

AGENCY FOR INTERNATIONAL DEVELOPMENT
WASHINGTON, D. C. 20523
BIBLIOGRAPHIC INPUT SHEET

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BATCH # 16

1. SUBJECT
CLASSI-
FICATION

A. PRIMARY

Agriculture

AE10-0000-G404

B. SECONDARY

Agricultural economics--Mexico

2. TITLE AND SUBTITLE

Integrating the rural market into the national economy of Mexico

3. AUTHOR(S)

Myren, D.T.

4. DOCUMENT DATE

1968

5. NUMBER OF PAGES

13p.

6. ARC NUMBER

ARC

MX630.972.M998

7. REFERENCE ORGANIZATION NAME AND ADDRESS

Wis.

8. SUPPLEMENTARY NOTES (Sponsoring Organization, Publishers, Availability)
(In Land Tenure Center paper no.46)

9. ABSTRACT

10. CONTROL NUMBER

PN-RAA- 814

11. PRICE OF DOCUMENT

12. DESCRIPTORS

Mexico

13. PROJECT NUMBER

14. CONTRACT NUMBER

Repas-3 Res.

15. TYPE OF DOCUMENT

Repar-3

LTC P

June 1968

LTC No. 46

THE LAND TENURE CENTER
310 King Hall
University of Wisconsin
Madison, Wisconsin 53706

INTEGRATING THE RURAL MARKET INTO THE NATIONAL ECONOMY OF MEXICO

BY

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This is a translation of an article which appeared in Comercio Exterior, Vol. XVII, No. 9, Sept. 1967, p. 706. An earlier version of this paper was presented at the Primer Congreso Nacional de Mercadotecnia, held July 21-23, 1966, in Cuernavaca, Morelos, Mexico.

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By

Delbert T. Myren

Until recently, in far too many parts of the world, the rural sector was considered important primarily as a source of foreign exchange through production of export crops. Today it is beginning to be appreciated that the rural sector is important to the nation for three other reasons.

First of all, it is responsible for producing food to provide an adequate level of nutrition for the entire nation. We are constantly reminded of the importance of this task in avoiding an unfavorable balance of payments position through the importation of food.

Secondly, the rural sector has an even more important social aspect in that half of Mexico's citizens live in the rural areas. What they can contribute to the political and social life of the nation is very much keyed to how fully they share in its economic advancement.

Thirdly, the rural sector is the largest area for prospective expansion of the national market. Nearly all of the products produced by industry have substantial economies of scale both in manufacturing and in distribution, and it therefore becomes of great importance to have as large a market as possible for manufactured products.

The Mexican government has made well-placed investments in the development of new technology for modernizing agriculture as well as large investments in the fertilizer industry. Private capital has participated in making available to farmers new products such as insecticides, fungicides, herbicides, and fertilizers, as well as farm machinery. Government price-support programs combined with crop insurance have helped to assure farmers a return on their investment. Large investments in highways and feeder roads have helped to connect isolated farming areas to urban markets. Agricultural extension and credit programs have accelerated agricultural development.

The result of these programs has been agricultural growth which, measured in aggregate terms, has approximated six percent annually--one of the highest rates in the world. It would be no small accomplishment for a country to increase food production as rapidly as its population was increasing. Mexico, however, went from importing 50 percent of its wheat to exporting some wheat while the consuming population nearly doubled. Mexico has also satisfied her corn needs and become an exporter even at a time when modern

poultry and hog enterprises have been consuming rapidly increasing amounts of corn and sorghum. This greater agricultural production continues to be a crucial factor in the industrial development of the country.

But it is still not enough, for by far the larger part of the increase in production has been achieved by only a small fraction of the farm families. The vast majority of Mexican farmers have not participated fully in this growth and consequently do not yet constitute a market for most consumer goods.

The Three Sectors of Mexican Agriculture

In stating the above, we have already indicated some of the characteristics of the rural market. It is not homogeneous. It is made up of a relatively small modern sector, a large traditional sector, and a growing transitional sector. In many cases these sectors exist in the same geographical areas; they are, however, clearly distinguishable. Let us take a brief look at each of them, to gain a clearer understanding of the problems that confront us.

