

FROM LAND REFORM TO INDUSTRIAL REVOLUTION: THE MEXICAN CASE

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Among Latin American countries Mexico is the sole country self-sufficient in food or, more accurately, who exports her agricultural surpluses. The historical key to this secret, and further to the secret of her industrial growth, may be found in the role played by the Land Reform. In this article the author reviews Mexico's development after the Mexican Revolution and clarifies the process from Land Reform to Industrial Revolution.

According to data from the Food and Agriculture Organization of the United Nations, the present agricultural product of Latin America decreased nearly ten percent per capita, compared to the period 1934-38. Since then, agricultural imports—mostly foodstuffs—increased more than eighty percent and upset seriously the balance of payments of most Latin American countries. In this depressing panorama of economic stagnation and regression, Mexico is the only exception.

The combined effects of land reform, road construction, irrigation, agricultural credit, and the spread of many innovations through research extension and training, enabled the agricultural sector to grow at an average rate of more than 5% during the last thirty years and turned Mexico into the only Latin American country virtually self-sufficient in food.

While growing domestic demand has been met, exports of cotton, coffee, cattle, tomatoes, fresh vegetables, and sugar-cane have increased steadily. Furthermore, until ten years ago it was customary to import corn and wheat to supplement domestic production and meet local demand. Then, quite suddenly, Mexico began to generate surpluses and became an exporter. By 1966, 684,000 tons of wheat and 800,000 tons of maize were sold below world prices to the Socialist bloc and to the United Arab Republic.

Table 1, compiled from data from the FAO, shows the course of agricultural production in eight Latin American countries. Mexico stands as an exception not only in Latin America but in the world. To treble its agricultural product in less than three decades implies a phenomenal sustained rate of growth. It would be difficult to find another country with acceptable agricultural statistics that has grown at such pace in modern times. This record is corroborated in a study of the development of agriculture in twenty-six nations undertaken by the U. S. Department of Agriculture, in which Mexico's rates of growth are shown to be surpassed only by Israel and Japan.¹

Table 1. Index of Agricultural Production in Eight Latin American Countries (Based on the Period 1934/38=100*, Final Year 1965)

Country	
Argentina	133
Brazil	196
Chile	166
Colombia	227
Cuba	153
Mexico	324
Peru	193
Uruguay	139

Note: *linked index.

Source: Data from FAO, taken from Folke Døving, *Land Reform and Productivity: the Mexican Case, a Preliminary Analysis*, Department of Agricultural Economics, Agricultural Experiment Station, University of Illinois, November 1966, p. 4.

This does not mean, of course, that Mexico has solved all its agricultural problems and has somehow built a rural utopia. Far from it; much of farming is still done with very primitive technology which demands strenuous efforts, is plagued by risks, and yields very little to most peasants. Average income per capita is roughly 60% lower than industrial and urban income. In rural areas life expectancy is much shorter than in urban areas; illiteracy is higher, unemployment and underemployment prevail, and there are fewer opportunities for personal advancement. Moreover, there are regions like Zacatecas, Yucatan, Tarahumara, and the Mixteca, where many people still suffer chronic, unmitigated, outright hunger. In recent years there have been frequent newspaper reports of localized peasant uprisings and land invasions in scattered parts of the country. But, without minimizing the seriousness of these events, one should not forget that the huge industrial and urban growth attained during the last three decades, has required a very high rate of capital formation, and that capital accumulation in underdeveloped countries with rural overpopulation is a cruel and painful process, in which capital for overhead investment and growth comes inevitably from enforcing austerity on the bulk of the population.

