LAND AND LABOR IN GUATEMALA: AN ASSESSMENT

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PREFACE

A few prefatory words are in order to introduce this study, Land and Labor in Guatemala: An Assessment.

The study was accomplished by a six-man team over a two month period from August 1 to September 30, 1962. The team was composed of three career AID officers, Richard Hough, John Kelley and Steve Miller, and three contract professionals from Development Associates, Russell DeRossier, Fred L. Mann and Mitchell A. Seligson.

The study was requested by USAID/Guatemala in March of 1982; its scope of work was approved by the Government of Guatemala and the USAID before the arrival of the team in Guatemala on August 1. The study was written entirely in Guatemala, and was completed and submitted to the USAID on September 24, 1982. The Spanish version was presented to the Government of Guatemala in October of 1982.

The purposes of the study were essentially two. First, the team was asked to do an in-depth, comprehensive assessment of "agrarian transformation" programs and conditions in Guatemala, from both a contemporary and historical perspective, and, second, to include in its findings a prospective set of suggestions for further actions by the Guatemalan government. The Minister of Agriculture, Ingeniero-Agronomo Leopoldo Sandoval Villeda, also requested

that the team include in its analyses specific data in particular areas such as the amounts and quality of land available for distribution within the present Guatemalan legal framework, and the size of the universe of landless population in Guatemala; and to include as well the team's suggestions for changes in current Guatemalan agrarian reform laws. Needless to say, as available data and time allowed, the team sought to meet both the broad and specific substantive demands placed upon it.

The members of the team brought to bear on the assessment a broad array of professional skills and experience in agrarian change and related fields. Mr. DeRossier is a field crop specialist of forty years experience in Central America. Professor Mann from the University of Missouri is an agricultural economist with a broad sector analysis background in agriculture who had also done extensive previous professional work in Guatemala. Professor Seligson from the University of Arizona is a political scientist and area specialist in Central America who has been deeply involved in research and writing on agrarian reform for a number of years particularly in Costa Rica. John Kelley is a social antropologist and computer data processing specialist with extended AID field research and program experience in agrarian change and related fields in Honduras and Guatemala. Steve Miller is an AID rural development officer who had previously served as a Peace Corps Volunteer in Guatemala, 1976 - 1978. Richard Hough is an AID officer with a broad background in agrarian reform programs in numerous other Latin American and Asian countries.

The members of the team did not limit themselves to research and writing in Guatemala City. Several field trips were taken by team members to various regions of Guatemala, such as the Franja Transversal del Norte, El Peten, the Baja Sur and the Boca Costa. The team also sought to the greatest extent possible to use primary source data in its analyses, principally the Guatemalan population and agricultural censuses collected since 1950, reports and archival material provided by the Instituto Nacional de Transformacion Agraria (INTA), and field interviews with knowledgeable Guatemalans.

The assessment could not have been accomplished without the considerable assistance of numerous other people who freely gave of their time and support in a multitude of different ways.

On the Guatemalan side, the Minister of Agriculture on two separate occasions courteously and patiently submitted himself to prolonged question and answer sessions with the members of the team. His interest in and support of the study were very much appreciated by the team. There were also officials in INTA and the Guatemalan Census Bureau (Direccion General de Estadistica), to numerous to mention individually, who provided access to the documents we needed, as well as answered all our questions, who deserve special thanks.

On the American side, we would be very remiss if we did not make special mention of the services and contributions rendered to the team by David Thompson, AID employee in the Rural Development Office of the USAID. Mr. Thompson was assigned to act as the control officer to the team for the duration of its work in Guatemala. In effect, he functioned as an additional

member of team, allowing us to tap freely his extensive eleven year experience in rural development and land resettlement in Guatemala, as well as providing countless services for team members, inter alia, arranging field trips, access to government officials and transportation.

We would also like to make particular note of the important contributions made to the study by David Fledderjohn of Agricultural Cooperative Development International (ACDI), regional cooperative advisor to USAID Missions in Latin America and the Caribbean. Mr. Fledderjohn most kindly gave the team two weeks of his professional time, providing us with invaluable background, specific program ideas, as well as the benefit of his keen perceptions of Guatemalan realities.

We would also like to acknowledge the support the team received from various members of the US Mission: Ambassador Chapin for the promptness and substance of his comments on the initial draft; Peter Kolar, the Acting USAID Director, for the access and help he provided the team leader; Larry Laird and Cecil McFarland, the two Chiefs of the Rural Development office while the team was in Guatemala, who provided unfailing support; Mrs. Miriam Belcher and Mrs. Angie Castro, our two secretaries, who provided the team skilled and yeoman service, to say the least; and Mrs. Regina Lainfiesta, our expert translator who turned out an excellent Spanish version of the study in such a short time.

Last, but certainly not least, we would like to note the excellent support the team received from AID/Washington and Development Associates from inception to completion of the study. On the Development Associates side, the alacrity and persistence displayed by Jack Sullivan, Vice President of International Activities, and his associate Ms. Nancy Jaffee, in recruiting the contract members of the team were especially noteworthy. In AID/Washington, we would like to acknowledge particularly our appreciation of the constant and detailed support provided by Rich Owens in the Rural Development Office of LAC, as well as the initial inputs to and continuing support of the team's efforts by Marvin Schwartz, the Desk Officer for Guatemala and Scaff Brown and Wayne Nilestuen, the Chief and Deputy Chief respectively of the Rural Development Office.

We thank all of you.

PART ONE: LAND AND LABOR IN GUATEMALA: THE UNBALANCED EQUATION

A. Approach to the Problem

This report examines, from a macro-perspective, the man-land equation in Guatemala in both an historical and contemporary framework and attempts to highlight the character of this equation and the disequilibria which emerge from the data and analysis. The report makes extensive use of data gathered from several sources, the most important of which are the population and agricultural censuses collected since 1950, reports and archival material from the Instituto Nacional de Transformacion Agraria (INTA, Guatemala's rural settlement and colonization institution), and numerous documents and studies dealing with land quality and land tenancy in Guatemala. The volume of material available is considerable and, given the paucity of serious studies on the subject in English, surprised the assessment team both in terms of its quantity and quality. Within the limits of the team's time and resources, it became our task to organize, synthesize, and interpret the data.