The modern sector, which has contributed most to the agricultural growth for which Mexico has become famous, is located principally, although not entirely, in the irrigated areas. In it, the farmers use fertilizers, improved seeds, insecticides, fungicides, herbicides, and tractors and other farm machinery. They base their production of crops and livestock on market demand and purchase much of the food consumed by the family; thus the crops they grow have little relation to the food they consume. They use bank credit and crop insurance. Many of them live in nearby cities rather than on the farms or in villages, and they commute to their farm land by car or truck. Their children attend primary, secondary, and often preparatory schools, and sometimes go on to college. They live in modern houses equipped with radios, television, and indoor plumbing and their homes are located on paved streets. In Mexico today this commercial-farming sector takes in approximately 20 percent of the farm families. It contains primarily private farmers, with relatively few ejidatarios.¹ Some scholars would

¹ In Mexico as a whole, the ejidos account for more than half of the farm population and about 44 percent of the cropland. Although there are important differences between private and ejido holdings, and the amount of land operated by the individual ejidatarios is on the average less than that for the private holders, what is said in this paper applies in most cases to all small producers, whether ejidatarios or private holders. For a concise review of Mexican land tenure and role of the ejido, see Foreign Agricultural Service, U.S. Department of Agriculture, Land Redistribution in Mexico, FAS-M112 (March 1961).

say that the group is much smaller, but I am including all farmers who sell 75 percent or more of what they produce. This 20 percent includes a high proportion of the farmers in the irrigation districts of northern and northwestern Mexico and perhaps three-fourths of those in the irrigated area of the Bajio. It includes most of the farmers who use the inputs of modern agriculture: fertilizers, improved seeds, herbicides, etc. Only a part of the farms are mechanized. In fact, the 1950 census indicated that less than two percent of Mexico's farmers had tractors at that time.²

In the traditional or subsistence sector, at the other extreme, the farmer usually lives on his own parcel or in a small village nearby. He cultivates his land in much the same way that his father and grandfathers did, with the same rudimentary implements that have been used for centuries. He produces mainly the things that are consumed at home and farms chiefly to subsist. When the harvest is exceptionally good, he may sell a surplus and with this income occasionally enter the market for consumer goods. For present purposes, we may define the subsistence farmer as one who with his family consumes more than 75 percent of what he produces. If he is fortunate, there is a primary school near enough so that his children may attend it while living at home. His own level of education is low: in many cases he is unable to read and write. At the far extreme in this sector are the indigenous families who still preserve the customs and the language of their ancestors. In general, however, the traditional sector is made up of "mestizo" families who for various reasons are barely extracting a subsistence. Both private farmers and ejidatarios are represented in this group. It accounts for perhaps 35 percent of Mexico's farm families.

To the growing transitional sector belong the farmers who are moving from traditional ways to a modern agriculture, from largely subsistence-oriented to market-oriented production. Identifying this group is useful, even if we cannot place precise boundaries around it. We may define the transitional farmer as one who with his family consumes from 25 to 75 percent of what he produces. By this definition, this sector accounts for roughly 45 percent of Mexican farm families. We cannot demonstrate that all of these farmers are necessarily selling a progressively higher proportion of their harvest each year, but only that they are all located somewhere between subsistence and a truly modern commercial agriculture.

²This figure is based on a simple division of the number of tractors (54,537) by the approximately three million farm operators. In reality, the number of farmers who have their land prepared by tractor is somewhat higher, since it is common for tractor owners to do custom work for neighbors. The Ejido Bank also maintains machinery pools in certain areas.

The following discussion will be limited to the traditional and transitional sectors, since the modern sector has already been incorporated into the national economy and is providing a growing market for consumer goods. The development of a broader rural market can only come about through transformation of the large traditional and transitional sectors. In other words, there is not going to be a mass market for consumer goods among 80 percent of the rural population until their purchasing power sharply increases. Such an increase is of necessity a two-step process, and the first step must be to raise the efficiency of agricultural production.

