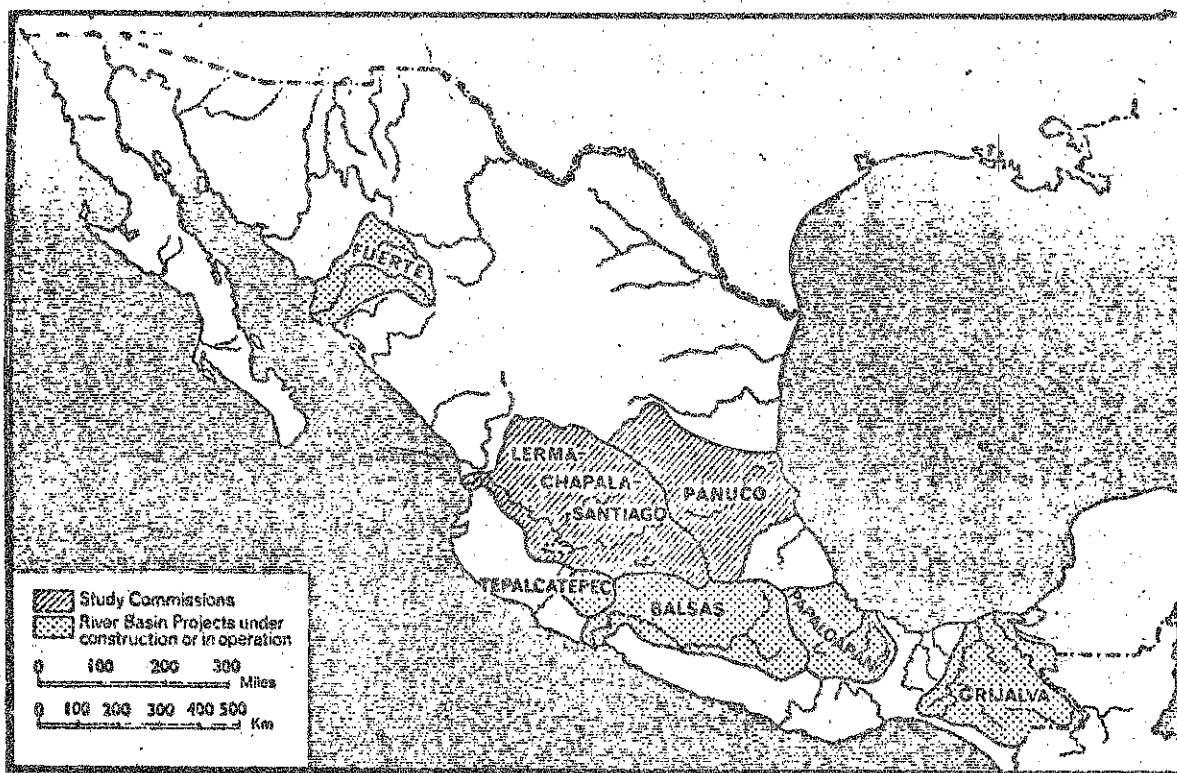
The Gulf Coast projects - the Papaloapan and Grijalva - concentrated on flood control and roads, since major problems in these areas were excess water and isolated markets. The Pacific projects (Balsas and Fuerte) where rainfall was scarce, concentrated on irrigation. All of them except the Lerma-Chapala-Santiago project are under the direction of the SRH, hence the emphasis on hydraulic control projects. The Lerma-Chapala-Santiago study covers a huge area in central Mexico which in 1960 contained 18 percent of the Mexican population. It is headed by a committee with a member in each of the principal states, the SRH, and the Federal Electric Company.

While the projects have certainly led to improvements in communications and income, they have not proved to be economic successes in decentralizing the country, nor in spurring resettlement of the population towards outlying regions. The potential for such programs is certainly high, but inadequate support in terms of funding, supportive legislation favoring regional areas, and lack of continuity have kept the River Basin Commissions far from reaching their potential.