The report is organized in four parts. The first examines the relationship between land tenancy patterns and landlessness. Part Two explains how the characteristic patterns and disequilibria uncovered in Part One occurred and documents governmental efforts to deal with the major problems, which manifested themselves through various efforts in agrarian reform and land colonization.

Part Three examines some options which the government of Guatemala might consider as components of a future program effort in agrarian change and development; and Part Four contains various annexes developed for and used in the analytical work of the study, including a complete set of tables, explanations of the methodology used, and three substantive and technical papers on the land and soils of Guatemala and alternative agrarian reform strategies.

B. Land Tenancy in Guatemala: The Contemporary Picture

Guatemala, not unlike many other countries in Latin America, is characterized by striking inequalities in the distribution of land. The situation here, however, is more serious than in all other countries in Central America and most other Latin American countries. The most common index of inequality is the Gini coefficient, which ranges from a low of zero in a situation of theoretically perfect equality to a high of 100 in a situation of theoretically maximum inequality. In 1979, the Gini coefficient for Guatemala was 85, higher than all but two Latin American countries: pre-reform (1961) Peru, 93.3, and pre-reform (1964) Colombia, 86.4.

TABLE 1. LAND CONCENTRATION IN GUATEMALA: 1964 and 1979
GINI INDICES*

Departments	Gini Index	
	1964	1979
National Index	82.42	85.05
Guatemala	82.08	85.90
El Progreso	77.90	81.75
Sacatapequez	68.87	73.25
Chimaltenango	78.21	80.39
Escuintla	91.95	91.97
Santa Rosa	86.32	86.64
Solola	63.03	67.68
Totonicapan	60.93	61.78
Quetzaltenango	82.90	87.41
Suchitepequez	91.76	93.58
Retalhuleu	91.12	90.75
San Marcos	73.08	75.92
Huehuetenango	71.29	69.70
El Quiche	68.13	72.86
Baja Verapaz	79.92	82.25
Alta Verapaz	85.20	82.88
El Peten	67.17	68.72
Izabal	89.31	83.65
Zacapa	83.41	86.67
Chiquimula	70.53	71.64
Jalapa	77.39	74.46
Jutiapa	75.91	75.82

Source: Computed from 1964 and 1979 agricultural census.

* The Gini Index or Gini Coefficient is a measure of the concentration of resources. When applied to land, the Gini index is based on two variables: farm size and amount of land. The number of farms in each farm size category is compared to the amount of land in each category. In a perfectly equal distribution, the Gini Index would equal 0. The higher the index (100 is the theoretical maximum), the greater the concentration of land in larger farms.


PRINCIPAL CITIES
GUATEMALA
Scale of Miles
10 20 30 40 50
MAP NO. NA9
LEGEND
National Capital
Capital of Department
POPULATION KEY
Over 100,000
50,000 to 100,000
25,000 to 50,000
Under 5,000
15,000 to 25,000
10,000 to 15,000
5,000 to 10,000
EL PETÉN
BRITISH HONDURAS
MEXICO
HUEHUETENANGO
ALTA VERAPAZ
IZABAL
EL QUICHÉ
SAN MARCOS
BAJA VERAPAZ
ZACAPA
EL PROGRESO
QUEZALTENANGO
SOLOLA
CHIMALTENANGO
GUATEMALA
JALAPA
CHIQUIMULA
RETALHULEU
SUCHITEPÉQUEZ
SANTA ROSA
JUTIAPA
ESCUINTLA
PACIFIC OCEAN
HONDURAS
EL SALVADOR
CLEARTYPE® MAP
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Guatemala's land distribution is more skewed than its neighbors. Pre-reform Nicaragua (1963) and pre-reform El Salvador (1961) had Gini cofficients of 80.1 and 82.7, while Costa Rica's (1963) was a 78.2 , Honduras' (1961) was 75.7, and Panama's (1961) was 73.5. This compares with an average Gini coefficient of 67.0 in 67 developing countries (Taylor and Hudson:1972).

The 1971 Salvadoran agricultural census reported that 48.9 per cent of all farms were smaller than one hectare, and occupied only 4.8 per cent of the land in farms. In Guatemala, as detailed below, farms smaller than 1.4 hectares (precise size range equivalent comparisons with the El Salvador data are not available) total 54.2 per cent of the farms and 4.1 per cent of the farmland. Thus, the prevailing pattern of minifundios in El Salvador in 1971 was nearly identical to that of Guatemala in 1979. In El Salvador, however, the agrarian reform programs initiated in 1980 have reduced the extent of land concentration. Honduras, Guatemala's other Central American neighbor, exhibits a much lower incidence of minifundization of farm land than either pre-land reform El Salvador or contemporary Guatemala. Only 9.9 per cent of the farms in Honduras are less than one hectare (Durham, 1979).

A more detailed examination of the Guatemalan census data graphically reveals the extent of land concentration in this country. The basic data come from the agricultural censuses conducted in 1950, 1964 and 1979. These censuses are notably different. While the reliability and coverage of all three must in some measure be discounted[1], the overall pattern is clear and consistent. The basic information is summarized in Tables 2A and 2B which display the distribution of farms by size category.

TABLE 2A. LAND DISTRIBUTION IN GUATEMALA: 1950, 1964, 1979*

	Number of Farms			Area (hectares)		
Size	1950	1964	1979	1950	1964	1979
Less than (LT).7 hect.	74,269	85,083	166,732	28,575	32,678	55,430
.7 to LT 1.4 hect.	91,581	98,658	121,351	94,554	95,428	115,116
1.4 to LT 3.5 hect.	99,779	129,115	128,587	212,090	270,693	267,902
3.5 to LT 7 hect.	42,444	52,023	51,798	197,911	242,833	240,142
7 to LT 22.4 hect.	26,916	37,025	40,378	310,915	446,564	497,858
22.4 to LT 44.8 hect.	6,125	6,631	9,131	189,916	203,508	283,158
44.8 to LT 450 hect.	6,488	7,859	12,297	813,262	915,079	1,281,854
450 to LT 900 hect	569	561	880	354,270	345,739	535,630
900 to LT 2,250 hect.	358	294	388	495,508	387,093	501,714
2,250 to LT 4,500 hect.	104	56	75	327,649	169,747	227,156
4,500 to LT 9,000 hect.	32	30	15	196,333	178,448	88,663
9,000 and larger	22	9	4	499,848	160,927	85,623
TOTAL	348,687	417,344	531,636	3,720,831	3,448,737	4,180,246

* The census of 1950 eliminated all farms of less than .04 hectare (i.e., una cuerda), whereas the 1964 census established no lower limit. The 1979 census recorded all farms irrespective of size, but at the time of the compilation of this study the data for farms of less than .04 hectare had not yet been processed. It is understood that there are approximately 70,000 farms of this size, yielding a maximum estimated total of 3,043 hectares of land.