Increasing Rural Purchasing Power

It is true that making consumer goods available and creating a desire for them may result in increased agricultural production by those wanting to buy the goods, especially where there is an existing surplus of labor and an obvious way to use it in agricultural production. But most increases in production and consequently in purchasing power must come through a frontal attack on gaining the adoption of improved farming practices.³ As the purchasing power of the vast majority of farmers is raised, the foundation is laid for a rapid expansion of the market for the products of light industry.

To set this sequence of events in motion, we must first convince ourselves that these changes are within the realm of the possible. There is a great deal of fatalism among both governmental planners and private entrepreneurs in regard to the traditional and transitional sectors. Private firms consider that the level of purchasing power in these sectors is so low that they cannot afford to touch them. Officials of governmental programs point out that their resources and personnel are inadequate to achieve what is expected from the programs and that consequently they must use their credit, crop insurance, and technical assistance where their limited staffs can work with farmers who control a sizeable acreage. The risks, they say, are greater with small farmers, and the overhead is nearly 20 times higher when lending money to 20 farmers.

³ I refer here to ideas as well as products. Most of the new knowledge coming into agriculture is incorporated into manufactured products or seeds by the suppliers of agricultural inputs. Frequently, however, other important yield increments may be obtained through the correct use of these inputs. In the industrialized countries, where labor is in relatively short supply and consequently expensive, many improved practices are of a labor-saving nature. In areas where labor is plentiful, improved practices are usually those that represent substantial increases in yield per unit area. In both cases, the term "Improved agricultural practice" should refer to one that can result in greater profits.

each having two hectares of corn than to one farmer with 40 hectares of corn.

The result of these factors is that the structure of opportunities for the traditional and transitional sectors is indeed inadequate compared to that for the modern sector. The following data from a recent study conducted among private farmers in an important irrigated area in the Dajio suggest that participation in government programs is largely confined to those with the larger holdings:

Table 1. Knowledge and Use of Various Programs in Relation to Farm Size of Private Operators. Alto Rio Lerma Irrigation District, Mexico, 1965.

Participation by Farmer	Number of Hectares Operated		
	5 or less (N = 16) %	5.1 to 25.0 (N = 27) %	25.1 or more (N = 31) %
Has sold corn to the price-support agency	6.3	25.9	71.0
Has used either government or private bank credit for planting corn	6.2	29.6	58.1
Has used crop insurance	12.5	44.4	80.6

As a group these farmers, all with irrigated land, are more prosperous than the average for Mexican farmers: only 27 percent of them would fall into our categories of traditional and transitional. Yet even within such a group we find these sharp differences, by size of farm, in extent of participation in three public programs of key importance for raising agricultural production.

The banks give preference to the larger operators and to the irrigated areas where there is less risk of crop failure. The crop insurance agency cooperates by insuring these loans, and the price-support agency purchases the harvest. Those who do not get credit from the agricultural banks generally do not participate in the other two programs. The result is a type of circular causation that further benefits the present modern sector but is of limited use to the sectors which we want to bring into the market economy.

Nevertheless, it would be unjust not to mention the strong interest of the government in stimulating development of the retarded sectors. Ing. Ricardo Acosta, Subsecretary of Agriculture, has described it aptly:

To increase farm income, it is necessary to channel development programs directly to the small producer in a broad, determined, and energetic manner. The recipients must be the true small landowners and ejido members and those in depressed areas, in preference to those in more favored positions; technical assistance programs and infrastructural works must also be made available. To achieve better distribution of farm income, we must make sure that the commercial protective policy, credits, and in general, any financial aid be channeled solely to benefit authentic small landowners and ejido members.⁴

Suppose we accept that attention should be given to these two sectors. We still need to be convinced that development can actually be brought about in them, that they can become a viable part of the national economy, and that rural incomes can be raised. The situation is not nearly as hopeless as is commonly believed; the reason is found in the changed nature of agriculture.

In the active period of the Mexican Revolution, and before, land was not only wealth and the symbol of authority and power, it was also the main source of future wealth. Thus, it was a realistic hope that, by redistributing the land, income could be effectively redistributed and economic liberty and social equality be attained. The success of the Revolution undoubtedly laid a part of the groundwork for Mexico's industrialization.