A program more closely related to the problems of the small low-income farmer himself has been the Puebla Project -- a result of joint efforts by the Mexican government, the Rockefeller Foundation and the International Maize and Wheat Improvement Center (CIMMYT) in the State of Puebla. There are similar programs in the states of Mexico and Tlaxcala. During the seven years 1966-73, a total of \$925,045 US were spent on the project. Ninety percent of the farmers had less than five hectares in this area, and maize was the staple crop. A concentrated program to increase maize production through a combination of breeding and farmer's organizations for credit and the procurement of fertilizer was used to improve production, income and provide secondary welfare results. The maize breeding program was given up, although local varieties testing was continued. There were numerous difficulties with various agricultural institutions and the lack of farmer participation, but significant improvement was made in maize yields (27).

In 1973, CIMMYT ceased its involvement with the project, as its expanding interest in crops other than maize and welfare/net incomes increases was considered "not within the role of CIMMYT." The Mexican

Map 10. River Basin Development Projects*



* Richard T. King, River Basin Projects and Regional Development, (Dept. of Agricultural Economics of Cornell University: Ithaca, New York, 1964), p.75.

government, however, is continuing with the project. The Maize Project, sponsored by the State of Mexico, initiated in 1971, includes 240,000 farms with an average size of 2.2 hectares. By 1972, supposedly 19,160 farmers had experienced increases in yields. The Tlaxcala Project in Tlaxcala is directed by the Ministry of Agriculture and Livestock and the state, and includes some 40,000 families. By 1972, yield increases had been experienced by 972 farmers (27). The future and the utility of these programs is not yet proven, but they are doubtless a quite important change of direction from policies which tended to "forget about" this type of farmer.

One other program of importance to low-income agricultural producers is CONASUPO (the Compania Nacional de Subsistencias Populares, S.A.), an originally private institution made public in 1965. This is an agency which fixes minimum prices at which it will buy all that the farmer has to sell, and in turn sells this at subsidized prices to poor urban consumers. This marketing function is very important, as traditionally marketing for the non-modern sector has involved a very large number of intermediaries, which absorbed in the 1960's some 40 percent of the final price: i.e. 70 percent over rural prices (1, pp. 300-2). These are due to high transport costs, costs of storage for speculation and the larger rates of utility for bigger enterprises. CONASUPO also operates storage and silage facilities all over the country, primarily for wheat and maize. Its income from yearly operations is some \$6 billion pesos. The coverage of farmers is increasing, but there is a good deal of debate about its true effect on incentives and the importance of the aid it gives to poor farmers.