This table with citation of sources and further information is repeated in Annex 1.

TABLE 2B. LAND DISTRIBUTION IN GUATEMALA: 1950, 1964, 1979*

(expressed in percentages)

	Number of Farms			Area (hectares)		
Size	1950	1964	1979	1950	1964	1979
Less than (LT) .7 hect.	21.30	20.39	31.36	0.77	0.95	1.33
.7 to LT 1.4 hect.	26.26	23.64	22.83	2.54	2.77	2.75
1.4 to LT 3.5 hect.	28.62	30.94	24.19	5.70	7.85	6.40
3.5 to LT 7 hect.	12.17	12.47	9.74	5.32	7.04	5.74
7 to LT 22.4 hect.	7.72	8.87	7.60	8.36	12.95	11.91
22.4 to LT 44.8 hect.	1.76	1.59	1.72	5.10	5.90	6.77
44.8 to LT 450 hect.	1.86	1.88	2.31	21.86	26.53	30.66
450 to LT 900 hect	.16	.13	.17	9.52	10.03	12.81
900 to LT 2,250 hect.	.10	.07	.07	13.32	11.22	12.00
2,250 to LT 4,500 hect.	.03	.01	.01	8.8	4.92	5.43
4,500 to LT 9,000 hect.	-	-	-	5.28	5.17	2.12
9,000 and larger	-	-	-	13.43	4.67	2.05
TOTAL	99.98	99.99	100.00	100.01	100.00	99.97

* The census of 1950 eliminated all farms of less than .04 hectare (i.e., una cuerda), whereas the 1964 census established no lower limit. The 1979 census recorded all farms irrespective of size, but at the time of the compilation of this study the farms of less than .04 hectare had not been processed. It is understood that there are approximately 70,000 farms of this size for an estimated total of 3,043 hectares of land.

This table with citation of sources and further information is repeated in Annex 1.

In the 29 years which elapsed between the first and most recent agricultural censuses, the proportion of the nation's land in farms has increased only slightly. In 1950, 34 percent of Guatemala's approximately 10.8 million hectares of land was in farms, whereas in 1979 the land in farms had only increased to 39 percent[2]. In 1950, the 3.7 million hectares of land in farms were distributed in 348,687 farms. By 1979, this had increased to 4.2 million hectares of farm land in 531,636 farms. The number of farm owners in the country is less than the number of farms because an individual may own more than one farm, a fact which is not considered by the census. Ownership of multiple farms by a single individual is quite uncommon among very small landholders, whereas large estate owners often own several farms.

In Guatemala, most farms are small. In 1950, 76 percent of all farms were less than 3.5 hectares in size, while in 1979 this figure had risen to 78 percent. These farms contained only nine percent of the land in farms in 1950 and ten percent in 1979 (see Table 2B). According to the standard classification employed in most studies of land tenancy in Latin America (see Table 2C in Annex 1), 88 percent of all Guatemala's farms in 1979 were of sub-family size (i.e., too small to provide for the needs of a family). These farms possessed only 16 percent of the land in farms. At the other extreme, farms of 450 hectares and larger, amounting to less than one percent of the farms, contained 34 percent of the land in farms.

The pattern of land concentration is exacerbated by greater skewing of the distribution in areas of the country in which the best farmland is located. In the coastal departments of Suchitepequez, Izabal, and Escuintla, which contain 49 percent of all Guatemala's Class A land, farms of 450 hectares or

larger account for 53 percent, 49 percent and 59 percent, respectively, of the land in farms as compared to the national total of 34 percent. In sum, Guatemala is a country in which the vast majority of farms are very small, while a small number of farms occupy a large proportion of the best farm land in the country.

In addition to the problem of land concentration, Guatemala suffers from the problem of indirect tenancy. 76 percent of the farms are considered as being owned directly by their producers. The remaining farms are rented, sharecropped, farmed under the colono system[3], or held in some combination thereof.

Indirect tenancy arrangements in Guatemala are varied, depending upon the region, quality of the land and idiosyncratic features growing out of the nature of the personal relationship that tenants have with landowners. It is common in Guatemala to require that tenants pay for the use of the land in three separate ways. First, tenants are required to deliver to the owner a certain agreed upon proportion of the crop. In the South Coastal region, for example, it is common to require payment of two quintales of corn per hectare. Second, tenants are usually required to leave the land planted in pasture. Third, the tenant may be required to work on the owner's farm at a wage below the legal minimum (CIDA, 1965:73).

The problem of indirect tenancy in Guatemala is magnified because it affects the smallest producers most heavily. For the country as a whole, only ten percent of the land area in farms in 1950 and 11 percent in 1979 was not owned directly. While this is a relatively small amount which is held in indirect forms, indirect tenancy is concentrated in the smallest farms where almost 30 percent of the land is not farmed by its owner (Table 4).

The data on ownership in Table 4 do not present the whole picture. While 90 percent of Guatemalan landholders own their own land, the census makes no distinction between land with secure title and land for which there is only traditional usufruct rights.

From our understanding of the titling system in use in Guatemala, large numbers of small landholders cannot afford or have been unable to have their farms surveyed and titled in the national land registry. As a result, prior claimants of the land can, and do, demand the right to repossess their land, even if they have not lived there for extended periods. Smallholders confronted by such demands are often forced to either abandon their farms to the claimant or to attempt to purchase the land from him. Smallholders do not have the funds to sustain a protracted court battle over possession.

In sum, many rural Guatemalan smallholders are plagued with the insecurity of knowing that at any time they could be forced off their land.

C. The Landless Population

The population of Guatemala has been growing at a rapid rate, as can be seen from Table 5 (in Annex 1). In 1950 there were 2.8 million Guatemalans, in 1964 4.3 million, in 1973 5.2 million, and the projections for 1981 report 7.477 million people. Population growth in Guatemala is indeed at the very high rate of 3.2 percent per annum which means the population will double in 22 years.