The industrial backwardness of Mexico in the 19th Century and the turbulence of the revolution in which most of the productive plant was destroyed, made the first twenty years after 1910 a period in which agriculture was virtually the only source of capital for urban-industrial growth. One must recall that between 1910 and 1941 capital, both national and foreign, fled abroad. During the armed period of the revolution 1910-1917 there were nearly one million casualties. Thousands of Mexicans fled to Los Angeles—Mexico's second largest city—and to other parts of the United States, just

¹ United States Department of Agriculture, *Changes in Agriculture in Twenty-Six Developing Nations, 1948 to 1963*, Foreign Agricultural Economic Report No. 27, November 1965.

as Cubans today to Miami. In 1914, Veracruz was bombarded and occupied by U. S. military forces that stayed more than six months—from the shores of Montezuma, etc. On March 9, 1916, Pancho Villa raided United States territory and burned the town of Columbus, New Mexico. In reprisal, on March 13, General Pershing's punitive expeditionary forces invaded Mexico and stayed for about eleven months. President Calle attacked the Catholic Church, which has always opposed the revolution, and the Church fought back with all the earthy and supernatural means at its command. Land and property, of citizens and foreigners alike, were confiscated. In 1929 payment on the foreign debt was suspended. In 1937 Cardenas nationalized the railroads; in 1938 he nationalized oil. The image of the Mexican bandit and of Mexican lawlessness spread far and wide. No wonder, then, that Mexico's international financial position should have been precarious—as much as, or more so, than that of present-day Cuba.

In 1926, direct foreign investment was estimated at 3,500 million pesos. The paper value of this sum was reduced by the 1929 crash; the expropriation of oil and the railroads turned part of it into public debt and inflation reduced its value in real terms even further. By 1939 total direct foreign investment was estimated at 2,500 million pesos; of this, 50% went into public utilities and transport and 40% into mining.

Foreign trade somewhat relieved the acute shortage of foreign currency which followed the revolution. During the decade of 1920-30 exports of petroleum, minerals, and henequen reached record figures, and the terms of trade between 1925 and 1929 were favorable to Mexico. The 1929 depression cut down exports drastically, but by 1933 their level began to rise anew.

On November 19, 1941, Mexico returned to international financial respectability after President Avila Camacho and President Roosevelt signed an agreement in which Mexico committed herself to pay foreign claims in part.²

Between 1910 and 1941 there were only two rather unusual instances of incoming capital: Jewish refugees coming in search of sanctuary, after Hitler took over in Germany, brought capital, and the Spanish Republicans, after their defeat by Franco, brought half of the Spanish treasury (the other half went to Russia). Because of the clandestine circumstances surrounding both transfers, it is impossible to give even a rough estimate on their amount. Aside from financial capital, it is well worth mentioning the inflow of "human capital" or "non-conventional capital." The concept refers to the technical, scientific, or artistic ability of individuals. Most of the Jewish and Spanish refugees were, indeed, first-rate "human capital." Many were scientists and technicians trained in the best European universities; others were men of letters, artists, philosophers, and celebrated thinkers. This group contributed notably to the modernization of the country. Without doubt, the growth of the economy would not have been as fast or steady had it lacked the participation of European technicians and intellectuals who repaid with largesse

² See Howard F. Cline, *The United States and Mexico*, Cambridge, Harvard University Press, 1953.

the sanctuary offered them by helping to build modern Mexico.

But with due allowance for these exceptions, the fact remains that *between 1910 and 1941 no foreign capital entered Mexico. On the contrary, wealthy Mexicans with liquid capital sent it abroad and thereby aggravated the balance of payments deficit.* There were, therefore, only two ways to increase the domestic rate of capital formation: (1) the classic, painful, and expedient recourse to squeezing agriculture as much as possible; and, (2) the more enterprising transfer of workers from agriculture to the emerging industrial and urban sectors, and their employment at subsistence wages in activities which would eventually increase the productive capacity of the system. This is how public works were financed and how huge government deficits were covered until 1942. This explains largely the paradox of the success and failure of Mexican agriculture: the penury of the peasants and slum dwellers and the impressive agricultural industrial and urban growth.

The steady drain on agriculture for capital formation purposes, begun in 1925 during the Calles administration, inevitably imposed very low levels of consumption on the peasant masses and accounts for the absence of anything resembling welfare in rural areas. The peasants tolerated this forced austerity because it came from the same government which was giving them free land and which was engaged in vigorous and unprecedented efforts to build dams, highways, and schools for themselves and their children—as shown by the budget that gave number one and two priorities to public education and public works.³

The level of agricultural development achieved thus far does not mean that Mexico has reached adequate standards of living for all members of the rural population, as indeed we have not. Instead, this development—as well as increased petroleum and tourist revenues—accounts largely for the sustained expansion and diversification of the economy.