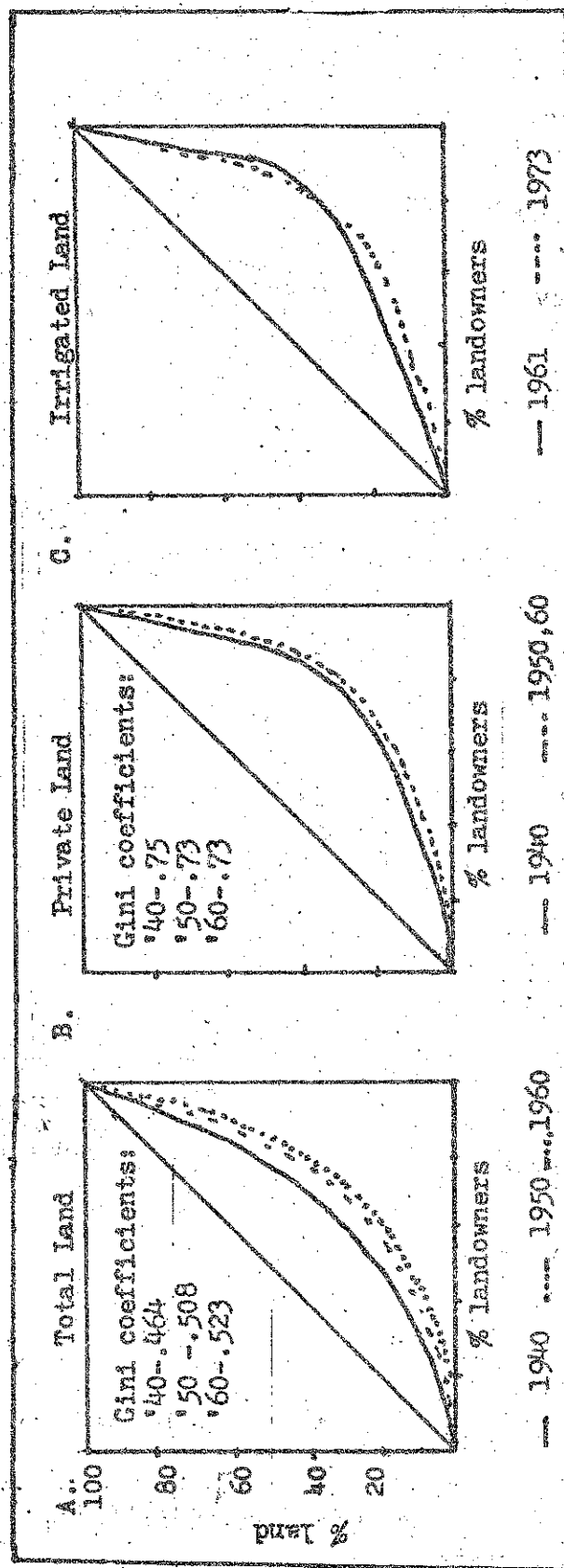
Welfare and politics

Often, when governments cannot adequately handle needs for production increases among the poor, and hence, incomes, aid in other forms is used. In Mexico, an unusually small amount of public expenditures has been put into public welfare for the bottom quarter of the population -- in fact, the lowest in Latin America (20, p. 267). This is despite increasing ability of the economy to support such expenditure and the relative and absolute decline in the real incomes of this sector of the population. Relative rural peace has been bought by periodic distribution of land and the pull of the cities. Peace in the cities has been maintained through subsidies of food, health care, and transportation for some of the poor. But even education -- a vitally necessary element for development anywhere -- has been made a priority expenditure item only sporadically.

The PRI style of political control and the all-powerful position of the President of Mexico have slowed somewhat the political mobilization of the Mexican people, who for cultural and parochial reasons often do not become political participants of their own incentive. Political opposition for the most part is stifled, with the exception of the PAN (Partido Autonoma Nacional), which is actually a more conservative party than the PRI. Nevertheless, the resultant political stability has had a positive influence - primarily by creating a favorable environment for the repatriation of Mexican capital, which was previously held almost entirely in Europe or the United States, unavailable for Mexican use. The turnover every six years of the government bureaucracy and the expanding modern sector have allowed high mobility for the educated classes.

All is not quiet now however - neither in the countryside nor in the city. It appears that if the rural problem is to be solved, some combination of the following will be necessary: first, decentralized, labor-intensive industry must be developed that will absorb the larger part of the rural peoples displaced by modern agriculture; secondly, a more broadly-based investment in agriculture must be encouraged, employing more labor on modern farms or providing more inputs to traditional and subsistence farmers. Of course, the big problem facing the government with any of these alternatives is the resentment of urban groups toward emphasis on the rural areas, and the increasing dissatisfaction of groups in the countryside which may demand major - but perhaps premature - solutions quickly. Whether a temporary peace is all that is being sought now, or whether there is a real desire on the part of the Mexican political elite to "spread the wealth" is the really important variable.

Appendix A. Lorenz Curves for Land Concentration*



* Graph A. - Ifigenia de Navarrete, Ed., Bienestar Campesino y Desarrollo Económico (Fondo de Cultura Económica; Mexico, 1971), p.59.

Graph B. - Reed Hertford, Sources of Change in Mexican Agricultural Production 1940-65 (Diss. U. of Chicago, March 1970), p.39.

Graph C. - Secretaría de Recursos Hidráulicos, Prontuario Estadístico de la SRH, 1974, p.260.

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