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THE MIDDLE-SIZED FARM IN GUATEMALA

by

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THE MIDDLE SIZED FARM IN GUATEMALA

by Lester Schmid

Introduction

A growing sector of small farms in Guatemala raises crops and livestock products for sale rather than solely for consumption, even though the national agriculture is characterized by a large-scale, capitalistic, export-oriented farm sector and a small to very small-scale, traditional, family-oriented sector. A majority of the latter subsistence farmers must seek work on the large farms in order to obtain money for the purchase of non-food necessities, and in cases where not enough corn and beans can be grown, for the purchase of these staple foods.[1] However, in some regions very few of the small farmers are forced to engage in migratory work despite the predominance of small farms in these areas. Though non-agricultural employment may be an important factor in a few areas and in individual cases, the most important factor allowing decreased dependence on migratory work appears to be a less traditional agriculture in these regions. The non-traditional aspects involved consist of the choice of crops or livestock produced, the methods of production used, or a combination of these. The present study attempts to determine how these farms have developed, how well they provide reasonably full employment for the farm family, and how they earn incomes that allow

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[1]Lester Schmid, "The Role of Migratory Labor in the Economic Development of Guatemala," Ph.D. thesis, University of Wisconsin, Department of Agricultural Economics, 1967.

the farm family to live healthfully, educate their children, and progress in other ways--all without hiring a considerable amount of outside labor.[2]

If a large proportion of Guatemala's subsistence farms could be transformed into such commercial family farms, a profound effect upon the national economy would result. First, the transformation would increase the welfare of the farmers themselves, who comprise a large

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[2]The concept of the family farm used here is more or less that employed in the United States; that is, a farm which furnishes to the farm family an income approximately equal to that which it could earn in other occupations, and also furnishes full time employment, with labor hired only for peak periods of activity.

For many years Guatemalans have wanted to encourage family farms, but they seem to hold conflicting concepts of family farms. For example, President Justo Rufino Barrios sold and gave away land in parcels of 110 to 550 acres to create "family farms," then forced indians off their communal lands in order to furnish laborers to these farms. Here the concept of family farm appeared to be a farm which could be operated with hired labor while the owner lived in the capital and which would furnish an income enabling the owner and his family to live without working.

On the other hand, the government has occasionally sold or given land to landless campesinos in very small plots (Ubico ceded plots of 3.5 acres), as "family farms"--farms on which a farm family could produce enough corn to sustain the family. Thus at least two concepts of the family farm, one applying to the comparatively wealthy and the other applying to the poor, have already been tried in the past. The definition is partly a question of technology, since hand tools can scarcely till enough land to provide a satisfactory income to the farm family unless crops are planted which produce a higher value product per land unit than corn.

The national planning commission at present uses a concept which agrees fairly well with the concept applied in the United States: that the family size farm consists of "the area of land which in accord with the conditions of each zone would be sufficient to assure an adequate subsistence and progress of the farm family, with relation to its average composition, and by means of an integral application of the work of its components in this area."

proportion of the population of the country. It would do this by directly increasing their incomes and by reducing their need to find migratory work, in which living conditions are generally even poorer than in their home communities and wages are low. Indirectly, this decreased supply of workers would increase wages and improve conditions of work in the export sector and perhaps in other sectors as well.[3]

Second, insofar as the cause of this transformation was the use of yield-increasing inputs (and was not the consolidation of small farms into larger land units or the use of labor-saving machinery), both agricultural and secondary employment in the home community would be increased, thus slowing migration to the cities and braking urban unemployment.

Third, the increased production of food and other goods supplied by this sector will reduce the real cost of these products for workers in the non-food producing sectors, thus preventing increases in the money wage of the workers, and therefore tending to maintain profits and investment in this sector.[4]

Fourth, as the incomes of the farmers increase, the demand for non-farm products will rise also. To the extent that this demand can be satisfied by the non-farm sector within the country,

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[3] W. Arthur Lewis, "Economic Development with Unlimited Supplies of Labor," The Economics of Underdevelopment (Bombay, India: Oxford University Press, 1958), p. 433.

[4] Ibid.

non-farm employment will be stimulated, relieving unemployment problems in urban areas. Since about two-thirds of the gainfully employed of Guatemala work in agriculture, the largest potential market for non-farm products lies in this sector. As Lewis has said, "If there is balanced development with the productivity of farmers growing rapidly and the demand for manufactures correspondingly increasing, there is ample scope for investment in industry."[5]

Fifth, insofar as the expanded agricultural production is exported rather than consumed within the country, further development of this sector will tend to reduce balance of payments problems.

This study does not directly deal with the typical small and medium sized farms in Guatemala. In fact, the sample was deliberately chosen to represent the farms which produce other than the subsistence crops characteristic of the small to medium sized farms. Because of the heterogeneity of Guatemalan agriculture, the farms chosen should not necessarily be considered representative of the modernizing farm. Interviews were conducted in only 17 communities. Several more regions were visited, but for various reasons were not considered appropriate for the study. One hundred seventeen fairly complete interviews were made. For various reasons, the same number of interviews was not conducted in each community.

The appendices briefly treat the background of Guatemalan agriculture, the characteristics of the studied communities, and the selection of communities and interviewees.

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[5] W. Arthur Lewis, The Theory of Economic Development (Homewood, Illinois: Richard D. Irwin, 1955), p. 141.

Results of the Interviews

Income

Total net earnings from crop production of the 117 interviewed farmers were estimated at $160,000, with a per family average of $1,368.[6] The highest average incomes were encountered in Teculután, Monjas, San Bartolomé, Milpas Altas, and Jocotillo, and the lowest in Chiantla, Pajco, and Santiago S. Net earnings per family in the indigena (Indian) regions averaged less than one-third net earnings in the ladino ("non-Indian") regions. One third of the ladino farmers and nearly three-fifths of the indigena farmers earned less than $400 annually from crop production.

Net earnings from livestock production of the 117 farmers were estimated at about $18,400, with two-thirds of this earned in Montufar. Even excluding Montufar the ladino farmers earned much more than the indigena farmers from this source.

Nearly one-half of the farmers received some income from other sources, earning a total of about $34,000. Nearly one-half of these farmers lived in three communities near the national capital--Palencia, Santa Elena Barillas, and Jocotillo. The most common source of additional income was storekeeping.

For the farmers as a whole, 75 percent of total income came from crop production, 9 percent from livestock production, and the remaining 16 percent from non-agricultural activities. However, there were large differences between farms and between regions in the proportions of income from each source.

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[6] All monetary figures are given in U.S. dollars. One U.S. dollar equals one quetzal, however.

In spite of efforts to interview small farmers with somewhat higher than average incomes, one-fourth of the ladino farmers and over one-half of the indigena farmers interviewed had crop plus livestock incomes from farming under $400, while slightly over one-third of the ladinos and only six percent of the indigena farmers earned more than $2,000 per year from farm activities.

When total income, farm plus non-farm, is considered, about 15 percent of the ladino families and 42 percent of the indigena families had annual incomes of less than $400. The proportion of those with total annual incomes of $2,000 or more was 41 percent among the ladinos, but only 12 percent among the indigenas.[7]

The indigena farmers lived in the village somewhat more commonly than did the ladinos. In Santa Elena, Almolonga, Zunil, Pajco, and Santiago S., all or a majority of the farmers lived within the village and commuted to their land. Some of the indigenas rented land as far away as 300 kilometers.

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[7]For comparative purposes, each ethnic group was divided into three income groups: 1) lowest incomes--less than $400 per year; 2) middle incomes--$400 to $1,999 per year; and 3) highest incomes--$2,000 or more per year. These income groups have quite broad ranges, but with the limited number of cases division into more groups proved unsatisfactory. The groups can be characterized as follows. The lowest group earns scarcely enough from all sources to properly feed and clothe the family. The middle group--especially near the upper limit--earns considerably more than the average rural family and can generally make some progress. The highest group, especially those earning more than $4,000 per year, can live in comparative comfort. Later discussions will refer to and compare income groups in this context. At times the study will also consider an income group for the sample as a whole--both ethnic groups taken together.

When crop production is discussed, these income grouping refer to net crop income only. When total farm production is discussed, these groupings refer to net farm income. When the effects of income on consumption are concerned, the groupings refer to total income--farm and non-farm.

It was impossible to determine what effects the number of plots farmed had upon income. However, from comments of the farmers interviewed, one can conclude that farming a number of scattered plots (rather than farming the same amount of land in one contiguous piece) increased the amount of time needed to guard the crop against insects, diseases, predators, and thieves. Scattered plots in some cases also increased losses from imperfect timing on the farm operations, and made mechanization more difficult in those instances where mechanization would otherwise have been feasible. These effects apply especially to those indigena farmers who rented land far from their home community--the time required for travelling back and forth and the bus fare paid both for the farmer and his product absorbed much time and money.

A somewhat higher proportion of the ladinos possessed titles to their land than did the indigenas. This difference probably reflects the generally larger size of the plots owned by the ladinos and the complete lack of titles to the communal land among Pajco and Chiantla indigenas, who worked a sizeable proportion of the total land farmed by indigenas. Within both ethnic groups, the farmers had titles for a slightly higher proportion of purchased plots than they did for inherited plots.

Whether or not farmers had titles to land appeared to make little difference in productivity. Apparently farmers were less likely to hold titles to land of less value, such as found in Pajco and Chiantla. Where a lack of titles has resulted in disputes over land ownership, as in an uninterviewed community not far from Pajco, some

effect upon production would seem to occur. Thus, even though absence of titles did not appear to affect production among the interviewed farmers, the potential for these effects does exist.

The price of land was more closely related to land scarcity within the community than to land productivity. In all of the indigena communities except Pajco and Chiantla, land values ranged much higher than in the ladino regions. The amount of rent paid also appeared to be related to the scarcity of land rather than to its productive capacity. Generally rent per hectare, as with purchase prices, was highest for the smallest plots; the small plots were concentrated in the indigena regions where land is most scarce. However, rents paid per hectare by farmers with one to five hectares of land were the lowest, apparently reflecting the quality of the soil.

In many communities absentee landlords profited greatly from the activities of the interviewed farmers. One of the places where this was most evident was the municipio of San Juan S., where much of the land planted to flowers was owned by people living in the town of San Juan S. or in the capital city. Some small valleys here were said to be owned by one person; in this case the owner of but 30 hectares (74 acres) would have a rent income of $6,000 at the average rental value of $200 per hectare, with little expense to him (few pay the land tax of $3 per thousand of assessed valuation). One of the renters in this community volunteered the information that rents were adjusted to give the renter a return equivalent to that of hired labor, or about 55 cents per day. However, the renters interviewed in this region apparently earned about double this amount if no labor was hired; more if labor was hired at a lower rate.

In those cases of sharecropping in which the owner furnished the land and nothing more, and the crops were corn and beans, the returns to the sharecropper were meager. On the other hand, where crops other than corn and beans were grown and the owner paid 50 percent of the fertilizer, seed, soil preparation, and transportation costs, the return to the sharecropper was somewhat above that of hired labor. For tomato growing in Teculutan, it was calculated that a sharecropper could earn about $2 per day, as opposed to the 75 cents to $1 a day paid to hired labor. Though the owners obviously exaggerated when they claimed that the sharecroppers were capitalists, it was evident that sharecroppers earned somewhat more than did hired labor.

Farming Practices--Crops

A total of 1731 hectares of land was owned or operated by the interviewed farmers. Of this total, nearly 800 hectares was good soil according to the interviewed farmers. Most of the 914 hectares of dry or poor soil was located on one farm in Teculutan; about two-thirds of the soil subject to flooding was owned by a farmer in Monjas, but this land was located on the Pacific coast.

About 466 hectares (27 percent) of the land on the farms of the interviewed farmers was cultivated--about 60 percent in the indigena regions, versus about 24 percent in the ladino regions (or 40 percent if exception is made for the one unusual case in Teculutan). None of the six ladino farmers with less than one hectare of cultivated land had net crop earnings of more than $400, whereas 8 of the 13 indigena farmers with less than one hectare did

have net crop earnings of more than $400. In both ethnic groups, none had net crop earnings of more than $2,000 from less than two hectares of cultivated land.

Despite the general conclusions one may draw from these figures about possible earnings on very small farms (less than two hectares) earnings per hectare obviously differed widely. Gross value product per hectare also varied greatly from one region to another, from $95 in Chiantla to $3,300 in Almolonga.