We define the landless population as that proportion of the population which is in the agriculture labor force but does not own or manage land and is

employed in farming activities. Two alternative calculations of the size of the landless population are made: one with all farm laborers and one which excludes those with permanent employment.

In order to determine the landless population, it was necessary to make some projections from the 1973 population census, using the overall 1980 population census figures as a benchmark because this census has not yet been fully processed. In 1973 the economically active population in agriculture 10 years and older (the Guatemalan census definition) was 875,910 persons (see Table 6 in Annex 1). Excluding those too young to manage their own farms, this figure is reduced to 439,955 adult landless laborers in Guatemala in 1973 (see Table 7 in Annex 1). Projections at this figure with the preliminary 1980 census returns yields an estimated number of economically active landless agricultural workers of 419,620. If we further reduce the size of the landless work force by not including those who have steady year-round jobs on large farms the calculation yields an estimated 309,119 economically active landless workers in agriculture in 1980.

D. Land Potentially Available for Distribution

We now calculate the amount of land which is potentially available for distribution at the current time. Our principal assumption is that the amount of land available should be calculated within the framework of the existing legislation (see Part 2, Section D for a discussion of this legislation).

While changes may be contemplated in the legislation, our analysis of land availability is based on the assumption that the legislation will not change. Thus, our description here is based not on de facto but de jure agrarian transformation processes.

1. The Legal Context

Current legislation provides for distribution of two principal categories of land: unused land which is in the public domain (terrenos baldios) and idle land (tierras ociosas) which is currently in farms. Idle land is defined as land in private hands which is uncultivated or which is undergrazed according to a complex cattle to land ratio. Portions of this land are subject to expropriation under certain conditions. The law provides for a tax incentive designed to encourage owners of idle land to either put it into production or to sell it (see Part 2-D).

The idle land provisions of the law are infrequently applied. In 1981, INTA records show that total income from the idle lands tax amounted to only Q. 22,405.04. Based on the 1979 agricultural census figures showing idle lands of approximately 1.2 million hectares, the minimum potential idle land tax exceeds Q.900,000.

2. De Jure Land Availability

We determined the amount of land potentially available for distribution by comparing actual and potential land use. The 1979 Agricultural Census reports

both total area in farms and the amount of land used for annual crops, perennial crops, pasture, forest, and other types of land. We have defined land in use as the sum of annual, perennial, and pasture land. Unused farm land (ociosa) includes forest and other categories.

Potential land use is based on data reported in an extensive soils assessment conducted by Bovay (see Table 8A and B, Annex 1). Land is classified in eight categories, as follows:

TABLE 8 A - LAND USE POTENTIAL

CLASSIFICATION		DESCRIPTION
Bovay	INAFOR[1]	
A	I	Agricultural lands suitable for intensive cultivation, with little or no limitation; areas with slopes of less than 4%. Suitable for irrigation.
B	II	Lands suitable for intensive cultivation with little limitation; areas with slopes of less than 8%. Limitations imposed by the need to take precautions against erosion. Suitable for irrigation.
C	III IV	Lands requiring feasibility studies to determine whether they may most suitably be used for agriculture (perennial crops), pasture or forestry. Severe limitations imposed by the need to take precautions against erosion. Irrigation possibility limited.
D	V	Lands mostly adapted to forestry, varying in topography from steeply sloping to severely dissected. Soils shallow and seriously subject to erosion. Small pockets of soil suitable for agriculture may be found in valleys and depressions but must be handled with extreme precautions against erosion.

E	VI	Lands limited to forestry by this extremely broken topography, thin and eroded soils. Mostly deciduous.
F	VII	Swampy and flooded lands under water a good portion of the year.
G[2]	VIII	Forests located on extremely broken topography with thin and eroded soils which must be preserved to protect watersheds and to avoid the destruction of soil and water resources and to protect fragile ecosystems.

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1) Instituto Nacional Forestal
2) Includes wetlands.

This study also develops a methodology for converting soils of different types to their equivalent in first-class agricultural land, providing a standard unit of measurement. The distinction between actual hectares of land of different soil types and First Class Equivalent (FCE) units must be kept clearly in mind throughout the following discussion. When we analyze existing patterns of land use, we use actual extension in hectares. When we analyze potential availability of land, we convert land of different soil types into FCE units in order to provide a standard unit of measurement. (See Annex 2 for discussion of the methodology employed).

We calculated the amount of land available for distribution at the departmental level using a fairly complex technique. The total area of land in farms and the total arable area is calculated. Unused public domain land is the land that remains after subtracting land in farms from the sum total of arable land. This unused public domain land is then converted to First Class Equivalents with the conversion ratios. The result is an estimate of the number of FCE units of unused public domain land (baldio) available for distribution. Obviously, in a department where the area in farms exceeds the arable surface, there is no baldio land available.

Second, the total area of unused farm land (ociosa) is calculated by comparing the amount of farm land in use in the department to the sum total of arable land. If the amount in use exceeds arable land, the department is considered to be overutilized and thus no idle farm lands are available for distribution. If the arable amount exceeds the amount in use, it is converted to FCE units. We assume that this land has the same mix of soil types as the unused land in the department, and thus calculate FCE units using the same ratio of soil types.

The calculations of unused public domain land and idle land were done with three different sets of assumptions about the amount of land that is defined as arable. Under Option 1, arable land includes only first class, second class, and multiple use land. Under Option 2, Karst forest land (described in Part I. D-3) is considered to be arable. Under Option 3, swamp and wetlands are considered to be potentially arable, though major investments in water resources management and infrastructure would be required to make this in fact the case.

Specific mention should be made of the potential amount of land available for distribution in El Peten, since this is widely considered to be the principal remaining frontier area in Guatemala. Our treatment of El Peten is based on data reported in the Bovay soils assessment. Of the total 35,854 Km^2 in the department, almost one-third (11,224 Km^2) is in a forest reserve above Latitude 17^0 10'. Under current government policy, this area is not to be used for colonization. Of the remaining 2,263,000 hectares of land, a total of 686,750 cannot be distributed for agricultural use: 151,950 are in park and archaeological reserves, and 534,800 are forest reserves. Thus, the starting point for analyzing land available for agricultural use in El Peten is 1,776,200 hectares, most of which is in Karst and wetlands soil types.