Foreign investment entered the picture after 1942. Its importance since then has generally been overrated due to the discordant effects produced by the clash between the loud advertising of the products of foreign firms, and our brand of nationalism which has many elements of xenophobia. In fact, foreign investment entered the picture only in the past three decades; it has never exceeded 15% of total investment; it comes from different countries and cannot take credit for the growth of the economy in any important way. Foreign investment, incidentally, seems to have acquired better manners and carefully refrains from the greed, arrogance, and paternalism of old.

Recently, some influential Mexicans have begun to think that the growth of agricultural, industrial, and service sectors has finally provided Mexico with the productive potential in terms of food, factories, equipment, and technicians required for improving rural and urban welfare. If this idea prevails, the coming phase of Mexico's development will be concerned with her entry on the stage of mass consumption under conditions approaching

³ See Leopoldo Solís M., "Hacia un análisis general a largo plazo del desarrollo económico de México," *Demografía y Economía*, Vol. 1, Núm. 1, El Colegio de México, 1967.

full employment.

The Land Reform

The key to understanding contemporary Mexico is to realize, first, that the triumph of the 1910–1917 revolution imposed a new social order, and second, that this order lacked an economic foundation. Since then, the main goal of economic policy has been to create a productive structure compatible with the new social principles, and capable of supporting and of continuing a political system in which the most important groups in society have effective representation.

It is not surprising that the people of a backward, agrarian economy, plagued by concentration of land ownership, extreme income differences, and resource waste, should be obsessed with the idea of land reform. Under such conditions, what other immediate solution could be sought? Perhaps this explains why agrarian reform was the primary weapon on which the Mexican Revolution relied to achieve economic growth and social equality.

The Revolution had another effect which, in its initial stages, was perceived by few Mexicans: it opened the country to overwhelming innovational forces. Mexico shed the inertia of the Colonial period to enter the cosmopolitan stream of the 20th Century. Unwittingly, the conditions for the industrial revolution had been fulfilled. The barriers to economic growth were shattered. Under the new order, technological progress became an imperative for survival. In spite of its limitations, and irrespective of the narrowness and simplicity of its initial propositions, the effects of official policy spread to some of the most remote corners of the land and prompted many second thoughts which, gradually, resulted in expanding the scope of economic policy and in giving it greater cogency.

The land reform confronted the country with a situation of the kind Toynbee calls challenge and response. The subsequent emergence of modern Mexico is the consequence of a positive reaction to this critical challenge. The break-up of the *hacienda* system released the multitude of complex forces to which Mexico owes her growth. The destruction of the main source of power and income of the landed oligarchy emancipated the peasants, gave the rural population horizontal and vertical mobility, eliminated the caste system and, for the first time in our history, made it possible for the common Mexican to aspire to individual improvement and to a better future for his children.⁴

A new power structure replaced the old. The leaders of this true, irreversible revolution—Zapata, Calles, Obregón, Cárdenas—showed passionate concern for the people and the nation. These momentous changes set the stage for political stability, economic development, and an exciting cultural renaissance. They also nurtured a cohesive, petulant, and enterprising nationalism without which the great collective effort required for the success of the Revolution probably would have failed.

⁴ See Pablo Gonzales Casanova, *La democracia en Mexico*, Ediciones ERA. México, 1965.

As land began to be redistributed massively, it became imperative to increase productivity, to diversify production, and to industrialize. First came irrigation and road construction: afterwards, urban expansion. Both combined to generate a huge demand for cement, steel, and other products of the construction industry, thus setting the stage for the industrial revolution. This encouraged the growth of the rate of capital formation, since according to W. Arthur Lewis,

The expansion of capital is a function of the rate at which the building and construction industry can be expanded.⁵

That is how the Mexican economy entered the industrial revolution.