The costs of farm equipment, buildings other than homes, and trucks (depreciation) absorbed about three percent of the gross value product of the ladino farmers, but only 0.1 percent among the indigenas. Variable capital costs accounted for about 11.5 percent of the gross value product for both ethnic groups, though this percent varied from 2.4 percent in Jocotillo to 25 percent in Monjas. The average value product net of all capital costs was $472 per hectare for the ladino group and $513 per hectare for the indigena group, a difference of about $40.

The few comparisons possible between levels of fertilizer use on the same crop indicated that one of the reasons for higher values per hectare on some farms was higher fertilizer use. Apparently greater use of insecticides and fungicides on some farms also contributed to higher yields and a higher net value product.

One reason for higher crop yields on the smaller farms was a higher multiple-cropping ratio. There was much less variation in the net value product per hectare <u>planted</u> than there was per hectare

cultivated among farm size groups measured by size of cultivated area. Little difference between the ethnic groups was noted in this regard.

The proportion of land planted to corn, as opposed to higher value crops, was one of the reasons for differences in value product per hectare. The net value product per hectare for corn in the ladino areas was $90, compared to but $57 in the indigena areas despite the high values in Aguacatan. Net value of production for all crops other than corn is $200 higher per hectare in the indigena areas than in the ladino areas. If equal proportions of corn and other crops had been planted in both areas, the difference in net value product would have been about $90 in favor of the indigena regions.

Farmers who rented some land in addition to land which they owned generally used more fertilizer per hectare and also had considerably higher gross value products per hectare. Cash rent accounted for about six percent of gross value of production on the land which was rented, with a range of one to fifteen percent.

Farming Practices--Livestock

In every community some of the interviewed farmers owned chickens and hogs, and in all but two communities some interviewed farmers owned cattle or horses. More than $70,000 worth of livestock was owned according to the farmers' own estimates--the value of poultry was more than $2,000, of hogs more than $3,000, of horses more than $7,000, and of cattle more than $56,000. Most of the value of poultry was in Montufar, Jocotillo, and Palencia. Hogs reached greatest importance in Montufar, Aguacatan, Jocotillo,

Palencia, and Ovejero-Monjas. Most of the cattle and horses were owned by the farmers interviewed in Montufar; with Teculutan, Jocotillo, and Milagro-Cuyuta considerably less important than Montufar, but still having more cattle and horses than any other regions, where numbers of these livestock were quite small. Nearly $900 worth of sheep and goats were owned by the farmers interviewed in Aguacatan, Chiantla, and Zunil. Certain farmers also owned about $600 worth of other animals, mostly bees. The number of animals owned by each farmer was small except in Montufar, and in a few other individual cases in other regions.

Seventy farmers produced eggs for consumption or sale. Annual egg production per hen was estimated at 80-90 eggs, worth about $4 to $5. Chickens are generally fed only in the dry season; they are expected to live on insects and grass during the rainy season. The death rate for both young chickens and hens appears high, making production unprofitable in many cases.

Sixty-three farmers reported owning hogs; most of them had only a few. Estimates were made of the amount of sorghum or corn consumed by the hogs, but observation indicated that hogs were often fed leftover tortillas which were divided among the dogs, chickens, turkeys, and cats also; therefore, the estimates are not likely to be very accurate. About one-half of the farmers who owned hogs reported net losses, though the amount of these losses was less than the gains for the rest of the farmers. Judging by the appearance of the hogs encountered, one-half or more of the hogs would probably not return to the owner the value of the corn fed, especially when corn is valued at $0.04 per pound as it was in 1967. Most of the hogs were a small

criollo (local) type infested with external parasites, and very likely internal parasites as well. However, in Montufar some hogs were fed whey and belonged to larger breeds.

Cattle were reported in 14 of the regions. In many cases, especially in the altiplano, the farmers owned only one or two animals. These grazed on the grass along roadsides or on rough land, but sometimes feed was cut and carried to them. In most of these cases the goal seemed to be sale of the animal at the end of a few years rather than milk production. In Montufar, cows were kept for milk production; however, the raising of beef is given priority there too. Many of these herds have some Brahma blood, breeding which also indicates that beef production is the primary consideration.

Average annual production of milk per cow was about 1200 pounds. This output appears very low. However, much milk is fed to calves, the cows are not fed well during the dry season in most cases, and they are milked but once a day.

Employment and Returns to Labor

On the whole, crop production in both the ladino and indigena regions utilized about 40 percent of the available family labor supply with animal production taking another five percent. Another five to seven percent was utilized for making firewood and two to three percent in selling farm products. About 16 percent was utilized in non-farm work among the ladino farmers, and six percent so used among the indigena farmers. Overall, 60 to 65 percent of the available family labor time of the farmers was occupied in economic activities.

The farm of less than one-half hectare of cultivated land furnished about 110 man-days of employment for the farm family in crop production, compared to about 280 man-days for the group with 5 to 10 hectares of cultivated land. The latter group hired more than 60 percent of its labor requirements for crop production, compared to only 41 percent hired by farms with 0.5 to 5 hectares of cultivated land and 56 percent hired by the smallest farms. Except for the latter group, farms with more cultivated land generally hired a greater proportion of their labor. A somewhat higher family labor force was available on the larger farms, and about 40 percent of this labor was utilized in crop production, compared to but 30 percent on the farms of less than one-half hectare.

Apparently then, much of the family labor supply available on the farms was not utilized. There were several reasons for this. First, the smallest farms were too small to fully occupy the farm family. Second, on the larger farms, the farm operator had enough income that he did not need to work physically--he could only save a very small fraction of his expenses by doing more work himself, since wages are very low. Third, in many cases the farm operator could earn more than farm wages in other activities; therefore he hired farm labor and engaged in other work.

Furthermore, farm work is seasonal so that surplus labor can exist during part of the year and yet labor must be hired for other periods during the year. If this were a major factor one would expect the farm labor force to be more fully occupied where multiple cropping is practiced under dry season irrigation. However, because of the other factors mentioned and the small number of cases in each region, it could

not be determined whether the family labor force was indeed more fully occupied where the crops were irrigated. Apparently the principal reasons for using hired labor, rather than family labor, are the opportunity to earn more in other activities, or the desire for leisure rather than work when the farm operation is large enough to afford it.

Farmers with a larger family labor supply tended to cultivate more land, perhaps because of a greater need, perhaps because the greater family labor force made it easier to work more land, or possibly because higher incomes resulted in larger families.

The wives of the farmers worked for the most part at household activities and generally tended the hogs and chickens; a few participated in the selling of farm produce. Other work, mostly storekeeping, was undertaken by 17 of the farm wives.

Most farmers hired labor for crop production, even those on small farms which did not furnish full employment to the farm family. However, more than one-half of the total labor hired for crop production occurred in three regions--Teculutan, Jocotillo, and Cuyuta-Milagro. Little labor was hired for livestock production, with 80 percent of the total of such labor hired in Montufar and Teculutan.

Total wages paid to labor amounted to $37,500, with $32,000 of that paid in the ladino regions. Wage rates averaged 81 cents per day in the ladino regions and 53 cents per day in the indigena regions. Total wages paid per hectare of land were greatest in vegetable, garlic and sugar cane production in the communities of Almolonga, Aguacatan and Cuyuta-Milagro respectively.

The larger farms paid the highest average wage rate--88 cents per day on farms of 20 to 50 hectares--as compared to 58 cents per day on farms of under one-half hectare. Farms were largest in those regions in which wage rates were highest, yet the wage rate was almost equal on small and large farms within the same region. In total wages, the small farms tended to pay the most per hectare because of the intensive nature of production on these farms.

On the whole, about 60 percent of the total labor was hired, with a considerable difference between the indigenas and the ladinos--the former hiring 44 percent of their labor requirements, and the latter 66 percent. Generally, on the smallest farms the family furnished a higher proportion of the labor; on the largest most labor was hired. However, some small farms hired most of their labor requirements, in some cases because of the farmer's age or because he was engaged in other work. On the other hand, four families in the 10 to 50 hectare farm size group furnished most of their labor requirements, primarily because many children or other family members lived on the farm.

An average of about 135 man-days of total labor (family and hired) per crop hectare were used in the ladino regions, and about 250 in the indigena regions. The difference was widened by the extremely large amount of labor used in Almolonga. The number of man-days of labor used per hectare was vastly greater for the farms with less than 0.5 hectares of cultivated land; the 5 to 10 hectare farms used the least labor per hectare.

The amount of labor required for crops other than corn varied from 47 to 60 man-days of labor for sorghum production up to 800 to 2880 for

different types of flowers, much of the great differences owing to the daily watering necessary with some types of flowers. For corn, production with hand tools alone used 80 to 115 man-days; with the use of oxen for some of the work 50 to 90 man-days; and with a tractor 20 to 35 man-days.

Farms of the type operated by the interviewed farmers are an important source of employment within the communities for the landless rural people or those with minute quantities of land, and in a few instances for those from outside of the community. On the whole, the interviewed farmers employed 50 percent more labor (including family labor) than if only corn had been produced. This percentage varied from 36 percent in the ladino regions to 160 percent in the indigena regions. Compared to the major export crops, coffee and cotton, the farms included in this study furnished about 30 percent more employment than the coffee farms and about 60 percent more than the cotton farms on a per hectare basis.[8]

Thirteen farms produced net incomes of $1,000 or more with 50 percent or more of the labor requirements being met by the farm family. Nine of these farmers had net incomes of more than $2,000, one of the nine having an income of nearly $4,000, and one nearly $5,000. These 13 farms came closest to fulfilling the family farm concept of furnishing a reasonable income to the farm family without excessive use of hired labor. Two farms hired no labor but both

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[8]Data concerning labor requirements on coffee and cotton farms is from Schmid, op. cit.

produced over $2,000 net income. Seven of these 13 farms were partly mechanized but six were not.

Little difference was found between the ladino and indigena regions in the proportion of net farm income attributable to labor and management. The return to land, calculated on the rental value of the land, accounted for a greater proportion of the net incomes of the indigenas, but was balanced by the proportion accounted for by return to machinery and other fixed assets of the ladinos.

If paid the prevailing wage for each region, family labor would account for only about 14 percent of the net earnings to labor and management for the farmers as a whole. The proportion was somewhat greater for the indigenas, about 24 percent, and slightly less for the ladinos, about 12 percent. The value of family labor expended on the farm accounted for about one-third of the earnings to labor and management for farms from 1 to 5 hectares in size, this proportion being slightly less for the smaller farms and considerably less for the larger farms.

Alternatively, if one assumed no return to management but only to labor, the average returns per man-day would be $2.32 for the farmers as a whole--$3.00 for the ladinos and $1.56 for the indigenas.

Despite higher returns to land, returns to labor and management per hectare were greatest for the smallest farms, largely because of high value product on these farms but also partly owing to an increasing cost of fixed assets on larger farms up to 20 hectares.

Returns per man-day of family labor were directly related to the proportion of labor hired; that is, the groups with the largest

percentage of labor hired had the highest returns per man-day of family labor. When returns per man-day of all labor are considered, however, this relationship does not appear, indicating that family labor used to supervise hired labor earns more than if employed doing physical work.

When labor expended in livestock production is considered, returns per man-day are roughly comparable to those in crop production. In those few instances where returns per man-day of family labor are high, returns per man-day of total labor are much less.

Earning opportunities in other occupations generally did not appear much more lucrative per man-day worked than farm employment, except for a few exceptional cases such as a labor contractor and a restaurant operator in Chiantla, a storekeeper in Escuintla, and a fertilizer dealer in Aguacatan. Making of firewood appears to be worth about $1 per day, which explains why some farmers make it themselves, while others hire it made and still others buy it--apparently a fairly high proportion can earn more than this working on their own farms.

The data indicate that the principal means to increase income on the part of the farm operator are working more land or intensifyin production by hiring more labor, since labor is generally more productive than its cost. Though there is some difference in the productivity of labor among farms, this factor would appear less important than the amount of labor hired in terms of income to the farm operator.

Marketing

Perishable crops, of course, are all sold at harvest. About two-thirds of the farmers who produced non-perishable crops for sale stored them for a time before selling. Most of the crops were sold to intermediaries on a cash basis; exceptions were the contracted crops--tomatoes, tobacco, and sugar cane.

Guatemala City was a major market for a majority of the farmers in the central region, but some of the products sold in the capital were re-sold by their buyers from El Salvador. Vegetables from western Guatemala were sold in the south coast cities, the capital city, Mexican cities, and in El Salvador. Milk produced in the parcelamiento Montufar was sold in El Salvador.