The option selected for determining the amount of arable land makes a considerable difference for subsequent analysis of land availability. If one includes only first class, second class, and multiple use land then the potentially arable area is 2.95 million hectares (see Table 9 in Annex 1).

Since the area currently under cultivation in annuals, perennials, and pasture is 2.9 million hectares, it is evident that under this option there is only a minimal amount of arable land that is not already in use.

However, the inclusion of Karst forest land in Option 2 in the arable category increases the arable surface estimate to 4.8 million hectares. Karst lands deserve special discussion since about 50 percent of the north slope of the Central Highlands and the Franja Transversal are Karst, and 40 percent of El Peten has Karst soils (see discussion in Part I-D.3).

The Bovay study places emphasis on the potential use of land which is currently swamp or wetlands. If these are included, Option 3, the arable surface increases to 5.0 million hectares. This potentially arable land, however, requires considerable investment in water resource management before it can be productively used. Nevertheless, since there is a significant amount of this land both in the South Coast departments and El Peten, this option merits mention.

3. Karst Soils

Karst is "a limestone region marked by sinks and interspersed with abrupt ridges, irregular protuberant rocks, caverns and underground streams". Total Karst lands, in Guatemala are estimated at 23,759 Km^2, all of which are found in the departments of Huehuetenango, El Quiche, Alta Verapaz, Izabal and El Peten.

The Karst soils of Guatemala are acid. They also generally have a high water conduction rate, and a tendency to dry out quickly. Hence, erosion and nutrient loss resulting from the removal of forest cover are greater on Karst soils than on other types. Karst soils are characteristically thin; the soil layer may vary from just a few centimeters to half a meter in thickness over the underlying porous limestone. Erosion can rapidly produce a total elimination of soil from the substratum. There is less danger of this occurring on relatively level land than on steep slopes.

There is general agreement among soil scientists and agriculturalists who have examined the Guatemalan Karst region that the Karst soils should be carefully tested before attempting to use them for agriculture. The fact is, however, that a great deal of Karst land has been cut over and is used for crop production. No doubt this has resulted, and is resulting, in severe deterioration of the soil in some areas as well as in potential drainage and flooding problems.

There are, on the other hand, farms located on Karst which appear prosperous and have no major erosion problems. This is because they are under a dense cover of permanent crop, such as coffee, with shade trees, so that the soil is never exposed. This implies that if Karst lands are to be used for agriculture at all, the forest cover should be replaced as quickly as possible with something similar in the form of a permanent crop.

Since Karst lands are variable in topography, depth, drainage and other characteristics, decisions regarding their use should be made in the different

micro-environments in which they are found. For example, the rocky outcroppings, abrupt ridges, and sinks typical of Karst lands impede their use for annual crops; yet there are authorities who point out that these characteristics do not necessarily interfere with the use of Karst for some perennial crops, or pastures.

The Soils Department of the Ministry of Agriculture is studying the soils of El Peten and developing recommendations for the rational management of the Karst lands. If one can assume that roughly 10,000 Km^2 of the 23,759 Km^2 of Karst lands in Guatemala can be rationally used in agriculture, land for the settlement of a considerable number of additional farmers could be made available.

4. Summary of Three Options of Land Availability

The amount of unused public domain land potentially available in the country is 106,667 hectares of FCE units, as estimated in Option 1 without including either Karst forest land or swamplands as potentially arable; or 472,642 hectares of FCE units as estimated including Karst forest land as in (Option 2); or 571,342 hectares of FCE units as estimated including Karst forest land and swampland (Option 3)(see Table 10 in Annex 1). Only the departments of El Peten and Izabal in the North and Retalhuleu in the South have public domain land available in Option 1. El Quiche, Alta Verapaz, and Huehuetenango are added to this group in Options 2 and 3.

This confirms the commonly held perception upon which most recent land distribution has been based: the Franja Transversal del Norte (FTN) and El Peten are the principal areas of the country in which public domain land is still available for distribution. This is the type of land that has been distributed through the land colonization programs of the last 20 years.

Considerable amounts of land are available under the idle land provision of the agrarian transformation law. The estimates range from 262,800 FCE units of land to 198,978, depending on which option is used to determine potential land use (see Table 10 in Annex 1).

The National Agrarian Transformation Institute of Guatemala has available in the country either 369,467 First Class Equivalent (FCE) units, 671,621 FCE units, or 773,089 FCE units of land to distribute in colonization or expropriation/sales programs, depending upon the option chosen and the concommitant investment made.

E. The Man-Land Equation

As noted earlier, the current population eligible for land distribution is all Guatemalan males over 18 years of age who do not own land and who are not involved in commercial activity. The method used to determine the total number of potential recipients of land at the national level (see Section C, above) was applied at the departmental level. Since the legislation does not set standards for size of plot, we proceed with the assumption that adult males over twenty years of age, as potential heads of household, will require a parcel large enough to support a nuclear family.

We used the following method to set a norm for the minimum family-size holding in Guatemala. The Inter-American Committee on Agricultural Development (CIDA) adopted a standard of seven hectares as the minimum size for a family farm. This standard does not adjust for land of varying quality and type. Seven hectares of first class land is more than required to support a family, and exceeds the labor capacity of a nuclear family. Seven hectares of Karst land would not be sufficient for a family. Consequently, we established a standard norm at the national level which is comparable to the measures of land available. This was done by analyzing the relation between land in use and arable land. We calculated the ratio of First Class Equivalent land to land in use, excluding the department of El Peten because of its current underutilization. The result is a ratio of .5628, the relation between 1,480,400 hectares of First Class Equivalent land to the 2,630,500 of land used for crops and pasture. Consequently, 7 hectares of average farm area are equivalent to 3.9 hectares of First Class Equivalent land. This standard norm corresponds very closely to estimates by agricultural economists familiar with Guatemalan agriculture, who estimate that a farm of 3.5 hectares of unirrigated land is the maximum that can be cultivated with family labor supply.

We calculated the number of families that can be settled on potentially available land by dividing the number of hectares available for cultivation in each department by 3.9. Two separate sets of calculations were then carried out under each of the three options of land availability. The first set of

calculations includes only those agricultural laborers who are not permanently employed on plantations, a total of 309,119 workers (Tables 11 A, B, and C in Annex 1). The second set of calculations includes these permanent workers, for a national total of 419,620 (Tables 11 D, E, and F in Annex 1).