From 1915 to date, 56 million hectares (138 million acres) of all types of land—more than 50% of all the productive land of Mexico—have been distributed among 2.4 million peasants. These lands were freely granted to agricultural communities called *ejidos*. The *ejido* is a system of communal tenure modeled somewhat after the ancient Indian communities whose land was usurped by the *hacienda*. *Ejido* lands are held as the property of a town or village, either for collective use or for distribution among *ejidatarios* for cultivation in small plots to which each individual has the right of occupancy and usufruct. The average size of the *ejido* plot is 6.5 hectares (16 acres). But, given the tremendous regional differences peculiar to Mexico's geography, this average is meaningless. *Ejido* land cannot be sold or mortgaged.

At present, there are 18,000 *ejidos*. Approximately 4,000 of them are operated collectively and produce cotton, sugar-cane, rice and hemp. The remaining 14,000 are worked individually.

To compensate landlords, the Government issued bonds, but only approximately 0.5% of the total value of expropriated land was paid for. Even in the case of land owned by foreigners (79 million acres), compensation was not paid in accordance with the rigid principle of "prompt, adequate, and effective" payment as the United States State Department demanded. Instead, it was subject to long and protracted negotiations, culminating in an agreement between the Mexican and American governments under which payment was geared to the financial capacity of the expropriating country and extended over a long period. In that way a precedent was set which may be of great importance to the success of future land reforms in other Latin American countries.⁶

The land reform also created small family farms called *pequeñas propiedades*, which were inspired to some extent by the American family farm. Their area varies from 100 to 150 hectares (250 to 360 acres) of irrigated land or its equivalent in land of lower quality. These farms were created from lands which were exempt from expropriation when the *ejidos* were formed, and

⁵ W. Arthur Lewis, *The Theory of Economic Growth*, London, George Allen & Unwin Ltd., 1955, p. 208.

⁶ See Edmundo Flores, *On Financing Land Reform: A Mexican Case-book*, Studies in Comparative International Development, Volume III, Number 6, 1967-1968, Social Science Institute, Washington University, St. Louis, Mo.

which remained the private property of the old *hacienda* owners. At present, there are approximately 40,000 *pequeñas propiedades*, the average size of which is between 100 and 250 hectares (250 and 600 acres), and they cover an area of about 7.5 million hectares (17 million acres) of the best land. The appearance of a trend toward the concentration of land ownership in irrigated areas must be reported. Increasingly, former landlord families and members of the "new class" have begun to operate many *pequeñas propiedades* under a unified management particularly in the production of export crops. The landless peasants with agrarian rights—more than one million and a half—and old agrarian reformers derisively call the owners of these huge, commercial enterprises "nylon farmers." Obviously, these new units are not comparable to the old *haciendas*. Yet, concentration of land ownership, even if it leads to efficient resource use and increased production, is against the land reform laws and against the spirit of the agrarian revolution.

In addition, there are approximately 1.4 million privately owned holdings of smaller size which cover an area of 170 million hectares and, finally, there are still about 500 large *haciendas* of between 125,000 and 250,000 acres each. As a rule, these *haciendas* are located in remote, semi-desert regions or in virtually inaccessible tropical jungles, or else they are owned by powerful politicians.

To summarize, in 1910 there were in Mexico 8,431 large *haciendas* and 48,633 ranches (between 200 and 1,000 hectares) making a total of 57,064 agricultural properties. Out of a population of 15 million, less than one percent (0.3) were landowners, the rest of the people were landless! Today *ejidatarios* and private owners make a total of 3.8 million persons, or 8.6% of the total population.

The New Agricultural Structure

Since 1929, the agricultural product increased at approximately five percent per annum on the average, though in the period 1959-68 it seems to have maintained a slightly higher rate of growth. However, since at the same time the gross national product increased at an average exceeding six percent, by 1967 the agricultural product amounted only to 15.7% of the gross national product. See Table 2.

Index numbers of crop production for the period 1929-65 appear in Table 3. In closer detail, Table 4 shows the behavior of the seven most important agricultural products for the more recent period 1960-67.

The increases variously depicted in the four preceding tables were possible because of the combined and cumulative effects of many innovations. While the relative importance attributed to the variables involved is open to discussion, there is little argument about the main components of rural development in Mexico, namely:

(i) The land reform which, by destroying a rigid tenure structure inimical to innovation, opened the way for a policy of trial and error aimed at the modernization of the country.