There is perhaps only one way in which the Mexican campesino has found disappointment in his new right to the land: it has seldom been the source of wealth that he expected. Though he has a piece of land on which to subsist, he has found it a poor source for creating more wealth. The reason, of course, is that he has continued to farm with the traditional low productivity methods that he practiced under the hacienda.

The Promise of Modern Agriculture

Today there is a chance to break out of this traditional poverty. The opportunity is presented by the nature of modern

⁴Ricardo Acosta, "Agricultural Productivity," in Round Table on Rural Development, sponsored by the National University of Mexico and the Advertising Council, Inc., 1965.

agriculture. Although the big tractor is widely accepted as the symbol of modern agriculture, the true essence of "modern" is in reality more chemical and biological than mechanical. The new technology is chemical fertilizers, insecticides, fungicides, and herbicides; it is new disease-resistant and higher-yielding varieties; it is antibiotics to control diseases and help animals produce more efficiently; it is the products of this new technology with which it is possible to double, triple, even quadruple production with the same amount of land and the same amount of labor.⁵

It is true that a small number of the larger private farmers have been the first ones to recognize the potential of this modern agriculture. But my point is that there is nothing intrinsic in the use of these new inputs that must keep the small farmer, currently in the traditional sector, from adopting them.⁶ There are no significant economies of scale in either their purchase or utilization. Most can be purchased in small units and can be applied as well by hand or with hand-powered equipment as by machine.

I frequently hear the argument that the first move must be to get the excess population off the land, to the better paying jobs that should be waiting for them in urban industry. Then the small land holdings could be consolidated into farms that could be efficiently worked with heavy machinery, thereby attaining greater production at the same time that rural poverty is eliminated. If it were only that simple! Unfortunately, the creation of so many better paying jobs in urban industry is not going to happen by simply wishing it. During the past decade Mexico enjoyed rapid industrial and urban growth, yet rural population continued to increase.

Mexico's population growth rate at 3.5 percent is a startling phenomenon that is going to double population once again in the next 20 years. Not all of the additional 40 million people are going to be able to move to industry, so that there will probably

⁵ Indeed, to obtain maximum yield increases it is frequently necessary to weld together a number of individual components to form the most productive and profitable system of practices. For an excellent illustration of this point, see Sterling Wortman, "The Crop Production Equation," presented at meetings of the Weed Society of America, February 1967 (mimeo.)

⁶ It must be acknowledged, however, that there are pockets of rural poverty which, because of topography and inadequate rainfall, cannot easily benefit from these modern inputs.

be a greater rural population in 1986 than there is right now.⁷ Our hope for feeding all of these people and for increasing the income of those who do the farming is to transform the traditional and transitional sectors into modern agriculture. But we need not start with the premise that labor is the scarce factor in a modern agriculture. During a transitional period, at least, there is no reason why we cannot use abundant labor within the process of modernization. Japan and Taiwan have provided remarkable demonstrations of this approach.

Let me give an idea of what one technological change may mean for the individual farmer and for the rural market.

The Miracle of Chemical Fertilizer

One of the truly dramatic changes in Mexican agriculture has been the use of chemical fertilizer, especially nitrogen. Twenty years ago the use of chemical fertilizer was virtually unknown. In 1964 the total use was 268,058 metric tons of elemental nitrogen, of which 146,365 tons produced in Mexico and 121,693 tons imported. By 1970 it is estimated that agriculture will be using between 419,000 and 630,000 tons of elemental nitrogen a year, all of it produced in Mexico and having a value of some 2,000 million pesos MN.⁸ The area making use of fertilizer is expected to increase from 1.8 million hectares in 1960 to 5 million hectares or about one-third of the harvested acreage in 1970.

Let us play with figures for a moment and see what this fact alone may mean in available income in the rural sector. Laird and

⁷ In their Proyecciones de la Población de México 1960-80 (Mexico City, 1966), Raúl Benítez Zenteno and Gustavo Cabrera Acevedo offer two possible projections of rural population, one based on a growth rate of 1.5 percent annually, similar to that observed for 1950-60, and the other on a rate of two percent. They explain that the rapid decrease in mortality up to 1960 occurred principally in the urban population and that in the future the decrease in urban mortality will probably be slow while a more rapid decrease in rural mortality may be expected, which will little by little reduce the difference between the two. Consequently, instead of a reduction in rural population, there will probably be an increase of five to seven million by 1980. There is, of course, the possibility that a change in attitudes toward family planning may alter this projection. However, the present rate of growth in awareness of population increase as a problem leads me to believe that the projected increase will not be notably affected during the next 15 to 20 years.