Most municipios collected a fee for each bulto (a net holding varying amounts) of farm products shipped out of the municipio. The growers were also charged a marketing fee in the capital city, and if they sold the crop themselves, had to pay bus fare too. Where the amount of produce sold was small it was often more economical to sell to an intermediary in the community, rather than pay bus fare to sell the small quantity in the capital city.

A significant proportion of the producers in Jocotillo, Zunil, and Almolonga owned trucks, thus reducing the usual cost of transportation--20 to 30 cents per bulto--to about 15 cents. In Pajco the lack of a convenient bridge and a road added to the marketing cost, since the growers paid about 15 cents per box for carrying the tomatoes or peppers across the river to the road. In El Milagro the sugar cane had to be transported across a rivel also. However, this barrier did not

affect the cost of transportation; rather the cane remaining uncut at the beginning of the rainy season was abandoned. The cost of a bridge is generally too great for the local people, and larger governmental units do not consider it worthwhile to construct a bridge for the benefit of only one aldea.

The costs of transportation, municipal taxes, and marketing charges seem to constitute a fairly large proportion of costs, and may tend to restrict production.

A majority of the farmers thought that markets for their product were secure. About equal numbers said that prices were set by the seller, by the buyer, or by both, with only seven mentioning market forces.

Living Conditions

In the less than $400 income group, the homes of the ladinos had more rooms than did the homes of the indigenas, averaging 2.1 rooms for the indigenas and 3.3 for the ladinos. For the higher income groups, however, the indigenas had a slightly higher average number of rooms per home. In general, homes of the farmers in the higher income groups were larger than homes of those in the lower income group.

More than 50 percent of the homes of the ladinos had steel roofs, whereas more than 50 percent of the homes of the indigenas had tile roofs; thatch roofs were also more common in the indigena areas. Walls were generally made of adobe. Dirt floors were more frequent among the ladinos than among the indigenas, though within

each ethnic group, those with higher income appeared less likely to have dirt floors, a tendency somewhat more marked among the indigenas.

The homes of the ladinos had an average of 1.8 windows per home compared to 1.6 windows for the indigenas. Within the middle and upper income groups however, the homes of the indigenas averaged slightly more windows per home.

The average value of the homes was lower for the indigenas than for the ladinos. Again however, among the middle and uppor income groups, the average value of the homes was higher for the indigenas than for the ladinos.

The general tendency for those with higher incomes to use electricity or modern gas lanterns was more apparent among the indigenas than among the ladinos. Cooking on the floor instead of on a raised fogon was common among the indigenas, but only one such case was found among the ladinos. Only a slightly higher proportion of the higher income farmers had toilets as compared to the lower income farmers, with differences between the ethnic groups apparently slight. Within both ethnic groups, those among the higher income groups tended to have greater access to potable water.

While all or nearly all of the interviewed farmers consumed tortillas, black beans, and coffee, ladinos on the whole had a more varied diet. Among both ethnic groups those with higher incomes tended to consume vegetables, eggs, and meat more regularly than the lower income farmers. However, little difference could be noted in the consumption of milk among the income groups of the indigenas.

Both ladinos and indigenas tended to spend more for each set of clothing as income increased, a tendency more pronounced among the ladinos in regard to work clothingand among the indigenas in regard to dress clothing. The value of household goods, including radios, also increased with income.

Food consumption, clothing purchases, housing, household goods, and other consumption items, as indicators of the effects of income upon the welfare of the farmers, all show that spending for these basics increases with increasing income. This increase seems somewhat more apparent among the indigenas than among the ladinos, partly because the indigenas in each income group tended to have lower incomes than the ladinos within the same group. At the upper limit of the $400 to $1,999 group, and for the upper income group, expenditures seem to increase more rapidly for imported items such as expensive radios, refrigerators, television, motorcycles, and automobiles.

A large majority of the farmers reported that someone in their family had been ill during the preceding year. A surprisingly large amount of money, averaging $100 for those reporting illness, was spent for medical care in the year.

Twenty-three percent of the children born into the families of all interviewed farmers had died, most of them below two years of age. The proportion among the indigenas was about 1 1/2 times that among the ladinos. This higher child mortality was especially evident in Almolonga, which may help account for the slow population increase in this community--much slower than for the country as a whole according to the 1950 and 1964 censuses, despite agreement

among everyone consulted about the community that no permanent out-migration has occurred.

For the group as a whole a higher proportion had died among the lower income groups, yet this distinction did not appear for either the indigenas or the ladinos when considered separately. The size of both groups which showed tendencies contrary to this generalization--the ladinos in the less than $400 group and the indigenas in the over $2,000 group--was very small, however. Among both ladinos and indigenas, the number of living children per family was highest for the middle income group.

Among both ladinos and indigenas a greater proportion of those in the higher income groups purchased newspapers and magazines.

Among all income groups the ladinos had a higher average net worth than the indigenas. The difference was both absolutely and proportionately less for the middle income group, very probably because there was less difference in average income between the two ethnic groups within this income group than within the other two income groups.

Personal Characteristics

Both the youngest and the oldest ladinos seemed to concentrate in the highest income group, whereas this tendency was not evident among the indigenas. Accordingly, of the ladino farmers those in the middle income group had the highest average age; among the indigena farmers those in the highest income group had the highest average age. Among the ladino farmers, the $400 to $1,999 group had the highest average number of children, and among the indigena farmers those in

the highest income group had the highest average number--expectedly so, since the farmers' average age is also highest for the same groups. The majority of the children, especially those under 17 and those in the indigena regions, lived with their parents or in the same community as their parents. Little difference was noted among the income levels in this respect. Most of the children not living in the home community worked in non-agricultural occupations.

There was only a slight difference in the proportions of ladino and indigena men who were literate, though the difference for the wives was greater. Some differences in literacy rates appeared among the farmers in the three income groups, but these differences were small for both the farmers and their wives. However, the children, especially the girls, were more literate than their parents. Ten percent of the farmers in the lowest income group, and 20 percent of those in the other two groups, had learned to read and write without formal education.

Even the slight relationship noted between literacy and earnings may be spurious. The children of the poorest parents are least likely to attend school, and are <u>also</u> least likely to receive substantial help when beginning farming. This situation affects certain families within the same community, and moreover, the communities with lowest literacy rates also exhibit the lowest availability of land. Children of poorer parents likewise may suffer other less tangible disadvantages--attitudes less conducive to farming on a larger scale and to use of credit, less knowledge of improved techniques, and less home familiarity with the Spanish language.

About 88 percent of the interviewed farmers were Catholic. Twelve of the 14 non-Catholics fell in the middle or highest income groups.

Background of the Farmers

Most of the fathers of the interviewed heads of families had been farmers, and most of these had been farm owners. In general, the amount of land operated by the fathers corresponded fairly closely to the amount presently operated by the sons, with the exception of the lowest income group--in this group the amount operated by the fathers was somewhat greater than that operated by the sons (but the average size of fathers' holdings in this group was affected by a few extreme cases). A majority of the fathers had obtained their first land by purchase, a lesser number by rental. More than half of the fathers had held some type of official position in the community--church, civic, military, etc.

On the average, about 70 percent of the brothers and sisters of the interviewed farmer lived in the same community as the interviewed farmer at the time of the interview. The proportion was 60 percent for the ladinos and 85 percent for the indigenas, not a great difference considering that 17 of the ladinos lived in resettlement projects. Of the brothers and sisters who lived in different communities, about one-half lived in Guatemala City. Most of the brothers were employed in farming and most of the sisters in housework; however, 51 brothers and sisters had a wide range of other occupations.

A majority of the total sample of farmers were born in the community in which they were interviewed. However, this held true for

only 40 percent of the ladinos compared to 85 percent of the indigenas. About 16 percent moved to the present community when less than 16 years old, and another 16 percent between 16 and 30 years of age. A higher proportion of those in the entire lower income group were born in the same community, largely reflecting the greater incidence of indigenas in this income group.

The indigenas acquired land at younger ages than the ladinos. Those in the lower income groups likewise tended to acquire land at an earlier age but acquired less land. The majority of the interviewed farmers, in both the ladino and indian areas, purchased their first parcel of land, though more frequently so among the ladinos. Whether the first plot of land was inherited, or purchased either from individuals or from the Agrarian Reform Agency, the amount acquired by the indigenas was less than that acquired by the ladinos. This difference applied especially to inherited land.

Generally, farmers in the higher income groups received their first land by inheritance and also received a greater amount of land--an average of 10.26 hectares--while the lowest income group's first parcel averaged only 0.84 hectares.

Farmers in the highest income group also obtained more of the land they owned at the time of the interview by inheritance, donation, squatting, or other non-purchase means than had the lower income groups. The value of the land obtained in these ways averaged $37 per family among the lowest income group, but averaged $677 per family for the highest income group.

About the same proportion in each income group had received family help in the form of use of a piece of land, though more in the lower income group had received help in the form of money. This help was generally received at the time of marriage and so the indigenas generally got such help at a younger age than the ladinos.

Only 13 of the farmers said they had received help from organizations in the community. Forty-five had received credit, however, with a higher proportion of this credit going to ladinos and to those in the higher income groups.

Nearly as many farmers had saved money from non-farm activities as from farm activities, despite the comparatively small proportion who had been or were engaged in non-farm activities. The indigena appeared more likely to save for land-buying purposes, an attitude which probably reflects the lower amount of available land in his home community.

More ladinos than indigenas had previously owned goods, either to bring to the present location or to sell when they moved, largely because more of the ladinos had moved, but perhaps also because of the greater wealth of the ladinos. However, little difference could be noted in this regard among the three income groups.

The background of the interviewed farmers seems important to their success in farming. With some exceptions the amount of land the sons operated corresponded to that which their fathers operated. Especially important are the large amounts of land received free of cost by the farmers in the upper income group--on the average 18 times that received free by those in the lowest income group. A higher percentage of those in the upper income group had also purchased land

relatively cheaply from the Agrarian Reform Agency. Even though a majority of the farmers purchased their first plot of land, it seems that farmers whose parents had been poor generally remained poor also. While the evidence does not directly support the supposition, it appears that the wealth of the father was an important factor in the amount of land the interviewees were able to purchase. While difficult to measure, advantages associated with higher socio-economic status, such as business attitudes and social aspirations, were perhaps as important as the amount of land inherited or help received from parents.

Social Relationships and Aspirations

A slightly higher proportion of the indigenas belonged to organizations in the community than did the ladinos. Religious organizations were preferred more by indigenas than by ladinos. A smaller proportion of those in the highest income group were members of organizations than of those in the lower income groups.

Membership in cooperatives was proportionately considerably higher among the indigenas than among the ladinos, and slightly higher among the lower income groups than among the higher income groups. Were cooperatives did not exist, the indigenas favored forming them somewhat more than did the ladinos. Sales cooperatives were the most desired type.

A higher proportion of the indigenas had held some type of office in the community than had the ladinos, usually, in each group, an office in the municipal government. In a majority of cases in which the father had held such a position, the son also held such a position.

Only 23 of the 117 farmers said they wanted one of their children to be farmers. The largest number of ladinos preferred that their children become professionals, while the greatest number of indigenas preferred that their children become teachers. In comparison to the two lower income groups, a somewhat lower proportion of the farmers in the highest income group wanted their children to become farmers, while a higher proportion wanted them to become professionals. In the lowest income groups nearly 40 percent wanted their children to become either teachers or "agricultural experts." Most farmers said their children would need help to reach these objectives, however.

The aspirations of the middle income groups appeared more realistic in regard to future occupations for their children than did those of the lower income farmers. A higher proportion in this middle group wanted their children to enter occupations which are better paid than farming, yet require less preparation than teachers, professionals, or agricultural experts.

A majority of the farmers said they were living better than they had 10 years previously. This proportion was somewhat higher for the higher income groups among both ladinos and indigenas. As indicated earlier, the farmers in the highest income group had come from families with more money than did those in the other groups. Apparently they were making considerably more progress as well.

About one-fourth of the ladinos and two-fifths of the indigenas said that they lived as well as or better than their neighbors. This response apparently reflected a tendency in some of the indigena regions for most of the inhabitants to be equally poor.

Over one-half of those who responded thought that neighbors had attained higher living levels because of inheritance, luck, or better opportunities. This judgement accords with the earlier conclusion that these factors were important to the relative degree of success of the interviewed farmers as measured by their income.