A net deficit of land is found under all three options of arable land potentially available, regardless of the definition of the potential recipient population. Under Option 1, only 31 percent of the non-permanent landless laborers can receive a family-size plot of land if both idle farm and public domain land are distributed (Table 11 A). Only 23 percent of all landless laborers, with permanent farm laborers included, can receive land under this option (Table 11 D).

The situation is somewhat less bleak if Karst land is considered arable: 55 percent (Table 11 B) and 41 percent (Table 11 E) of the landless could receive land under existing legislation and land distribution conditions for the landless, excluding and including permanent farm workers, respectively.

If we assume that sufficient public investment will be available to develop the infrastructure required to drain and manage swamp and wetlands, then sufficient land is available to distribute land to 64 percent of the landless (Table 11 C) under the narrower definition and 48 percent of the landless population (Table 11 F) under the broader definition.

To summarize: Guatemala does not have sufficient land to provide family-size parcels to all the landless rural agricultural population in 1980. Contrary to the popular illusion, there is not unlimited land available

in the FTN and the El Peten. Any quantification of land available based on soil conditions and the current size of the population shows that in the worst case, Guatemala can accomodate only 31 percent of its landless; while in the best case it can provide sufficient land to only 64 percent.

F. TRENDS IN PERMANENT MIGRATION

In the face of the patterns of land scarcity described above, migration trends become integral to understanding the economic behavior of the landless and the landpoor. Indeed, annual migration represents an extremely important aspect of the labor market and can be an economic survival strategy of the landless and landpoor, particularly Highland Indians (Schmid, 1973; Zarate, 1967; CIDA, 1965). Estimates of migratory workers range from 220,000 to 500,000. However, a comprehensive analysis of annual migration in Guatemala in all its complexity and facets is beyond the scope of this study. This section deals only with permanent relocation with emphasis on the rural population of Guatemala. It should be noted here that in the area of migration the data and background studies were neither as numerous nor as in-depth as in other subject matter areas. Therefore, we are making maximum use of limited census data and a few pertinent general studies.

Permanent migration in Guatemala does not differ significantly from other countries in Latin America if the population is taken as a whole--i.e., there has been a continuing process of urbanization. However, if the population is divided into Indian and Ladino populations (see Tables 12 and 13 in Annex 1), differing patterns of migration emerge (CSUCA, 1978; CICRED, 1974; McGrevey, 1978). The Indian population is predominantly rural and poor. The Ladino

population includes a large group of people more highly educated, urbanized, and skilled in trades, as well as the rural poor. In the Western Highlands, the Ladino population is highly concentrated in urban areas, with the Indian population largely rural. Thus, the rural poor Ladinos and Indians, though differing in area of origin, tend to converge in areas of destination which are economically attractive.

As can quickly be seen in Table 12 in Annex 1, Ladinos tend to migrate in greater numbers than do Indians, though this difference is exaggerated by the ability to and the practice of, change of ethnic identity from Indian to Ladino by some migrants. It should be noted that the data do not support the myth that Indians do not migrate permanently or, if they do, that they automatically lose their cultural identity.

The area of greatest egress for Ladinos has been the Oriente, the departments of Zacapa, Chiquimula, Jalapa, Jutiapa, Santa Rosa, and El Progreso. The Altiplano departments of Totonicapan, Chimaltenango, San Marcos, Huehuetenango, El Quiche, the Verapaces, and Chiquimula have lost the greatest Indian population. Most of the migration for these two groups from these departments has been poor and rural. The exception to this is Totonicapan, where the majority of out-migrants have been urban Indians.

Migration to urban areas by rural poor is not uncommon; however, this is usually the final move in a series, called step migration. A typical step migration pattern for poor rural Guatemalans begins with a move to an area of high agricultural labor demand, especially Izabal, the South Coast departments

of Suchitepequez, Retalhuleu, and Escuintla or the coastal portions of Santa Rosa, San Marcos, and Quetzaltenango. Push factors, particularly high population density, poor land or lack of land, and lack of off-farm employment, and pull factors, especially opportunities of permanent employment or sufficient day labor, precipitate initial migrations.

Though push factors affect successive moves, pull factors appear to be more significant, particularly availabililty of land and permanent employment, either in agriculture or in urban wage labor. It is not uncommon for migrants to make one or more intermediate relocations prior to a final settlement. Frequently these moves are among the departments of the South Coast. Final residence varies greatly with some people eventually returning to their native areas and others moving to urban areas, such as Guatemala City, Quetzaltenango or Escuintla. Those who finally settle permanently in rural areas and continue to be economically active in agriculture tend to become resident laborers or permanent workers on coastal plantations or to purchase parcels of land in Izabal or El Peten.

Another major aspect of permanent migration involves equilibrating patterns of migration between contiguous departments. These can be part of step migration, but more frequently rural poor seek nearby areas of lower population density where small parcels are available. Obviously, a lot of this type of migration also takes place within departments, but this is not captured well by the census data.

Table 13 in Annex 1 deals solely with the period 1968 to 1973 and shows change of permanent residence within that period. It is interesting to note that the magnitudes of migration by percentage show that some departments

reflect very distinct patterns as between their Indian and Ladino populations. Some of these differences result from the socio-economic advantages which accrue to segments of the Ladino population. The data also suggest that in Escuintla, Santa Rosa and perhaps Suchitepequez, Indians are supplanting parts of the Ladino agricultural labor force.

The departments of high egress rates have, with few exceptions, extremely low availability of arable land per capita. (Compare Table 3 and Table 13 in Annex 1).

TABLE 3. ARABLE LAND PER CAPITA
OPTION 1
(IN HECTARES*)

Department	Year 1950	1964	1973	1980
All Guatemala	1.71	1.11	.92	.79
Chimaltenango	.42	.32	.26	.22
El Progreso	.28	.21	.19	.17
Guatemala	.07	.04	.03	.02
Sacatepequez	.05	.04	.03	.02
Escuintla	3.07	1.41	1.38	1.14
Santa Rosa	.88	.62	.54	.48
Huehuetenango	.69	.48	.38	.32
Quetzaltenango	.33	.23	.20	.17
Retalhuleo	2.30	1.31	1.24	1.03
San Marcos	.33	.23	.20	.16
Solola	.09	.07	.06	.05
Suchitepequez	1.74	1.16	1.07	.91
Totonicapan	.20	.14	.12	.10
Alta Verapaz	1.19	.86	.80	.70
Baja Verapaz	.33	.23	.21	.19
Izabal	6.35	3.00	2.06	1.80
El Peten	154.03	92.09	36.50	18.66
El Quiche	1.04	.73	.60	.56
Chiquimula	.63	.47	.44	.42
Jalapa	.50	.38	.31	.28
Jutiapa	1.04	.74	.62	.58
Zacapa	.51	.37	.34	.31

*Calculated from TABLES 5 and 9 of this Study. See Annex 1.