⁸ Data of the Industrial Programming Department of the Nacional Financiera, S.A.; also published by Fertilizantes del Istmo, S.A., in La Industria de los Fertilizantes en México (Mexico City, 1966).

Rodríguez have calculated the total cost of using nitrogen at \$5.16 MN per kilogram.⁹ Under relatively unfavorable conditions they have obtained nearly four pesos' return in corn production for every peso invested in nitrogen. If on the average a similar response were obtained for the additional 300,000 tons of elemental nitrogen that it is predicted will be consumed, the total cost of the additional nitrogen would be about \$1,500 million pesos and the additional income in the rural sector would approximate \$6,000 million pesos. If only two pesos were obtained for each additional peso invested in fertilizer, the additional income would approximate \$3,000 million pesos. Such calculations, of course, are based on constant prices for the grain that may not prevail with increases in supply of the level projected. Nevertheless, with the world-wide shortage of food grains that is developing, it is probable that prices would stabilize near the present world market level, or at about 20 percent below present levels. Lower prices could be offset by a reduction in price of fertilizer as national production facilities began to produce more efficiently.

These figures are only for the use of nitrogen fertilizer. In many areas of the country phosphate fertilizers also give substantial increases, and other increases are being obtained through the use of herbicides, insecticides, fungicides, and improved seeds.

For the individual small holder the projections are modest but equally striking. If the ejidatario with five hectares of corn applies 120 kilograms of nitrogen per hectare, he will apply a total of 600 kilograms. If the use of nitrogen costs him \$5.41 pesos per kilogram (\$4.58 for the fertilizer, \$0.10 for transporting it to the field, \$0.25 for applying it, and \$0.48 for harvesting, shelling, and transporting the increased yield to market), the total cost of applying this fertilizer will be \$3,246.¹⁰ If from this application he receives an increase in

⁹R. J. Laird and J. Horacio Rodríguez G., Fertilización de maíz de temporal en regiones de Guanajuato, Michoacán y Jalisco, Folleto Técnico No. 50, Instituto Nacional de Investigaciones Agrícolas, S.A.G. (Mexico City, 1965).

¹⁰If anything, this figure errs on the side of understatement. The fertilizer cost was calculated for ammonium sulphate, usually the most expensive form because of its low concentration (20.5 percent N). To the wholesale price of 690 pesos per ton was added 50 pesos for bags, and a 20 percent retail markup. In addition, 50 pesos have been added to the figures of Laird and Rodríguez to cover transportation from the wholesale point to the retail outlet. The other \$0.10 for transportation is based on 20 pesos per ton for hauling ammonium sulphate an average of 20 kilometers from the retail point to the farm. The \$0.25 for application is based on one man at a normal farm salary of 15 pesos per day applying 60 kilograms of N in one day.

yield of 2.64 ton/ha., as Laird and Rodriguez did on the average, he will have an additional 13.2 tons of corn at harvest with a total value, at 800 pesos per ton, of \$10,560.¹¹ Deducting the cost of using the nitrogen, this leaves \$7,314 of additional income, or additional purchasing power for this farm family.

When this happens, the marketing of consumer goods can be discussed in the more common and limited framework of consumer preferences. Then the farmer will have sufficient income to be faced with such decisions as whether to spend it on a radio, sewing machine, shoes, toys, toothpaste, or shaving cream, and whether to buy this brand or its competitor.

Breakthroughs Needed to Integrate the Rural Market

So, is it such a wild dream, as some people say, to think of integrating the rural market into the national economy? My contention is that it is not quite so fanciful as the dreams of those who 20 years ago were thinking of flights in outer space or transistor radios.

However, it is going to require some breakthroughs of the same magnitude; breakthroughs that will only come if someone believes they are possible and invests money and highly skilled personnel in the job.

The experience of Japan, and more recently Taiwan, suggests two of the components: universal primary education and effective farmer organizations to carry out functions that individual small operators cannot perform effectively.