An overwhelming majority of the farmers said they would spend additional income for farm production purposes, while 14 percent said they would spend more for education of their children. About one-third of the indigenas, however, would spend some of the increase for consumption, reflecting the present lower consumption levels among them. A somewhat higher proportion of the middle income group said they would spend money for education than did those in the other income groups. For the most part, therefore, increases in income for these farmers would tend to generate further increases in output. This conclusion agrees with the farmers' most commonly expressed opinions about obstacles to higher income--lack of money, lack of credit, and lack of land.

Technical Change

The growing of principal crops other than corn was not a recent change, since about one-half had grown the principal crop (other than corn) for 10 years or more, and 45 percent had grown the second most important crop (other than corn) for 10 years or more. Of those using organic fertilizers, almost one-half had begun using them 10 years or more previously. Chemical fertilizers, fungicides, and insecticides, however, had been used for 10 years or less by

about 90 percent of the users, and improved seeds for 10 years or less by more than two-thirds of the users. Of the few who reported when they had begun using irrigation the majority had begun more than 10 years previously.[9]

The soil was worked by hand in most highland regions, with oxen used in three highland communities--Chiantla, Aguacatan, and Pajco.[10] Tractors were used quite extensively in the lowland regions of Montufar, Cuyuta-Milagro, and Ovejero-Monjas. All these latter regions are fairly level, making the use of tractors profitable. In addition, the use of tractors in Monjas is almost mandatory since the soil must be plowed deep to produce well.

About one-fourth of the farmers used some type of terraces or contours to prevent erosion. Crop rotation is not generally practiced, except for rotation of crops within the year when one crop is grown during the rainy season and another during the dry season. Little attention is given, however, to the rotation of crops to improve the soil or to control plant disease.

The supervised credit agency (SCICAS) was preferred as a source of credit by many farmers because of the low interest rate. The national agrarian bank (BNA) was preferred by some because less red tape was involved in obtaining a loan from this source.

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[9]This information was not obtained for the majority of the users of irrigation water.

[10]No particular reason was apparent for the use of oxen in one highland community and not in another.

A variety of methods were used to transport the crops from the field to the place of assembly or storage. Most common in the indigena regions was human transport, either by use of a head strap among the men, or on the head among the women. The use of ox carts or trucks was generally more common in the ladino regions, although many ladinos also packed the loads on horses or mules. Storage for non-perishable crops was more generally traditional in the indigena regions, but in some of the ladino regions storage in small steel "silos" was fairly common.

The feeding of poultry and hogs was generally haphazard, both animals fending for themselves for a large part of their food, especially during the rainy season. Most regions raised only unimproved native breeds. Disease control was poor, with death losses and losses from chronic disease and parasites contributing heavily to the general inefficiency of poultry and hog operations.

The farmers generally depended upon pasture for cattle feed during the rainy season. In the dry season cattle were fed on crop wastes, or in some cases molasses or cotton hulls. In most cases the cattle were run with a bull in pasture so that the farmer practiced no close control of breeding. In general, no veterinarians served the farms, and medicine and injections were bought by peritos agronomos[11] or the farmers themselves and given rather indiscriminately.

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[11] "Agricultural experts" trained only in crop production at approximately the high school level.

Fifteen to 20 percent of the farmers had received some agricultural training, with little difference in the proportions between either ethnic or income groups. About 54 percent had received information concerning farming practices, either from experts who had visited their farm, from attending meetings, from receiving literature in the mail, or from writing letters requesting literature to companies or government agencies. The majority who bought fertilizers and seeds bought them outside of their home community, indicating that they sought these inputs rather than being influenced to use them by sellers who came to the farm.

Somewhat more of the farmers said they relied upon neighbors for farming information than said they relied upon peritos agronomos. A considerable number also said they had been influenced by sellers. The majority of the farmers said they desired technical help; this proportion was slightly lower for the ladinos and slightly lower for those in the upper income group. Most of those who desired technical help preferred peritos agronomos.

Except where irrigation was used, most of the farmers planted their crops to coincide with the start of the rainy season. However, among those who planted during the first month of the rainy season, 38 also reported that they considered the phase of the moon. Most preferred the increasing phase or full moon for planting, but some avoided the same periods. Farmers consulted neighbors, elders, peritos agronomos, and the purchasers of the crop (in the case of contracted crops) about the time of planting.

A majority of the farmers did not burn refuse from the previous crop and weed growth before planting. Among those who did burn, the chief reason was to make the soil easier to work by hand.

Of 92 farmers who said that fertilizer increased production, nine said they did so because the fertilizer contained elements missing in the soil. A majority simply said that yields increased or that it "gave force" to the soil. Four thought that the fertilizer killed insects and microbes. Some said fertilizer application resulted in lower yields, possibly because they made too heavy or improper applications.

Implications and Recommendations

This section incorporates information obtained from the formal interviews, and information independent of the interviews.

The Study Situation and Theories of Economic Development

Based on the findings of this study, the farmers interviewed, Indian and ladino, literate and illiterate, exhibit positive attitudes toward change and seem aware of the possibilities for technical changes. Johnston and Mellor consider these to be essential preconditions to agricultural development.[12] A fairly large proportion of the farmers studied here have changed to more profitable crops

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[12]Bruce F. Johnston and John W. Mellor, "The Role of Agriculture in Economic Development," American Economic Review (September 1961), pp. 566-593.

and have begun using modern inputs, though others hold but limited ability to make changes because of their poverty.[13]

Most of these farmers do want to channel at least part of their future income increases into productive investments on their farms--an important viewpoint for the development of agriculture--and into education for their children. As regards consumer goods, most appear to want better homes and better diets; those with higher incomes also want radios, bicycles, motorcycles, trucks, and autos. Therefore these farmers do not seem to lack personal incentives for improving their incomes.

The agriculture of Guatemala is apparently in "phase II" of its development--defined by Johnston and Mellor as the stage at which "(1) agriculture represents a large proportion of the economy, (2) the demand for agricultural products is increasing substantiallly, but the 'required' increase in output of food for domestic production is fixed within narrow limits determined by the rate of increase of population and of per capita incomes, (3) capital for the expending industrial sector is particularly scarce, (4) the distinction between resources of high opportunity cost and those which are abundant in

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[13]Some of the interviewed farmers belong to the subsistence sector described by Manuel Gollas Quintero, who concluded that small farmers were inefficient because they were poor, rather than poor because they were inefficient. See Gollas' "History and Economic Theory in the Analysis of the Development of Guatemalan Indian Agriculture," Ph.D. Thesis, University of Wisconsin, Department of Agricultural Economics, 1969.

agriculture and are characterized by low opportunity cost is of considerable importance."[14]

In Guatemala, about 65 percent of the economically active population was engaged in agriculture in 1964. This percentage has probably declined slightly since then, but the absolute number has increased.

The domestic demand for agricultural products no doubt increases along with population increases. In Guatemala, potential demand for food is very great, especially if diets were upgraded from corn and beans to higher protein foods of animal origin. This potential will not be realized, however, unless the incomes of the majority of the people are raised. Increases in per capita income occurring at present are mainly due to large increases in income among the middle and especially the upper income brackets, which exert a disproportionate influence upon the average. For these individuals the income elasticity of food is fairly low, and income increases are likely to be spent for imported goods. The narrow demand limits for food mentioned by Johnston and Mellor are evident in the periodic production gluts of vegetables and even the basic staples at some seasons and in some years, followed by seasons or years of shortages.

It is seldom realized that surpluses of food can occur in countries where the diet of a majority of the people is extremely

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[14] Johnston and Mellor, op. cit.

poor; Bosterup and Wharton[15] have mentioned this phenomenon for other countries also. As Dorner suggests, "Where agricultural population makes up a large percentage of the total, a major part of the increase in demand for food (required to avoid price declines following increases in farm output) may have to come from the farm population."[16] Since more than 50 percent of the rural Guatemalan population consists of agricultural laborers,[17] and another large proportion consists of subsistence farmers whose production is still unaffected by modern farming methods, exportation of the increased farm production occurring among the farm group represented by the interviewed farmers has been proposed as one way to increase demand and maintain prices. However, no real assessment of the potentialities of such an export market can be presented here.

Capital for expanding the non-agricultural sector may not be particularly scarce in Guatemala--large profits are being earned in plantation-type enterprises which pay low wages.[18] The problem seems to be the channelling of these profits toward investments that result in economic development, rather than a lack of capital.

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[15]See Ester Bosterup, "Surpluses in the Third World--Who Wants Them?" Ceres, Vol. 1, No. 5 (September, October 1968); and also Clifton R. Wharton, Jr., "The Green Revolution: Cornucopia or Pandora's Box?" Foreign Affairs, Vol. 47 (April 1969), pp. 464-476.

[16]Peter Dorner, The Influence of Land Tenure Institutions on the Economic Development of Agriculture in Less Developed Countries, Land Tenure Center Paper No. 55 (Madison, University of Wisconsin, October 1968).

[17]Direccion General de Estadistica, Censos 1964 Poblacion (Guatemala: Junio de 1966).

[18]Schmid, op. cit.

Labor is the most abundant resource of Guatemalan agriculture, with land and capital relatively scarce. This characteristic would appear to require labor intensive (capital and land-saving) techniques, as recommended by Johnston and Mellor, rather than labor-saving practices. The distinction between yield-increasing and labor-saving techniques is not always clear, however, since there are instances (such as in Monjas) where subsoil tillage is essential to permit water penetration--the use of tractors is mandatory if this land is to be cultivated. In other communities also, some of the farmers stated that plowing with a tractor rather than oxen would increase production. Plowing also eliminates the major reason for burning the plant residue, that of making soil preparation by hand methods easier. Therefore, tractor use can be yield-increasing and may allow the cultivation of land not cultivable by hand methods, as well as being labor-saving, in those areas where the topography and freedom from excess rockiness permits.

A divergence often exists, however, between private interests and social interests in regard to mechanization on farms. It is well known, even in many of the highland communities, that it costs only about 2/3 as much to work the land with tractors as it does by hand, where land is level enough to use tractors (in trenching for planting sugar cane, the savings are even greater). However, use of tractors would result in less employment for farm laborers for whom alternative employment is not available.

Since tractors must be imported, purchasing large numbers of them might require foreign exchange that would better be used to purchase machinery to do work that cannot or would not be done by hand.

Development needs include improved farm management, so that food and other agricultural goods can be produced more cheaply, in terms of the use of the scarce resources, land and capital. Modern yield-increasing inputs such as fertilizer, improved seeds, more adequate irrigation, insecticides, and fungicides will make better use of these scarce resources. Johnston points out that labor productivity on Japanese farms doubled from 1885 to 1915, largely through the use of fertilizer and improved rice strains.[19] Such inputs increase labor productivity while holding employment in agriculture at or above previous levels, rather than reducing employment as do purely labor-saving techniques.

As Raup suggests, "...output-increasing forms of agricultural technology depend on the improvement of the technical skills and management of...the farm labor force. Land tenure reform that will best serve these needs is one that will give the maximum incentive for increased output to the largest percentage of the agricultural labor force. Large-scale heavily mechanized units do not seem suited to this task. Small-scale units, intensively worked by a literate and skilled labor force having a direct interest in high output and good husbandry are the ones indicated."[20] The evidence of the present study generally supports these statements, except that literacy did not appear so important as Raup suggests.

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[19]Bruce Johnston, "Agricultural Productivity and Economic Development in Japan," Journal of Political Economy, Vol. 59 (December 1951).

[20]Phillip Raup, "The Contribution of Land Reforms to Agricultural Development: An Analytical Framework," Economic Development and Cultural Change, Vol. 12, No. 1 (1963), pp. 1-21.

In general, the following analysis takes the viewpoint that large increases in agricultural production are needed to increase farmers' incomes, yet much of the demand must come from the farm sector itself. Also, Guatemala is at the stage of development where yield-increasing technology is generally more applicable than labor-saving technology. Clearly the use of tractors without expanding greatly the total amount of land cultivated would only decrease the amounts of farm labor needed and thus decrease employment. However, if enough expansion in the amount of land cultivated could be attained to accommodate the large number of landless workers and those with very small parcels of land, the use of machinery is justified.

This study began with the idea that an increase in the number and proportion of commercial family farms is desirable. The family farm is conceived to be that amount of land which would generate sufficient net income for the farm family to live healthfully, and to make some progress in educating their children and improving the farm, without the necessity of hiring labor, yet furnishing reasonably year-round employment to the family members. Only a few of the sample farms matched this concept in both net family income from the farm and the amount of labor hired; most of these consisted of about 20 hectares (50 acres) of land and much of the work was done with machinery. Therefore the farm family was not fully employed and the amount of employment per hectare furnished by these farms was much lower than on the smaller farms.