Table 2. Mexican Economic Growth: 1950-67 (1950 Prices)

	1950	1960	1967
Gross Domestic Product (In million pesos)	41.060	74.317	114.262
Agriculture and Livestock (%)	21.7	18.3	15.4
Industry (%)	30.4	33.1	36.7
Commerce, Services and Others (%)	47.9	48.6	47.9
Per Capita Aggregate Consumption (In pesos)*	1,303.00	3,631.00	5,224.00 (Current Prices)
Per Capita Gross Domestic Product (In dollars)	182.00	353.00	528.00

Note: * includes changes in inventories.

Source: Bank of Mexico, S. A.

Table 3. Index Numbers of Crop Production: 1929-65

	Physical Production*		
	Domestic Use	Export	All Crops
1929	100	100	100
1939	148	117	137
1949	254	210	239
1959	379	397	386
1965	523	534	527

Notes: Index numbers are of the 25 principal crops, 16 mainly for domestic consumption and 9 for export. These 25 crops represent close to 90 percent of total crop production.

* weighted by average prices 1929-65.

Source: Bank of Mexico, S. A.

Table 4. Main Crops (In Thousand Tons)

Years	Maize	Wheat	Cotton	Coffee	Sugar-cane	Beans	Sugar
1960	5386	1190	470	124	19542	528	328
1961	5561	1373	450	127	19167	723	333
1962	6337	1455	523	140	21116	666	289
1963	6070	1703	457	142	22150	698	329
1964	8454	2134	504	145	24748	795	325
1965	8400	1876	552	159	28039	812	394
1966	9105	1609	601	185	23400	945	390
1967	9264	2096	565	165	25800	1008	392

Source: National Financiera, S. A.

(ii) The expansion of acreage caused by the policies of irrigation and road construction, that opened up lands previously idle.

(iii) Massive shifts in land utilization, from extensive to intensive crop production and cattle-breeding which, in turn, were stimulated by increased demand from urban-industrial expansion as well as by modern transportation and communication and by favorable prices inside the country and abroad.

(iv) And, finally and more recently, increase in productivity generated by the spread of modern technology and research: highyield seeds, fertilizers, fungicides, antibiotics, machinery, food processing and packaging, etc.

Quantification of the share attributable to each component is, of course, difficult since all these different families of innovation pervade the whole process, overlap, and cumulatively reinforce each other.

The Expansion of Acreage by Irrigation and New Roads

The National Irrigation Commission was founded in 1926. Subsequently, total government investment in irrigation through 1968 amounted to 15.7 billion pesos (1.7 billion dollars). Until the late 1940's irrigation works were paid for by deficit financing. The area harvested in irrigation districts in 1966-67 was 2.6 million hectares or twenty-five percent of the total harvested area. The construction of dams and other irrigation facilities initiated in 1926, absorbed over 90% of public investment in the agricultural sector since this policy went into high gear during the early forties.

Highway construction also had high priority on public expenditure. The construction of a network exceeding 60 thousand kilometers made accessible lands which previously were idle or were operated extensively. The new highways linked agricultural regions with consumption centers and ports. Thus, highways and urban-industrial expansion generated huge external economies, stimulated shifts toward more intensive land utilization patterns and made accessible lands which were either idle or else were operated merely for subsistence.

For example, a survey of the *ejidos* of the State of Mexico—a state adjacent to Mexico City—showed that despite fragmentation of land holdings caused by the land reform in an area of very high population density, the dairy-cattle population, even in very small *ejidos*, had increased considerably because of the proximity of Mexico City and the fresh milk demand of its 7.5 million population.⁷

There are no estimates of the effect that the spread of urbanization and communications has had upon the expansion of acreage and the increase of productivity, but there is no doubt that such shifts contributed substantially to create a more intensive, diversified and efficient pattern of land utilization.⁸

Domestic Price Supports

Mexico began its price support policies in 1937. Initially, this policy sought to lower the prices of basic foods and favored urban consumers at the expense of farmers. In recent years, however, prices have been raised generally above the world market level and the terms of trade have tended to favor the commercial producers in the agricultural sector. At present, the price

⁷ *Los Ejidos del Estado de México, Catálogo*, Gobierno del Estado de México, Dirección de Agricultura y Ganadería, Toluca, México, MCMLVIII.