Guatemala and Quetzaltenango have urban concentrations which exaggerate the population pressure there. Solola and Sacatepequez both have very intensive agricultural production, particularly of vegetables, which is made possible by serendipitous soil and climatic conditions, though both departments are widely over-cultivated, as well. Given the magnitude of this push factor, it is difficult to understand why permanent migration has not been greater. If we look at the opposite side of the equation, the pull factors, we can readily see the barriers to migration.

Most areas of high attraction, Escuintla, Suchitepequez, and Retalhuleu, have relatively low population to arable land ratios. This would, in a truly open economy, tend to attract land seekers to equilibrate population pressure on land. However, looking at Table 1 above, one can quickly see these departments show markedly skewed distribution of their arable land in agriculture. This indicates a lack of opportunity for landpoor and landless people who wish to be owners of adequate size land holdings. Areas where this type of opportunity exist, El Peten and Izabal (see Tables 1 and 3) are remote, lack infrastructure and are difficult for Highland peasants to obtain information about. However, Izabal and El Peten are still major attraction areas with significant in-migration.

It appears clear that Guatemala's rural population, both Ladino and Indian, does respond to economic opportunity, where and when it exists, even though the opportunity may be only marginally better than their prior circumstances.

However, the lack of outlets for push factors in Indian migration is one variable explaining the present unrest in the Highlands. The combination of high and increasing population densities, severe and increasing minifundization of landholdings, and the structural poverty of the Highland population intensifies socio-economic pressures, and leaves the victims open to radical and violent politicization.

ENDNOTES

[1] There is the recurrent problem, for example, of under-reporting, particularly among large landowners. One manifestation of this is the figures reported by the 1979 Agricultural Census in the four departments of the Franja Transversal del Norte (FTN)--Huehuetenango, El Quiche, Alta Verapaz and Izabal--on the number of farms larger than 450 hectares. The Census data identify 309 farms in this category (for the total area of the four departments). However, the more accurate cadastral work plan for the USAID-supported GOG Pilot Colonization Project in the FTN identifies 266 farms over 450 hectares in the FTN alone, which represents only about 25 percent of the territory of the four departments. See Table 22 in Annex 1.

[2] An examination of Table 2A reveals that the land in farms in 1964 was actually less than in 1950. This anomaly should not be understood to mean that the actual amount of land in farms decreased. Rather, the generally accepted interpretation concerns inaccuracies in the census material. Widely differing opinions are expressed as to which census, 1950 or 1964 is the more accurate. Those who argue for the 1950 census state that it was conducted prior to the widespread land reform of the 1953-1954 period and before the land reform in Cuba and subsequent creation of the Alliance for Progress, which contained, as one of its self-help indicators for United States foreign assistance the establishment of land reform programs. These events all served to heighten

concern in Guatemala among the large landholders, and are seen as giving them grounds for underreporting the amount of land they owned. In addition, it is likely that some large farms have been divided up into separate units, each owned by different members of the same family in some cases in order to avoid drawing attention to the actual extension of the farm. Indeed, an examination of the 1964 census in contrast to the 1950 shows a dramatic drop in the number and size of farms in the largest category (i.e., 9,000 hectares and larger). Hence, in 1950 there were 22 farms in this category occupying 499,848 hectares, while in 1964 there were only 9 farms occupying 160,927 hectares. Similar less dramatic drops occurred in the other categories of large farms (450 hectares through 9,000 hectares). As will be shown in Part Two, the large farms expropriated in the 1953-1954 period were almost all restored to their original owners and no expropriation of large farms has occurred since that date. It is likely that the decline in the largest categories included considerable underreporting. However, others argue that the 1964 census was a more professional effort and represents a more realistic assessment of land tenancy in Guatemala. On balance and after considering the arguments, the team concluded that the 1950 census, although less technically perfect than the 1964, presents a more accurate picture.

[3]The colono system in Guatemala is one in which the owners of land, usually large estates, cede small parcels of land to their permanent workers, known as colonos . The colonos have the right to work those lands so long as they remain permanently employed on the plantation. Ownership rights are rarely acquired.

PART TWO. GOVERNMENTAL RESPONSE TO AGRARIAN PRESSURE*

A. The Etiology of the Agrarian Dilemma

Among the major structural changes introduced by the Spanish during the colonization of Guatemala, perhaps none is of greater significance than the large scale privatization of land. While there is evidence that private land ownership existed along side of the predominant pattern of communal ownership, the Spanish viewed the latter as an inferior and indeed primitive ownership form. The conquerors, supported by a royal decree issued in 1513, immediately set about replacing the "primitive" with the "modern". This was accomplished by dividing up much of Guatemala's land and labor through the application of the dual systems of repartamiento and encomienda. The net result was that the conquistadores gained control of vast quantities of land with large numbers of Indians working under feudal conditions, though within a system of reciprocal obligations and duties.

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* This narrative draws on CIDA (1965) Aballi Mota (1976), Paredes Moreira (1961, 1963, 1964), CSUCA (1978), Menjivar (1969), Villacorta Escobar (1973), Gayosa (1970) and Fuentes-Mohr (1955).

Independence from Spain in 1821 produced neither substantial de facto nor de jure alterations in the structure of tenancy erected in the colonial period. Indeed, the government of the new republic seemed committed to exacerbating the inequalities which existed between Indians and Spanish settlers. As early as 1825, Guatemala passed its first agrarian law, the primary purpose of which was to help increase the volume of public domain land transferred to private hands, in the belief that "the small number of landowners is one of the causes of (Guatemalan) underdevelopment." Acquisition of public domain land was accomplished through purchase from the state and hence also served as a source of revenue for the fledgling republic. The absence of capital among the indigenous population virtually excluded them from acquiring such lands.