According to the most optimistic estimate of the amount of land appropriate for agriculture in Guatemala, less than 7 million hectares

can be exploited. About 3 million hectares are cultivated at present, leaving about 4 million hectares of usable land uncultivated. Of this 4 million hectares, at least one half is usable only for pasture. Since a dairy and beef combination farm requires at least 60 hectares to produce a reasonable income if none of the land is cultivable, this 2 million hectares would absorb about 30-35,000 farmers and reduce the demand for tillable land by 660,000 hectares. However, over 8 million hectares are still needed to furnish 20 hectares of land to the remaining 85,000 landless and the 375,000 farmers with less than 7 hectares of land (after allowing for the 840,000 hectares already operated by these farmers). The land needed, according to the above estimation, is about 2 times the amount of cultivable land if all the cultivable state land and all unutilized cultivable land in private farms were to become available. These figures are gross estimates made from Guatemalan census bureau and planning office publications, but do give some indication of the magnitude of the problem. Enough land cannot be made available for every farm family to have sufficient land for a "family farm" according to the concept employed here.

Apparently "family farms" are more likely to develop where wages are above the subsistence level. With the existing wage level, a farm large enough to provide a satisfactory income for the operator can hire so much labor that the little additional income gained by the operator from using family labor too is not worthwhile; it is easier for him to work slightly more land or to get by with slightly less income. (See Table 1). Higher wages for hired labor would make it more worthwhile for the farm family to furnish a higher proportion of the labor used.

It seems that only by creating small farms from national and expropriated private land can the majority of rural people be given some sort of viable opportunities on the land. The secondary effects upon the Guatemalan economy of raising the majority of the rural population from family incomes of under $200 to $400 or $600 would be much greater than raising the incomes of a much smaller proportion of the rural population to levels of $2,000, $4,000, or even more. The increased demand for food, housing, and clothing, much of which can be furnished from domestic sources, would be much greater if the incomes of the majority of the population are improved. As observed on the farms studied here, when incomes increased above $2,000 a large proportion of income increases was spent for imported durable goods, motorcycles, autos, television, etc.

Since the urban population can absorb only quite small increases in food production, and since the majority of people are engaged in agriculture, much of the increased production must be consumed by the farmers. The interviews and observations of the living habits of the farmers also showed that a greater proportion of increases in income of the poor farmers would go toward productive investment and education of the children than was the case with increases in higher incomes.

As an alternative to the original "family farm" plan, the number of middle sized farms could be increased (these would no longer fit the family farm concept) by encouraging the employment of much hand labor and discouraging the use of machinery. This plan provides more employment and thus distributes income slightly

better than the first plan. It also reduces balance of payments losses from the importation of equipment. However, these middle sized farms would differ little from the large farms as far as the laborers are concerned, since hired labor needs would be about equal and wages would be even lower than on large farms; moreover, many present middle-sized farmers stand violently opposed to increased welfare of the small farmers and the landless laborers at their expense, as do large farmers. Given the labor situation and such attitudes, little advantage would be realized by creating farms of this size except possibly from the standpoint of production; they would be unsuccessful at reducing the social and economic gap that exists between the lowest class and the rest of society in Guatemala. This judgement agrees with a United Nations report which said, "In most reforms the middle class tends to be conservative from the standpoint of the peasant. They desire to replace the landowning class but not to elevate the peasantry to their own ranks." This report also noted that "The picture of growing middle classes as sources of dynamism and political stability is replaced by a picture of the existing middle classes of the region as beneficiaries and defenders of existing structural barriers to the effective incorporation of the marginal strata into national societies."[21]

Since superimposing a system of middle sized farms upon the structure of small farms and landless laborers appears neither

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[21] United Nations Report on the World Social Situation (1967).

feasible nor equitable, and since there is insufficient land to provide "family farm"plots for all of the small farmers and landless, the only alternative appears to be an attempt to increase production upon the small farms already existing, along with the creation of more relatively small farms which would allow a larger proportion of the small farmers a chance to increase their incomes somewhat.

This plan accords with Parsons' idea that an individual's wants generally depend upon his present situation. The improvement sought is proportional to what he now has--he may seek a 25 percent or a 50 percent improvement, but rarely the 100 percent or 200 percent improvement one might expect if he wanted a given absolute level of living (say equivalent to that of the urban middle or upper class).[22] Where the demonstration effect is extremely strong, for example among the blacks in the U.S., this idea does not hold true but it would still appear true for Guatemala, at least among the majority of the rural people. Raup takes a similar position.[23]

As previously noted, increasing the incomes of the majority of the lower income rural people effects an increasing demand for domestic goods (more than a demand for imported goods), though the desire for imported goods begins at a surprisingly low income level (even some farmers who apparently earned less than $1,000 per year had purchased expensive floor model radios, refrigerators, etc.;

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[22]Conversation with Kenneth H. Parsons.

[23]Raup, op. cit.

in the city, maids who lived in one room shacks possessed expensive radios, electric blankets, and coffee makers.

The principal benefit of the distribution of land in small parcels, however, is the increase in the number of people participating in agricultural income distribution. As suggested by Kanel, small plots of land result in employment for a greater number of persons than would be employed in a purely least-cost combination of labor and equipment.[24] The greater intensification of farming operations on small parcels results in lower production per unit of labor but greater production per unit of land. Since few alternative opportunities exist for labor, and since land is scarce, total agricultural production thus would be higher with small agricultural units than with large units.

Farm sizes required to produce the equivalent of $1,000 net income from crop production are shown in Table 1, both with and without family labor use, according to data obtained from the interviewed farmers. Soil quality of course varies considerably; therefore these figures must be considered approximate. For growers of crops other than corn, it seems desirable to furnish an additional one-third to one-half hectare to each farmer for growing his own corn supply--the farmer generally feels safer if he is able to raise his own corn rather than buying it. Where land is rough it is desirable to supply land for pasture, the amount depending upon the amount of rough land in the community, as the later could be divided equally among those who wanted it.

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[24] Don Kanel, "Size of Farm and Economic Development," Indian Journal of Agricultural Economics, Vol. 22, No. 2 (April-June 1967). Also as Land Tenure Center Reprint No. 31 (Madison: University of Wisconsin, 1968).

Table 1. Amount of Land Required to Earn the Equivalent of $1,000 from Each Crop, with Given Yields Using Hand Tools and Oxen Only

		Highlands							
		Hired Labor Only				Family Labor Only			
	Yield	Value Product ha.	Costs	Net	Minimum Has. Req.	Value Product ha.	Costs	Net	Minimum Has. Req.
Corn	30 qq	$ 120	$ 70	$ 50	20	$ 120	$ 20	$ 100	10
Beans	15 qq	120	50	70	14.3	120	10	110	9.1
Gusquil	600 bultos	1,200	580	620	1.6	1,200	380	820	1.2
Potatoes	250 qq	880	560	320	3.1	880	335	545	1.8
Garlic	100 qq	1,700	600	1,100	0.9	1,200	320	1,380	0.7
Cofee	50 qq	200	75	125	8.0	200	5	195	5.1
Pineapple	195 bultos	680	25	555	1.8	680	70	610	1.6
Flowers	--	4,000	1,200	2,800	0.36	4,000	275	3.725	0.27
Vegetables (Intensive)	--	5,370	1,285	4,085	0.24	5,370	710	4,660	0.21
		Lowlands							
Corn	40 qq	$ 160	$ 55	$ 105	9.5	$ 160	$ 28	$ 132	7.6
Sorghum	27 qq	67	47	20	50.0	67	100	66	15.2
Tomatoes	850 boxes[a]	1,030	540	490	2.0	1,000	110	890	1.1

[a]One box contains 50 pounds of tomatoes.

Recommendations

A two-part program to increase production seems desirable: 1) raise production per unit of land on existing cultivated farms; and 2) create new farms from national land and unused land now in farms, participants in the second part of the program to be selected carefully from among the young farmers (or children of farmers) who have demonstrated ability to produce well on a small scale.

Increased Production on Existing Farms

Greater use of yield-increasing techniques upon the existing farms would have two benefits: 1) it would make better use of the scarcest resource land; and 2) it would accustom the farmers to modern farming methods which produce much more than traditional farming methods--hopefully the farmer who later transfers to a new region could then create a dynamic agriculture based on this experience, rather than another subsistence agriculture farm.

The studied farms exhibited considerable difference in value product per hectare according to the proportions of the various crops planted, the use of fertilizers, insecticides, and fungicides, and other uncertain factors of which natural soil fertility and climate were probably the most important. The differences related to the controllable factors were important enough, however, so that an important part of any policy for developing the agricultural sector of Guatemala must be the encouragement of more widespread change from corn production to the production of crops with a higher per hectare value product. The use of other yield-increasing inputs such as fertilizer, insecticides, and irrigation should also be

promoted wherever feasible. These changes are adopted fairly rapidly wherever the returns are sufficiently large.

The package concept of fostering changes in agricultural practices has gained much favor in recent years. This concept recommends that all limiting factors be supplied at the same time. Proponents point out that this method avoids the waste of inputs that occurs when only one input is added but more are really needed to overcome the limits of production. One cannot deny the efficiency of this approach, if farmers were able to make all of these changes at once. However, even among literate U.S. farmers, changes never came about in this manner except when the process of change was fairly well advanced and farmers were accustomed to change. Illiterate farmers are even more likely to be confused by this approach. Financing all of these changes at the same time involves another difficulty.

At the early stages of change especially, it might be more appropriate to encourage farmers to improve one limiting factor at a time rather than all limiting factors at the same time. For example, if fertility is the most limiting factor, as seems true in many instances, the farmers are encouraged to improve this situation roughly up to the point at which other factors become limiting. At that point efforts are directed toward overcoming the next most limiting factor--efforts such as weed control or insect control.

Change acceptance and application are much simpler for the farmer in this fashion than if all of the factors are changed at one time. The finances needed for first input are relatively low, and the financing of further inputs can proceed with the gains from the

first input. On the other hand, the situation becomes more difficult for the change agents; they must have a more intimate knowledge of the problems and know which changes to advocate at which point. Where new crops are introduced acceptance of the package can be much more readily achieved. In most instances increases in corn yields are first necessary, however, to free land from family subsistence needs for planting to these crops.

Of course, some circumstances demand the package approach as the only way to increase production. In the highlands of Guatemala, however, FAO fertilizer trials and personal observations both indicate that much higher yields of corn and wheat can be achieved solely through through the use of fertilizer.[25] This "fertilizer approach" is less applicable in the lowland regions and for crops such as tomatoes, yet even in these crops and these areas there appears to be some room for moderate increases with the use of fertilizer alone.

Attention to animal production, especially to preventing animal losses, would not only improve the diets of the farmers but also raise their cash incomes. This step requires a change in attitude

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[25] D. Koole and C. H. H. ter Kuile, Resumen de Resultados del Programa de Fertilizantes de Guatemala en 1963, 1964 y 1965 (Guatemala: 1967). The same results were reported by Oscar I. Ortiz M., soil specialist with the Ministry of Agriculture (see Prensa Libre, Agosto 14, 1968), and by Dr. James Walker, soils expert from North Carolina who told the author in 1967 that corn yields of more than 100 bushels per acre were being attained on an experimental basis using the same corn varieties as the natives do.

toward animal production among both farmers and change agents; their attention in the small farm sector so far has focussed largely on crop production. Training of the perito agronomos who engage in extension work should include veterinary science. Present medical treatment of animals is similar to that of humans and makes indiscriminate use of antibiotics--no apparent safeguards are taken to prevent contamination of meat and milk by these treatments. Training for the sellers of medicines (as well as for sellers of insecticides, fungicides, etc.) could help reduce these dangers. In the United States dealers have been known to push the indiscriminate use of chemicals; only the farmers' own knowledge and judgement has prevented more contamination than has occurred. Where many farmers are illiterate this safeguard does not exist.

It would be difficult for a small farmer producing poultry, meat, or eggs to compete in the city markets, since large scale poultry farms can produce more cheaply. However, since the labor of the farmer's wife does not have much value from the viewpoint of opportunity cost, poultry and hog enterprises could at least help furnish a better diet for the farm family. Such production could also meet the demand for criollo eggs and meat, which command a higher price than the granja-produced eggs and meat. The same argument can be made for the production of milk and beef (using otherwise wasted forage and unutilized family labor). Such enterprises exist on many small farms, but they should get more attention than is generally given them now by farmers and extension services.