⁸ See Edmundo Flores, "The Significance of Land-Use Changes in the Economic Development of Mexico," *Land Economics*, May 1959, Vol. XXXV, No. 2.

support agency CONANSUPO (Compañía Nacional de Subsistencias Populares) supports the prices of maize, wheat, beans, rice, sorghum and chile. Approximately half of the wheat crop, ten percent of the corn crop and marginal quantities of the other products are handled through CONANSUPO.

The agricultural sector has also shown itself sensitive to world prices. Favorable prices abroad have stimulated production. In 1950-55 cotton production increased twofold largely because of favorable competitive conditions created by the price support policies of the United States, which caused the "umbrella effect." Since then, cotton has been the leading agricultural export commodity. Likewise, the withdrawal of Cuba from the United States market acted as a powerful incentive to increase sugar-cane production from about 19 million tons in 1960 to around 25 million tons in 1967. At the same time, domestic consumption increased by 40%, while exports of sugar reached the half million mark. The limiting factor to further increases of sugar production lies, of course, in the behavior of world prices. Since 1960, agricultural exports increased more than 40%. See Table 5.

Table 5. Agricultural Exports (In Million Dollars)

	1963	1964	1965	1966	1967
TOTAL	380.9	434.3	535.9	550.0	464.9
Cotton	199.2	173.1	214.7	221.9	143.6
Coffee	49.1	95.2	73.1	83.5	60.1
Tomatoes	24.5	33.9	35.1	62.9	49.4
Cattle and Meat	63.5	41.2	55.3	68.4	55.9
Maize	—	15.9	77.2	46.7	72.6
Wheat	5.0	35.8	41.6	3.9	12.6
Others	39.6	39.2	38.9	62.7	70.7
Fish, Shrimp, etc.	53.5	55.5	44.6	55.6	63.4

Source: Nacional Financiera, S. A.

Productivity and Extension

Gains in productivity have been mounting steadily. Take wheat for example. National average yields per hectare rose from 685 kilos in 1925-29 to 1,640 kilos in 1960-62. Afterwards, the discovery and dissemination of high-yield varieties pushed average yields up to 2.4 tons per hectare and yields of 8 tons per hectare are not unusual. Since 1950 average yields of potatoes increased 65%; cotton yields increased 85%; beans 50% and maize 25%. Recent breakthroughs in highyield hybrids will undoubtedly push up these averages in the immediate future.

Fertilizer consumption went up from 664 thousand tons in 1960 to 1.3 million tons in 1967. There are plans to double fertilizer production in the next three years. Since 1960 domestic production of fertilizer increased on the average of 20% per annum.

The National Institute for Agricultural Research of the Ministry of Agriculture, in cooperation with the Rockefeller and Ford Foundations and with

FAO, has established several stations to develop and test new varieties of crops and to improve the livestock industry through breeding centers, pasture improvement, research in animal nutrition, and importation of breeding stock.

Attempts to successfully operate an extension service fashioned on the United States model have failed and little can be said of Mexico's extension service. Before other developing countries try to copy the American experience its careful re-evaluation will be necessary. Surely, today, the transmission of technical know-how can take advantage of the many short-cuts created by the development of mass media communications.

Population Shifts: Agriculture, Industry, and Urban Relationships

Between 1910 and 1967, population rose from 15.1 million to 45.6 million, i. e., an absolute increase of 30.5 million and a relative increase of 202%. The annual rate of growth for the whole period was 2.7%; but considered by decades, this rate shows an accelerated growth. In 1930-40 it was 1.7; in 1940-50, 2.8; and in 1950-60, 3% annually. Estimates for 1960-67 place it at 3.9%. The outlook for 1980 is a total population of 60-65 million. In all probability the rates of population growth will continue increasing during the rest of the decade and will start declining slowly in the 1970's. Such decline will come from new attitudes and behavior patterns derived from increased income, education, and urbanization. Without these prerequisites birth control policies will not be effective, assuming no radical changes in birth control techniques.