We especially need a breakthrough in ways of efficiently channeling knowledge, credit, and modern production inputs to a vast number of small farmers. The cost of paperwork for extending credit is much too high. The communication of knowledge through our technical assistance programs is much too costly. There must be a way to include more small producers--private operators and ejidatarios--and especially more of those on unirrigated land, in the crop insurance programs; they are the ones who need security the most because they are exposed to the greatest amount of risk and uncertainty when they try anything new. The needs that we are talking of here are not the result of bad will on anyone's part. Rather they are tough problems for which truly creative

¹¹The corn harvest is calculated as dry shelled corn at 15.5 percent moisture. Although the support price at the time of data collection was 940 pesos per ton in all of Mexico, and continues to be except in the irrigated areas of the north and northwest, a figure of 800 pesos has been used here to allow for farmers who are far from collection points and therefore not able to benefit fully from the guaranteed price.

Innovation is needed if the majority of farmers in the rural sector are to be incorporated into the national economy.

By the same token, private initiative must begin to believe that it will still be here five or ten years from now and start to make more long-term investments. At present, the availability of many of the inputs of modern agriculture is a very relative affair. Fertilizer is available in the Yaqui Valley, where eight or ten companies compete to see which can give the best credit terms and apply the fertilizer directly on the farmer's land. However, the small farmer in much of the country lives isolated from salesmen of modern production inputs. If he finds out about fertilizer through the experience of a neighbor, he may take the bus to the nearest city where fertilizer is sold. But there he usually finds that he cannot get credit because the store owner does not know him. After trying the banks, he goes home. Or if he is not yet ready to give up, he goes to a local moneylender whose rate usually runs to five percent a month. Is fertilizer available? Yes, but not easily available. Although the costs and returns per acre are not as high for many of the other inputs of modern agriculture, the picture has similarities.

Once again the problem: how can a low-cost distribution system be worked out that will make the inputs of modern agriculture available throughout the Republic?

In regard to the distribution of knowledge, the prospects for a breakthrough are better than ever before. A multimillion-peso road-building program is rapidly linking the entire country. Agricultural scientists and extension agents can rapidly enter regions that were effectively isolated a few years ago. These same roads are making it possible for the farmers themselves to travel to other areas and observe new methods of farming. On the mass communication side, a breakthrough in the design and manufacturing of the transistor radio has opened a vast new field of communication. Nine years ago, when we were discussing a pilot project to determine the potential of radio for communicating information to farmers, we had to be concerned not only with transmission and content but also with how to obtain the necessary receivers. The project was never started, but in the short time since then the receiver problem has been taken care of. In many ejidos and rural villages today nearly half the farmers have radios. When there occurs a technological breakthrough of this type with television--low-cost sets not requiring generators or rural electrification--we may see the elimination of illiteracy on the horizon.

Conclusions of

We are much closer today than we were 20 or even 10 years ago to the possibility of integrating the rural sector into the national economy. However, it is a task where help is needed. We cannot be satisfied with integrating a larger share of agricultural production; for all kinds of reasons our goal must be to integrate a larger share of the rural population into this modern world. A great many rural families have still to take their first tentative steps toward modernization, and chance will not move enough of them far enough or quickly enough to meet the demands of the times.

The first thing we must do is to discard, once and for all, the idea that modernization must wait upon mechanization of agriculture. That idea emerged from another time and climate, when land was relatively abundant and farm size (and, indirectly, family income) was limited only by the acreage one family could manage and operate. There, mechanization was a priority and, in fact, the essence of modernization.

Fortunately, modernization does not have to wait upon mechanization. Whole new vistas open up if we recognize that where agricultural land is relatively scarce and rural labor abundant we can begin to modernize through a wholly different group of inputs: improved seeds, fertilizers, pesticides, and other cultural practices. If governmental and private agricultural agencies find the ways to make these inputs readily available to small farmers and provide credit, technical assistance, and insurance against undue risk, this will effectively offset the advantages that larger farm units now enjoy in applying new technology. When we can find a way to perform these tasks well, we can hope for large and immediate strides in modernization for a great many rural families.