Even though the extension service may not play the most important role in the change from traditional to modern agriculture, it could accelerate the change by increasing its efficiency. There appeared to be little difference in the rate of adoption of new practices between regions where there were extension agents and regions where there were not, except in the communities with cooperatives and/or the influence of the Belgian priests. One reason for this inefficiency appeared to be lack of communication between extension field agents and their supervisors in Guatemala City.[26] Extension lacks clear cut plans of its activities. Reports from field agents are submitted, but they are filed and seen by few people; moreover, their writing seems more a formality than a planning guideline.

Perhaps a major reason for the ineffectiveness of Guatemalan extension services is that they were modeled after the U.S. system rather than developed according to the needs and circumstances of the culture. As Dorner stated, "If we have anything to offer farmers and government now undertaking the difficult task of agricultural development, it is perhaps the fact that much of the development efforts in this country were led by farmers pressuring governments at various levels for

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[26]Cases were encountered in which the farmers complained that the extension agent did nothing to help them, the agent complained that he could get no information from the central office in the capital, and the central office complained that no one told them about the problems. In another example the central office maintained that the results of soil tests could be obtained in a few days, while field advisors said they had been waiting months for this information.

making changes that would benefit them."[27] The government of Guatemala does respond to the demands of the Association of Agriculturists, but this organization includes only large farmers and not small farmers. The government does not encourage organization of small farmers, so it seems logical that the extension service is poorly oriented toward the small farmers, especially since the extension agents come from the middle classes.

The extension service could gain the confidence of farmers if it could help them with a problem such as a plant disease, thereby making easier the acceptance of future changes suggested to the farmers.

In view of the extremely large number of small farms, it is important to concentrate somewhat on providing incentives for increased production, rather than depending only upon extension services to promote the use of non-traditional inputs. This effort can proceed from two directions--providing inputs more economically, and helping the producer capture a greater proportion of the consumer dollar.

Farmers in regions where input use was relatively large complained about the common market policy which protects the fertilizer plant in El Salvador through tariffs on fertilizer produced outside of the common market countries. They charge that this policy decreases incentives for the use of fertilizer, increases prices to the consumer; reduces the profits of the farmers, and allows the

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[27]Peter Dorner, "Popular Participation in Agricultural Development Programs," Paper presented to the New York Society for International Development, November 21, 1968.

benefits to accrue to the foreign (U.S.) investors.[28] Some farmers also claimed that the fertilizer sold in some regions was "false fertilizer"--that its use did not increase yields. Perhaps faulty application, use of the wrong formula, weather conditions, or other factors gave that result; but it is also possible that some dealers had diluted the fertilizer.

In any event, the provision of quality fertilizer at reasonable prices (even through subsidization) in order to reduce the price to the farmer would seem more effective and more economical than hiring and training enough extension workers to contact all the farmers with extremely small plots of land. Farmers behave "rationally" in the use of fertilizer, adopting it most rapidly for those crops on which it gives the highest returns. Other needed inputs, such as insecticides and fungicides, should also be supplied at the lowest cost possible to the small farmers. Apparently some type of integrated operation or cooperative serves best at getting the inputs directly to the farmers. The cooperative in Teculutan operated more or less as an agent between the farmer and the Grace and Co. firms Kerns and Ducal; not only supplying the inputs but also giving technical help.

The tobacco companies supplied similar services in Monjas and Overjero, and also sold the burners used for curing tobacco. This arrangement kept the farmer committed to tobacco growing, since the

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[28] Mosher, in Getting Agriculture Moving (New York: Praeger, 1966), has mentioned the disincentive effects upon farm production of imposing heavy import duties on farm supplies to stimulate domestic manufacture.

burners and other required buildings amounted to a sizeable investment for the farmer. The growers received this attention in these two regions because the companies wanted to control the quality of the product. In Monjas considerable hard feelings against the tobacco companies existed because of disagreement over tobacco grading. The growers accused the companies of purposefully grading their tobacco low so that they could pay lower prices than called for in the contract. The companies in turn accused the growers of plating more tobacco than called for by the contract. A cooperative was being formed by the growers to deal with the problems. There are difficulties with vertical integration, yet this system has helped increase tobacco production; an increased number of these relationships in other crop-industries might also effect increased production.

Cooperatives can help get inputs to farmers and sell the product. However, they cannot be depended upon to reach the farmers in the lower economic class; co-ops are often founded by the larger landowners or cash renters, while sharecroppers and other small farmers are not allowed to join.

Much of the success of cooperatives in helping those who need help depends upon the social and political structure within the community. In most of the Indian communities cooperatives have a better chance of reaching the small farmers than they do in ladino communities, since poverty is quite universal in the former. Exceptions are San Bartolome Milpas Altas and San Lucas Sacatepequez, where land distribution is more unequal than in other indigena

communities. In a majority of the communities, cooperative action is rendered difficult by the great differences in the individual farmer's viewpoints toward change programs. Besides the rift in political viewpoint between the poorest, who are generally somewhat leftist, and the slightly wealthier farmers, who characterize the small farmers as communist, there are also differences between producers, intermediaries in the sale of farm produce, and inputs supoliers. Myrdal mentions this clash of interests for Asian communities, stating that it presents an obstacle to cooperative action and even to land reform.[29]

While the organization of farmers' cooperatives is highly desirable as a means of introducing new methods, proportioning credit, etc., the purposes of the cooperative affect its success importantly. Some may be formed as anti-communist devices; some may be organized to actually help the small farmers, the large farmer, or some other group. Sponsoring groups should look very closely into the real motives of the organizers and examine all the secondary effects the cooperatives may have.

The willingness of local people to belong to local committees for community improvement may point to a desire for community improvement. In some regions these committee members and other farmers donated money toward the improvements of roads, building of schools, etc., a situation which also indicates that the people are far from

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[29]Gunnar Myrdal, Asian Drama, an Inquiry into the Poverty of Nations, Vol. I (New York: Twentieth Century Fund, 1963), pp. 1303-1304.

apathetic about their communities.[30] In many local communities, local resources apparently could and would be used to improve the lot of the majority of the people, if the community were authorized to do so by the central government. In other communities the control over local conditions exerted by certain individuals or families is obvious, and little can be expected in the way of general improvement. Both ladino and indigena communities fell into these categories.

Because of such ethnic and local "political" differences, it is difficult to make definite recommendations. However, the right of the local community to develop new tax sources (such as a land tax) might lessen tax evasion since the people could see what the money was used for in the community; at present taxes go to the capital city with only part, if any, returned to the local community.

Local property taxes could also discourage wealthy city people from buying land within the Indian communities near the capital city (where land is already scarce). At least local communities could gain some revenue from these weekend residents by local taxation (especially since homes and other buildings constructed are generally worth much more than the value of the land).

Advisors to the farmers should consider the comparative advantages of various crops in each region. According to the data

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[30] One case in which a committee for improvement of the community evolved into a cooperative occurred in Pajco; however, leadership of the Belgian priests was probably a major factor in channeling community efforts into the cooperative and into the major irrigation effort undertaken there.

obtained in this study, the yields of black beans in Pajco were nearly as high as those of corn. Since the sale price of beans is at least double the corn price, it seems to be a better crop than corn for the region. The experience of the Quaker agronomists in the neighboring municipio of Jocotan with a soybean variety from South America substantiate this conclusion--yields had not been calculated but apparently reached about 20 bushels per acre.[31]

Production could apparently be increased in some regions, without changing to tractor power, by developing ox-drawn machinery that would do a better job than hand cultivation or the plow now used.

Though this study emphasizes production, the need for instruction in nutrition and the preparation of food also deserves mention. Even in communities producing vegetables, vegetable consumption is low. According to the teachers at the school in Almolonga, the principal vegetable producing area in Guatemala, many local residents say they do not know how to prepare vegetables. While this may appear somewhat strange, it is true that many of the vegetables grown there have been introduced from the United States comparatively recently. Very

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[31]The soybeans were mixed with corn to make a tortilla with a higher protein content, these were said to be acceptable to the residents. A major problem was rabbits; the farmers were afraid to possess firearms (they might be accused if violence occurs) and apparently did not know how to trap rabbits.

probably much can be done to increase the proportion of vitamins and minerals in the foods after preparation.

The consumption of some foods could increase if prices for processed foods were lower; with some exceptions these prices are several times those of the U.S. and often the product is of lower quality. All processing plants are located in the capital. The possibility of locating a processing plant near the vegetable growing areas, as proposed by the local priest in Almolonga, needs study.

Though evidence is scant to support this point, comments of farmers and others within the communities give the impression that higher production through use of improved techniques has led to lower prices and lower profits from the operations of those farmers who have not used improved techniques. Apparently, farmers using better management practices are thus able to purchase the land of the others, leading to an even more unequal distribution of land than previously.

Investments by the state in infrastructure, which will do for the small farmers what the large farmers can do for themselves, can help the small farmers compete with the larger farmers. Possibilities here include roads, better schooling, more credit for small farmers, and bridges. Electricity or gas lamps, to light schools for night classes, was thought essential by local teachers.

While a small producer meets difficulties in obtaining credit for production purposes (even if he is not frightened by

the need to mortgage his land), it is even more difficult for him to obtain credit at reasonable rates for the purchase of land. In fact, no credit agency (except for family lenders) will presently lend money to small farmers or landless workers at low rates with long term payment provisions. Large farmers get loans for land purchase from banks comparatively easily, and are also more likely to get loans from family members. If credit on realistic terms for land purchase was available to small farmers, they might compete more evenly with large farmers for the available land.

Transportation and other marketing costs should be reduced. Transportation costs of purchased inputs and farm products can be lowered by road and bridge construction where these are needed (Pajco and El Milagro, for example). Cuts in the taxes paid on gasoline and on the importation of trucks are also a possibility.[32] Marketing losses of food products, especially fruits, are high because of poor and rough handling. Pineapple losses, for example, allegedly range as high as 50 percent.

All products must apparently go the capital city and all inputs come from the capital, because of transportation difficulties and partly because of tradition. For example, balck beans raised in the northern part of the department of Jutiapa and citrus fruit grown in the south coast region are both sold in Guatemala City.

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[32]Rafael Piedra Santa, "Verdaderos Origenes del Alto Costo de la Vida en Guatemala," Speech to the Seminar on the High Cost of Living, Guatemala, March 1967.

Retailers in the parcelamiento Montufar, in the sourtheastern corner of Jutiapa, purchase these products in Guatemala City. Thus the products travel two to three times as far as the actual distance between the place of production and the place of consumption. In the case of black beans no roads connect the two areas, but in the case of the citrus fruit there is a road. Likewise, milk producers in Asuncion Mito in northern Jutiapa buy cattle feed, including much sorghum precessed in the capital, even though Jutiapa is the principal sorghum producing department. The absence of roads built to serve internal commerce (rather than export commerce and tourtists) accounts only in part for this seemingly irrational distribution system. The farmers of San Sur, the easternmost aldea of Palencia, knew of the possibilities of a more direct transportation route to markets by means of a road east to Jutiapa, and several interviewed farmers voiced a desire for this road. Transportation is not enough, however, as evidenced by the citrus example. In the case of cattle feed, some of the ingredients could be brought in and mixed with the local grains.[33]

These considerations require more careful investigation to determine how much can be saved in the marketing process. Rostow has estimated that in most underdeveloped countries more efficient marketing can reduce food prices 10 percent.[34] The majority of

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[33]This point has not been checked, but according to news stories government control has allocated protein and mineral supplies to certain monopolies, making the problem more complex than it appears at first glance.

[34]Walter W. Rostow, "How to Make a National Market," address made before the Farm Equipment Institute at New Orleans, La. on October 1, 1963. Printed in Department of State Bulletin, October 28, 1963.

the people of Guatemala spend 70 percent or more of their income for food. The savings would probably accrue to consumers rather than to producers, but consumer savings would probably result in better diets for the consumers and increased demand for food, thus benefitting the producers as well.

Municipal taxes and marketing charges compose a large proportion of the sale price of the less valuable farm products. The municipalities, of course, need sources of revenue, but taxes on production appear to inhibit production. Great changes are necessary before local governments can enact a land tax, as Saenz suggests for Costa Rica.[35] However, such a tax encourages land use rather than discouraging production.

While most of the communities visited had reasonably good access routes, two communities, Pajco and El Milagro, lacked a bridge--an obstacle to the profitability of the farm enterprises. In the first community costs for transporting the product to the road across the river, directly or indirectly, accounted for about 17 percent of the value of the product. There was no road to the village but this problem could probably be solved by the villagers if a bridge were built with outside help.