In 1910, 77.7% of the population was rural, that is to say, living in communities or population centers of less than 2,500 inhabitants according to the census definition. Approximately the same percentage of population was illiterate. In 1967, the percentage of rural population declined to 43% and the percentage of illiteracy had dropped to around 30%. Urban population rose from 22.3% in 1910 to 57% in 1967. During the past decades Mexico has been exposed to an intense process of urbanization. The revolution and the land reform caused people to flee to Mexico City, to the neighboring towns of the Mesa Central, and to the United States in search of security. This was the first step in a steadily mounting exodus from country to town. Mexico City's population increased from 368 thousand inhabitants in 1900 to an estimated 7.5 million today.

The original proprietors of urban real estate were the members of the old landed elite; but whereas the *haciendas* had been expropriated virtually without compensation, urban properties were spared and their value multiplied at a terrific rate. Hence, when the system began its upward movement a few years after the forced capital levy of land reform, the landlord class became again the recipient of even larger rents from urban real estate holdings. Metropolitan expansion and sharply competitive land-use shifts generated high rates of capital formation. The internal economies derived from urban growth exceeded by far the partial diseconomies produced by the bottlenecks which came with the emergence of this new pattern. But the massive migra-

tion from country to town kept wages low and depressed labor's share of total income vis-à-vis a correspondingly larger share in the absence of land taxes and of adequately progressive income taxes.

The huge demand for construction industry materials generated jointly by public works and urban expansion assured high returns to investment. Conditions for the emergence of the construction industry were fulfilled, and high rates of capital formation ensued. Basic industry—cement, iron and steel, glass—was financed with savings from real estate fortunes supplemented by credit from the public sector and from abroad.

Steel ingot output increased from 102,800 metric tons in 1930 to 3.0 million tons in 1967; generation of electricity went up from 1.4 million KWH in 1930 to 20.9 million in 1967; cement output increased from 224,000 metric tons to 5.5 million in 1967; petroleum is up from 106,351 barrels a day in 1938—when Mexico expropriated foreign oil holdings—to 410,750 barrels a day in 1967. The final payment for expropriated oil holdings was made in the fall of 1962.

From before the land reform until 1930, 70% of the labor force was employed in agriculture; this percentage declined to 54 in 1960 and to 48% in 1967. However encouraging, this decline does not tell the whole tale. In 1930, only 3.6 million people were in agriculture while in 1967 this number rose to 7.1 million, that is, a net increase of 3.5 million laborers.

Despite its rapid expansion, and despite the emergence of a fast growing industrial sector which today comprises about 25% of the labor force, agriculture remains congested and ridden by unemployment and underemployment. On the average, subsistence farmers whose number exceeds one million families, work no more than 150 days a year; they live in miserable conditions and earn an estimated average family income of less than 100 dollars per year. During World War II, approximately 2 million Mexican workers migrated temporarily to the United States to work in agriculture and on the railroads. In spite of their large number, agricultural output increased in Mexico above average rates during their absence. This suggests that the marginal productivity of the Mexican peasant is very low. The fast-spreading improvements in farm technology will not alleviate rural unemployment because, to a large extent, they have labor-saving effects.

The remarkable development achieved thus far and the accelerated growth and diversification of production in the foreseeable future assure Mexico of a growing supply of food and raw materials for domestic consumption and export. This forecast assumes substantial increases in expenditures for research and training at different levels, and improved extension-service techniques, as well as additional irrigation, electrification and mechanization. Since these steps are part of present-day official policy, there is ample reason to believe that the availability of food will cease to be a limiting factor to Mexico's general development.

When so often in the field I see the many transformations going on in Mexican agriculture, I realize that modernization, diversification, and inte-

gration between agriculture and breeding and between agriculture and industrial and urban activities, are taking place so fast and successfully that anticipating annual rates of growth of around seven percent for the whole sector does not seem as improbable as it would look solely from a statistical viewpoint. Since it is obvious that a continuously expanding part of the agricultural sector is becoming increasingly sensitive to changes in domestic and foreign demand, important shifts may be predicted away from cotton, coffee, sugar-cane, and wheat into fresh vegetables, fruits and beef, for all of which there is a huge market in the United States, Canada, the Caribbean and even Europe and Japan. Development of the dairy industry to satisfy growing domestic needs is also a sure bet.

To attain higher levels of employment, income, and welfare in the rural sector, however, it is essential to reduce the size of the labor force in agriculture to approximately 30% of the total within a reasonable time. This means that more than 3 million peasants will have to leave farming, or the squalor and idiocy of rural unemployment, to work in urban-industrial activities. Referring to the growth of the labor force Bruce F. Johnston notes that:

Between 1950 and 1960 the nonfarm labor force in Mexico increased at nearly 4.0 percent. Apart from Taiwan, where special circumstances existed, this is the only instance that I have found that exceeds the 3.7 percent rate registered in Japan between 1955 and 1964. But the "coefficient of differential growth"—i. e., the difference between the rates of growth of nonfarm and total employment which determines the rate of change in sector proportions—was much lower in Mexico because the total labor force was growing at 3.1 percent compared to the rate of 1.4 percent in Japan.⁹

Thus, today more than ever, agricultural policy is inextricably tied to industrial, fiscal, educational, and general development policies. Industry has become diversified and has begun to produce a torrent to low-priced consumer goods: radios, sewing machines, bicycles, motorcycles, medicines, cosmetics, clothing, kitchen gadgets, movies, newspapers, books, etc. Since Mexico cannot hope realistically to find substantial export outlets for this steadily growing, somewhat coarse, flow of goods in the immediate future, its only available outlet happens to be its own domestic market. This means that further development of its industry depends upon creation of a vast domestic market. In turn, this market will not expand at the high rates required without full employment, or a close approximation thereof, in agriculture and industry. But, since full employment requires higher rates of investment, Mexico will have to resort to effective, progressive, income taxation and to long-term foreign credits for the import of capital goods.

Modern fiscal theory is not beyond the grasp of hard-working undergraduates. Nonetheless, its application to underdeveloped countries so far has been impossible. The difficulty, of course, is not conceptual but *instrumental*. An effective, progressive, fiscal policy requires a good civil service.

⁹ Bruce F. Johnston, "Agriculture and Economic Development: The Relevance of the Japanese Experience," *Food Research Institute*, Vol. VI, No. 3, 1966, pp. 274-275.

But a more-or-less efficient, more-or-less responsible, and more-or-less incorruptible public administration is itself a complex, sophisticated, by-product of development. Incidentally, this elementary vicious circle escaped the attention of those who planned the Alliance for Progress.

As we have seen, five decades ago, the governments of the Revolution began to pursue many new policies. Some failed, others succeeded. Often, success was determined by good administration. Today, the highly-centralized public administration of Mexico has the trained personnel and experience gathered during the implementation of our massive, long-term, policies of land reform, public works, industrial development, social security, and public education. Meaningful comparison with public administration in the United States or European countries is difficult because of the unavoidable and subtle intrusion of ethnocentric valuations. Mexico, however, appears to be in a better position than any other Latin American country to follow the fiscal policy required for accelerated growth at high employment levels.

With reference to long-term foreign credits for capital equipment, the international position of Mexico is excellent. Paradoxically, the very success of our early, radical, policies gives Mexico today the opportunity of adopting more sedate and conventional attitudes. In the turmoil and uncertainty of our times, the stability and rapid growth of Mexico provide unusual guarantees.

Clearly, the economic and social problems faced by contemporary Mexico are more complex than those of the past. Their diagnosis requires deep insight and understanding of the dynamics of Mexico's very own growth. Their solution will demand unyielding adherence to the principle of self-determination and political finesse; as well as an even greater joint effort than any required in the past. But the rewards may also be unusual, for there is a strong probability that Mexico will be the first indigenous society in our hemisphere to build a free and independent welfare state. Although, if Mexico should fail to meet the exacting demands of modern competitive development it could conceivably follow in Argentina's footsteps: a country that after spectacular strides toward economic development and political democracy has turned into a worrisome case of arrested growth and political deterioration.