In El Milagro, any part of the cane crop not cut by the beginning of the rainy season had to be abandoned. The cost of transport

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[35]Carlos Saenz, "Population Growth, Economic Progress, and Opportunities on the Land: The Case of Costa Rica," Ph.D. Thesis, University of Wisconsin, Department of Agricultural Economics, 1969.

for both inputs and products is apparently an important cost in the thousands of communities accessible only by foot or animal transport.

The farmers could gain better incomes by extending their control over the product--selling it to the consumer rather than to merchants or truckers. Where the amount of the product is small, selling on an individual basis may not be economical because of transportation costs for both product and seller. In these cases cooperative selling could cut costs; for example, in Santiago S. or in San Juan S. the bus fare and market costs may exceed the value of the flowers if one bulto or less is produced per day. In Jocotillo and Almolonga, and to a lesser extent in Zunil, many growers own trucks and so cut transportation costs somewhat.

Agrarian Reform

Though only two communities visited can be considered major agrarian reform areas, small agrarian reform areas were encountered in four other communities. In one of the major regions farms were relatively large, from 10 to 40 hectares, while in the second major region farms consisted of about two hectares. In the other four communities the agrarian reform farms were generally less than two hectares.

Apparently a major cause of the less-than-complete success in the agrarian reform regions has been the selection of land recipients. Where former colonos (landless workers) received land, the proportion who succeeded in producing enough to have incomes as high as the community average, or even the proportion who have

survived as farmers, was not very high, though in most such cases the land received was of poor quality and the farms were very small. On farms of 20 hectares, reform beneficiaries exhibiting varying degrees of success were interviewed; owners who rented their land to others or left the land idle could not be located since they were seldom home. Evidence indicates that a major reason for such low levels of activity on these farms may have been a lack of sufficient working capital or credit to hire the machinery or labor necessary for production.

Basic requirements for land recipients under the land distribution programs of INTA are quite broad. The candidate must: 1) be a Guatemalan male between 18 and 60 years of age, exceptions to be made for immigrants specialized in certain crops or techniques; 2) be physically and mentally capable; and 3) not be an owner of substantial property nor be engaged in such commerce, industry, mining, or profession that would permit a high living level.[36] Those older than 60 are permitted to receive land if they have a son of working age but below 18. Race, religion, or other natural differences do not affect land reception rights.

Persons who meet the greatest number of the following conditions are preferred: 1) has knowledge of or experience in agriculture; 2) resides on or near the land to be acquired; 3) resides in a rural area; 4) has a family that depends economically upon him with preference to those having the greatest number of children; and 5)

[36] Instituto Nacional de Transformacion Agraria, Ley de Transformacion Agraria, Decreto 1551, Guatemala, 1964.

possesses tools, animals, or other elements appropriate for farming the land.

Variations from the basic requirements do occur. Apparently some individuals who were not Guatemalans have acquired land, especially in the parcelamiento Montufar where Salvadoreans have acquired land. Violation of the third requirement appears more common, since much land was given to professionals during the presidency of Armas, especially to members of the military and the secret police.

The five preferential conditions do not seem adequate for the situation either. Mere knowledge of or experience in agriculture scarcely appears sufficient; perhaps this qualification is too general and might better be phrased to include those with experience or knowledge of the <u>particular</u> type of agriculture appropriate to the region under consideration. For example, farmers (especially young farmers) from Almolonga would probably engage in vegetable growing if sold new land in the area, if markets are available, and if the new farm's size is not so large that they can shift to beef production.

Preference was generally given to people already living in the community, and these would most likely be able to adopt the farming practices most commonly used and apparently most appropriate to the region. On the other hand, the common practices of the area may not be fully appropriate, and individuals from other regions might be more receptive to new methods. Where no specific type of training was involved, the preference for natives of the region was probably suitable for the situation.

The preference for rural dwellers was not always met, nor was the requirement that the recipient have no other sources of income--the military recipients, for example, generally lived in the city.[37]

Preference for larger families has resulted in fragmentation of many parcels, even in the short time of twenty years. Some parcels are now occupied by forty or more people.

Adherence to the fifth preference--possession of tools, etc.--seems to violate the ideal of furnishing land to the most needy, but the preference has seemed beneficial from the viewpoint of production.

A common criticism of the agrarian reform recipients made by large landowners--even relatively liberal landowners--is that much of the land is not being cultivated. The administrators of the projects tend to exaggerate how much produce (especially corn) is shipped out of the area.

The farmers interviewed cultivated a large proportion of this land or used the land for pasture. This study did attempt to interview other farmers who lived on the land but who worked only a small proportion of their land and were less successful farmers. However, these farmers could never be found at home. One might easily judge these people as lazy or unambitious, but without knowing more about each situation such judgements are always too simplistic. Perhaps the principal reasons for apparent inattention to farming duties

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[37]The persons actually interviewed were active farmers with one exception, a merchant. It was not determined, however, if he was sold the land before or after he became a merchant. As noted, absentee owners could not be located or interviewed.

were really lack of financing for farming operations, physical disabilities, or similar problems. However, the land gained in agrarian reform obviously yielded little benefit to the individual farmer or to agricultural production in these cases.

Requirements for receiving land in the Peten appear calculated to eliminate the poor as prospects. The farm plans required of all recipients must be detailed and sophisticated to the extent that only highly educated persons could present them. Cooperatives are encouraged, but cooperatives of professionals and other financially well-to-do persons, not of peasants. Of course, these requirements stem partly from the necessity for capital intensive large scale enterprises believed requisite to develop this region. However, in some cases the activities of these groups infringe upon the rights of the small scale farmers and cattleman already operating in the region.

Several times in the past immigrants have been brought to Guatemala to serve as examples of family farmers, but never with any success. This demonstration process might be more successful if natives were used instead. This study indicates that some individuals, both indigena and ladino, are successful farmers. Not uncommonly the indigenas transfer their skills from advanced regions to other regions of the country--wheat growers from Quezaltenango are growing wheat in the Jalapa highlands, and merchants from Momostenango (Totonicapan) are operating stores in San Carlos Alzatate, also in the highlands of Jalapa in eastern Guatemala.

Land distribution programs could give major consideration to the sons in families now working small to medium sized plots of land. Young men in Almolonga, for example, could move to other regions where vegetable production is appropriate as regards soil quality, climate, and market possibilities. A continuing program could recruit such young men, typically after they have been married for a few years and have worked with their father or father-in-law (a somewhat more equal farming basis than that experienced by a single son). At such a time their ambition is probably at a peak, they have had some experience in farming, and their ideas about farming methods are probably somewhat flexible. They may need some training in the reasons why methods used in the home community need modification to adapt to the new environment.

Farm size in distribution programs should be flexible up to a maximum size, varying it according to the soil, climate, and type of farming most appropriate to a given region, and adjusting for the ability of the farmer and his family to work certain amounts of land.

Instead of trying to divide the existing farms in the present settlement areas into smaller units by decree, as proposed by the IICA-INTA study group, population increases could be allowed to resolve this problem within a few years. Attention then should focus on helping the farmers use more intensive methods of production to maintain income.

One must be pessimistic about the possible implementation of a meaningful agrarian reform. The cheap labor furnished by the landless and small farmers is too important to the influential

landowners for them to acquiesce in a sizeable reduction in this work force by means of agrarian reform. These people believe they will be protected by U.S. military forces should a widespread revolution take place. It is conceivable that a leftist military effort could succeed, in which case the land may be collectivized and the ideal of family farms will be even less realizable. As Dorner has said "under some circumstances progress may be impossible within the present system of institutions and political power."[38] Such circumstances appear to prevail in Guatemala at present, and that judgement agrees with Gollas', who said, "Guatemala seems to be trapped in a vicious circle where the government is the essential agent needed to bring about economic development, but simultaneously the same government is at the service of and is the instrument through which the minority who own the wealth of the country protect and increase their privileges."[39]

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[38]Dorner, "Popular Participation in Agricultural Development Programs," op. cit.

[39]Gollas Quintero, op. cit.

Appendix A

Background Information on Communities Studied

In order to place in perspective the communities selected for this study and their differences from traditional farm communities, the situation of traditional agriculture is briefly described below. The information presented here is largely gathered by means of mail questionnaires and preliminary visits to several areas.[1]

About 95 percent of Guatemalan communities grow corn as the principal crop, the chief exceptions being certain areas producing cotton, coffee, vegetables, or sugar cane. About three-quarters of the communities also produce black beans, the second staple food. Coffee is important on the Pacific slope and in Alta Verapaz, but is grown less extensively elsewhere. Wheat is raised in the western highlands but less extensively than corn. Potatoes are also produced in many areas of the highlands, but even less commonly than wheat. Vegetables are grown commercially in the fertile soil of several valleys; fruits in various highland areas. Platanos are grown in many areas but rarely in large acreages, while banana production is concentrated among large companies in the department of Izabal, largely for exportation. Sorghum is grown mostly in the dry eastern areas. Rice is grown chiefly in two departments, Izabal and Jutiapa.

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[1]For further information concerning the traditional agriculture of Guatemala, see George Hill and Manuel Gollas, The Minifundia Economy and Society of the Guatemalan Highland Indian, Land Tenure Center Research Paper No. 30 (Madison, The University of Wisconsin, July 1968); see also Schmid, op. cit.

In most of the highland communities the chief tool used is the azadon, a large hoe. Planting and harvesting are generally done by hand. There are some threshers and combines. however.

In most regions of Guatemala a farmer usually acquires land through inheritance from his father. Fathers may allow their sons the use of land or give it to them outright. Land purchase is also fairly common, perhaps more so than writings on the traditional Indian societies of Guatemala lead one to believe. Cash renting is common in many areas, though less so in the traditional Indian regions; share-cropping occurs most commonly in the eastern part of Guatemala.

Several thousand farmers live in agrarian reform projects, the largest dating to the Armas era, but many smaller areas scattered throughout the country date back to the Arbenz era, even though the beneficiaries may have changed with the government. Squatting is of minor importance in the settled regions. Communal land owned by governmental units or by Indian communities (or less commonly, ladinos), is quite important in many regions; however, in only a few cases is the land operated communally. Usually the land is distrib uted by the community and farmed individually by the recipients.

Since no appreciable rain falls in most of Guatemala for about six months of the year, springs, rivers, or other sources of water become very important for producing during the dry season from November to April. Farmers in some regions use these sources of water; residents in other regions do not. A very important considera-tion for agriculture, therefore, is the development of the irrigation possibilities, either by the farmers themselves or by public agencies.

Extension agents are spread very unevenly throughout Guatemala, with only about 40 regular agents, the majority of these devoted to the departments of Zacapa and Izabal where the most guerrilla activity has occurred. However, a separate division of the extension agency, the Servicio de Fomento de Economia Indigena (SFEI), serves the highlands, with 33 agents in this region. Because of the large number of farmers, the extension agents do not travel to villages which cannot be reached by jeep, and low budgetary allowances for gasoline limit the amount of service even to accessible villages.

A rather small proportion of Guatemalan farmers are able to obtain credit. The most common source of credit is private moneylenders; banks and even the supervised credit agency prefer to lend only to the larger operators. The interest rate on moneylender credit is difficult to ascertain, but it is generally said to be 3 to 5 percent monthly.

A very high proportion of farms can be reached only by paths which cannot be travelled by all types of vehicles. The majority of the farmers must travel to their farms by foot, while a minority (usually the less poor) use horses or mules. Much of the farm products must be carried on the backs of either men or horses, not only from the fields, but also to market, though in some regions oxcarts are used.

The community itself forms the principal market for farm products in a majority of villages. In a minority of communities the chief market is the municipal seat and in still fewer the capital or other cities.

Appendix B

Methodology

First, persons concerned with the transformation of agriculture were interviewed informally, including officials of agricultural extension, supervised credit, and national planning offices, and the national agrarian institute. These interviews had two objectives--to determine what was being done to promote the transformation of traditional agriculture, and to determine where in Guatemala the largest concentrations of family farms existed, defined by previous studies as between 7.0 and 45.1 hectares (17.5 to 112.5 acres).

Examination of census data[2] concerning farm size by municipio revealed that most of those municipios with a substantial proportion of the land area in farms of the family farm size range were in the highlands--the very regions from which the majority of the migratory workers come, indicating an extreme shortage of cultivable land in these areas. Visits to the areas confirmed the belief that census information was of little value for determining effective farm size, since this size depends upon the amount of cultivable land available and the quality of this land, rather than upon total farm size.

Questionnaires were sent to the mayors of all municipios in Guatemala, to all rural cooperatives and extension agents, to most

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[2]The census bureau had not yet published the 1964 census at this time. However, the bureau permitted access to the data upon assurance that the figures would not be published.

of the promotores sociales and promotores bilingues,[3] and to a sample of rural school teachers. These questionnaires were all similar in purpose, trying to obtain information concerning crops grown, farming methods used, prevalence of family size farms, and major obstacles encountered in farming activities--background information for the selection of regions to be included in the study. The questionnaires were, however, adapted to the expected knowledge level of the respondents.

Finally, a detailed questionnaire was developed and administered to 117 individual farmers on farms of different sizes in various parts of the country. The specific selection of communities and individuals to be interviewed is detailed below.

Selection of Communities

Given the background knowledge of Guatemalan agriculture gathered (described briefly in Appendix A), the selection of the actual sample was influenced by several factors:

1) production of commercial crops;

2) geographic location;

3) climate;

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[3]The Instituto Indigenista provided an incomplete list of these individuals. Promotores sociales and promotores bilingües are rural people brought to the city of Guatemala by the Universidad Landivar, the Catholic University, and trained for a short period of time. The promotores sociales return to their villages to promote co-operatives, better farming methods, etc., and the promotores bilingües become adult literacy teachers.

4) crops grown;

5) prevailing language of the region;

6) prevailing land tenure type;

7) resources and services available

Each factor is described for each sample area in Table A-1 except for the production of commercial crops, which is common to all of the areas--all the areas were chosen because a large proportion or a majority of the farms in the area were producing commercial products. Corn is produced in every or nearly every municipio of Guatemala, but in relatively few as a commercial product. Montufar is included as representative of commercial corn producing areas.

The communities visited can be classifed geographically into four general regions of the country: 1) Central highlands; 2) Western highlands; 3) Southern coastal; and 4) Eastern valleys. The location of the 17 aldeas or municipios represented in this study is shown on Map A-1.

Although all the men interviewed were able to understand Spanish fairly well, the study included areas in which the five different Indian languages still prevail (see Table A-1). However, the two regions speaking Mam or Chorti also speak Spanish well and are adopting ladino dress and customs; the other Indian-language regions remain more traditional.

In most of the areas, control of land was achieved large through inheritance and purchase. The regions of Cuyuta, El Milagro, and Montufar were included partly because they are parcelamientos created by agrarian reform; small parcelamientos were also encountered in five other areas. Table A-1 shows land tenure forms prevalent in

Table A-1. Comparison of Certain Characteristics of Communities in which Farmers were Interviewed

Community	No. Cases	Dis-tance[a]	Temp.	Pre.	Farm Products[b]	Lan-guage	Land tenure	Water	Ex-tension
Palencia	16	20-25	mod.	mod.	gu/bot	Sp.	o/r/s	pc/pr	My/Ag
Jocotillo	12	29	warm	mod.	ppl/cf	Sp.	o/r/s	-	-
St. Elena B.	7	26	warm	mod.	coffee	Sp.	o/r/s	-	My/Ag[c]
San Juan S	9	16	cold	mod.	flowers	Ck.	o/r	pr	-
Santiago S.	8	15	cold	mod.	veg.	Ck.	o/r	-	-
San Lucas S.	4	14	cold	mod.	veg/fruit	Ck.	o/r	pc[d]	-
San Bartolome	3	15	cold	mod.	fruit/veg.	Ck.	o/r	-	-
Ovejero	4	94	warm	mod.	tobacco	Sp.	o/r	-	Tob/Co
Monjas	5	100	warm	mod.	tobacco	Sp.	o/r	-[f]	Tob/Co
Teculutan	4	72	hot	dry	to/cu	Sp.	o/r/s	pr	My/Ag Coop
Pajco	7	120	hot	dry	to/pep	Ch/Sp	o[e]	co	Bg/pts
Cuyuta Milagro	7	42-50	hot	high	su. cane	Sp.	o/r	-	-
Montufar	10	102	hot	high	cn/sg/milk	Sp.	o/r	-	PC
Aguacatan	8	170	cool	high	garlic	Ag	o/r	pc	SFEI
Chiantla	2	170-183	v.cold	"	pot/wheat	Mam/Sp	o/c	-	SFEI
Zunil	6	112	cool	high	veg.	Qu.	o/r	pr	-
Almolonga	5	116	cool	high	veg.	Qu.	o/r	pr	-

[a]From the capital city.
[b]In addition to corn for subsistence.
[c]Visits aldea at most once weekly.
[d]One case only.
[e]The land is owned but it is not surveyed nor registered
[f]A fairly large scale irrigation project is underway to irrigate much of the valley of Monjas

(See following page for key)

Key to abbreviations used in Table A-1

gu - guisquil
pot - potatoes
ppl - pineapple
cf - coffee
veg - vegetables
to - tomatoes
cu - cucumbers
pep - peppers
sg - sorghum
cn - corn
su. cane - sugar cane

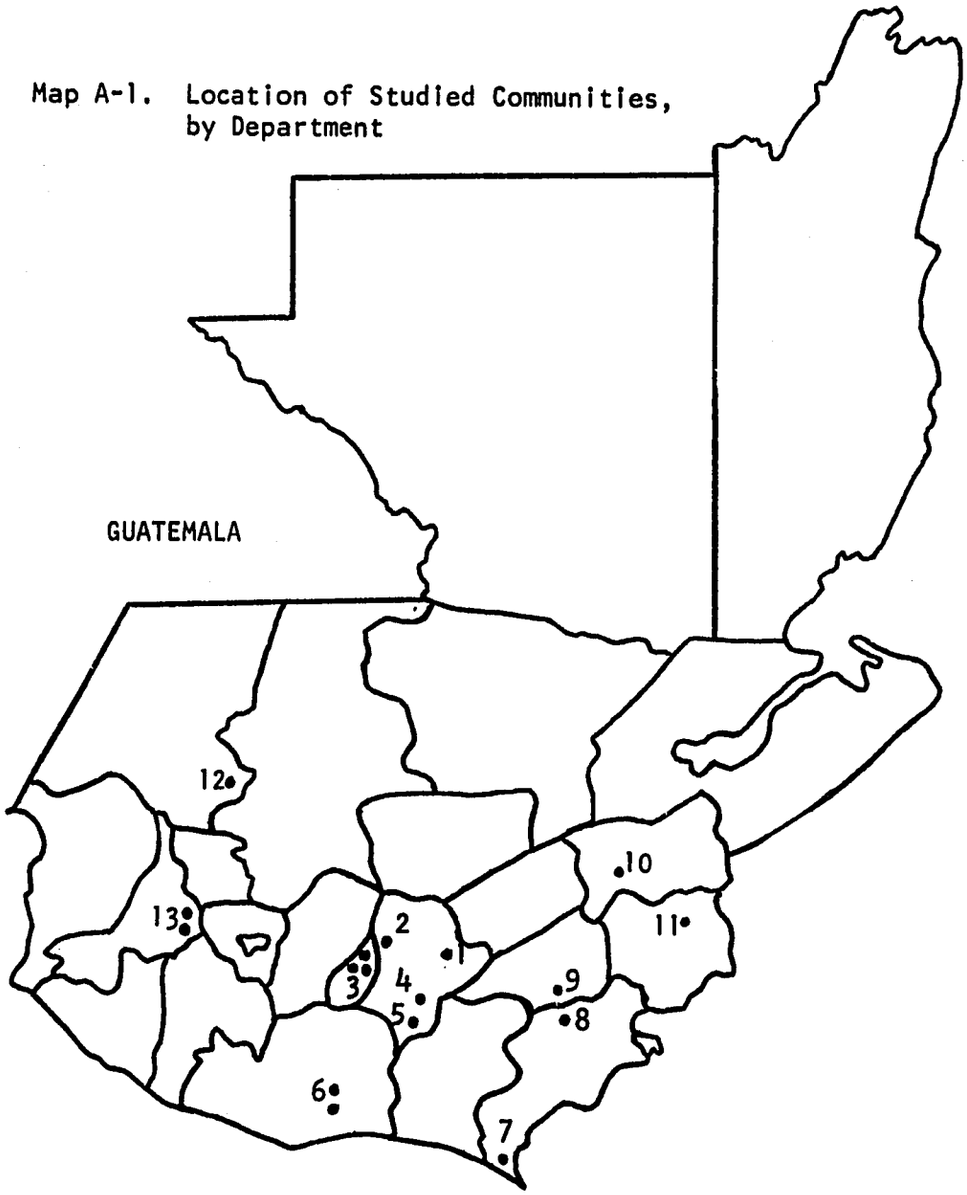
Sp - Spanish
Ck - Cakchiquel
Ch - Chorti
Ag - Aguateca
Qu - Quiche

o - own
r - rent
s - sharecrop
c - communal

pc - public
pr - private
co - cooperative

My/Ag - Ministry of Agriculture
Tob/Co - Tobacco Company
Bg/pts - Belgian priests
PC - Peace Corps

Map A-1. Location of Studied Communities, by Department



1 - Palencia (includes aldeas, San Sur and Los Mexcos), Guatemala
2 - San Juan Sacatepéquez, Guatemala
3 - Santiago Sacatepéquez, Sacatepéquez
- San Lucas Sacatepéquez, Sacatepéquez
- San Bartolomé Sacatepéquez, Sacatepéquez
4 - Santa Elena Barrillas, Villa Canales, Guatemala
5 - Jocotillo, Villa Canales, Guatemala
6 - El Milagro, Masagua, Escuintla
- Cuyuta, Masagua, Escuintla
7 - Montufar, Jutiapa
8 - El Ovejero, El Progreso, Jutiapa
9 - Monjas, Jalapa
10 - Teculután, Zacapa (includes Usumatlán)
11 - El Pajco, Camotán, Chiquimula
12 - Aguacatán, Huehuetenango
13 - Almolonga, Quezaltenango
- Zunil, Quezaltenango

each area (also, a few parcels included in the study were occupied by squatters in El Milagro).

Finally, in terms of resources and services, the most important was the availability of water during the dry season. Palencia and Almolonga are fortunate to be watered by springs, while in Zunil and Teculutan, water is diverted from rivers. In La Cruz Blanca, the production of flowers in the dry season is maintained with the aid of water drawn by bucket from shallow wells. In the aldea of Pajco, a fairly large cooperative irrigation project was completed by the farmers in order to produce during the dry season.

Table A-1 notes available extension services, but it should be added that Teculutan was specifically chosen as a region in which success was attained in organizing and operating a cooperative entirely through the efforts of the local residents.

The location of the farm home in relation to the farm land was difficult to determine as a prevailing feature in each community; therefore Table A-1 does not include this information.

All the selected communities were accessible by jeep except Pajco. Since communities qualified for inclusion in the study only if they raised commercial farm products, communities with roads were more likely to be selected.

Selection of the Farms

Two criteria were used for selecting the 117 farmers interviewed in the selected communities: 1)that they produce crops other than corn; and 2) that the farm not be extremely small nor extremely large.

No lists of farms by size and no plat maps could be found Therefore, it was necessary to depend upon the advice of alcaldes, school teachers, priests, or others to locate farmers for interviews. Often, the persons consulted sent the interviewers to farmers with extremely small or large farms Thus the farm sizes were not always chosen as intended and the size of the farms cultivated by the interivewed farmers varied widely. However, the most land cultivated by any one farmer was 19.6 hectares (48.4 acres)

It was very difficult to find farmers who were not too busy to be interviewed; most work at least ten hours a day. Too, it was difficult to finish an interview after the farmers had quit work for the day, as the questionnaire took one and one-half to two hours. Some interviews were completed by kerosene lamplight.

Another problem was the eluctance of the farmers to be interviewed by strangers, especia with a long questionnaire, and particularly in the Indian areas. This reluctance is understandable in view of the past history of Guatemala and of the tensions which existed at the time of the interviewing, but this situation influenced the representativeness of the sample and made interviewing difficult.

Apparently the number of interviewees with non-agricultural income is disproportionately high. Perhaps persons with other types of work, especially storekeeping, might have more time for interviews since they do not work as much on their farm. Also, persons with other sources of income, again especially storekeepers, have more contact with outside persons and may be more willing to talk to strangers. In some areas mostly the better farmers were interviewed because poorer farmers were absent from their farms.