In a further effort to stimulate development, Guatemala passed a series of laws designed to encourage European migration through the establishment of agrarian colonies. An 1835 project failed, leading to a more carefully planned scheme, approved in 1842, designed to attract primarily Swiss and Belgian farm workers to settle in what is today Puerto Matias de Galvez. That effort also ended in failure . New programs were approved in 1877 (to attract Austrians) and 1885 but also proved unsuccessful. These 19th century colonization schemes were not designed to improve the internal distribution of wealth or benefit the Indian population. Indeed, Guatemalan "backwardness," as it was referred to at that time, was viewed largely as a consequence of the predominance of tradition-bound Indians in the population. Colonization promised to infuse the local population with enterprising, hardworking Europeans who would help stimulate capitalist development.

While these efforts to stimulate foreign colonization inched slowly forward, a dramatic shift occurred in Guatemalan agriculture. In the early 1840's, coffee cultivation was introduced for the first time and proved to be a highly successful crop. The rainfall and temperature conditions in Guatemala produced a grade of coffee which commanded a high price in the selective markets of Europe. The promise of unprecedented profits encouraged the immigration of several German families who quickly became major producers. Hence, even though the earlier colonization schemes had failed, they did bring to the attention of some European families the opportunties to earn large profits. The existence of a large mass of Highland Indians who could be employed to pick the ripe cherries offered the solution to the labor supply problem. In order to provide a year-round supply of workers the colono system was developed. All that was needed was for the state to facilitate the transfer of inexpensive lands for those who wished to grow Guatemala's "brown gold."

The first major governmental effort to encourage agrarian development in response to the new opportunities created by the coffee trade occurred in 1871 with establishment of the "liberal reforms" of General Justo Rufino Barrios. The stated central objective of these reforms was to create a class of yeoman farmers in Guatemala. To this end a presidential decree of 1873 provided for the sale of from 45 to 225 hectare lots of public domain in the South Coastal region. These reforms also were directed against the

Catholic church in Guatemala, stripping it of much of its large landholdings. Unfortunately, rather than stimulate the development of a yeomanry, further land concentration was the net result. Through this decree, and the agrarian law of 1894 which superseded it, large portions of Guatemala were absorbed in private hands. Between 1896 and 1921 approximately 3,600 persons acquired an average of 450 hectares under the terms of the liberal reforms. As a result, approximately 1.6 million hectares of land, or nearly 15 percent of the entire national territory, was privatized in large holdings.

For the Highland Indian these reforms proved to be doubly pernicious. First, much of the best land in the Highland departments was absorbed into expanding coffee haciendas. Since coffee grows best in valley land of between 800 and 1500 meters altitude, Indians who had been farming those lands for generations were forced to move to higher, less fertile lands in order to continue to grow their subsistence crops. Second, many Highland estates also served the function of providing a labor reserve for coastal plantations operated by the Highland estate owners. It was common to find Highland estates planted with crops such as coffee which had labor requirements complementary with labor requirements in the coastal region. Indians would find steady employment in the Highland estates but be required to work a set number of days in the owner's coastal plantation. The end result was serious dislocation of the Indian family.

A further stimulus to both export-oriented agriculture and resultant land concentration emerged at the turn of the century. In 1901, after having established successful banana plantations in Costa Rica in the 1880's, the United Fruit Company began operations in Guatemala. It did so initially by providing ship mail service, using its fleet of banana boats. In 1904 the Company was asked to complete the cross-Guatemalan railroad which had been under construction for several years. In 1924 the Government of Guatemala ceded large land areas to the company. Then again in 1930, in the fertile Pacific lowlands, other large concessions of land were granted. These concessions ultimately summed to 188,339 hectares. It was these lands that were later to become a prime target of the land reform of the early 1950's.

Despite the vast quantities of land passing into private hands under the "Liberal" reforms, the largely rural Guatemalan masses remained poor while the growing Indian population confronted a steadily declining land resource base. This problem was exacerbated by the rapid erosion of small plots which the Indians were compelled to work more intensively. Nonetheless, colonization schemes continued to predominate the thinking of those who sought to develop Guatemala. In 1928, a Department of Agrarian Colonization was created as a branch of the Ministry of Agriculture. It was charged with responsibility for encouraging the repatriation of Guatemalans who had moved to other countries by attracting them with the offer of free land and free title. In 1929 colonization programs were opened in the departments of El Peten, San Marcos, Huehuetenango, El Quiche, Jutiapa, Chiquimula, Jalapa and Alta Verapaz.

Guatemala's persistent Highland Indian poverty became the object of a reform initiated by General Jorge Ubico. In 1931, Ubico decreed that the ejidal (common) land of the Highland communities was to be divided up among the indigenous population and an administrative board was to be established for the development of these lands. The government was to have provided technical assistance and management guidance to the Indians. Also in 1931, plots of up to seven hectares were made available for landless workers who were permitted usufruct rights on these lands. But in 1934, a law was introduced to help assure the availability of Indian labor. Under this "vagrancy law", smallholders were forced to work between 100 and 150 days a year and carry an official passbook in which the employer would certify to the number of days worked. Perhaps the most important changes introduced by Ubico were passed into law in 1936. In that year, prior agrarian legislation was revised and combined into a single law which essentially maintained the spirit of the earlier legislation. But the accompanying Ley de Impuesto sobre Eriales y Latifundios of 1936 appeared truly revolutionary in the context of Guatemala agrarian law. It established that idle land in farms larger than 500 hectares would be subject to a tax of from two to four percent of the value declared for tax purposes. Moreover, it stated that farms over 4,500 hectares were to be considered "an obstacle to agrarian development...." Unfortunately, the law was largely ignored while Ubico contradicted his own statements and distributed large tracts of land to his favored military commanders.

B. Agrarian Reform, 1944-54

The overthrow of Ubico in 1944 began a process which was to culminate in 1952 with the passage of Guatemala's first major agrarian reform law. The constitutional base for that law was laid in 1945 by the newly elected president, Juan Jose Arevalo. That constitution, (Titulo IV), declared that it was the state's responsibility to develop agricultural activities and that the benefits therefore were to go to the producers. Article 90 contained the important provision, adopted from the Mexican constitution of 1917, that private property was to be recognized and guaranteed only in so far as it fulfilled its social function. The constitution went on to provide for expropriation when in the public interest. Finally, the new constitution abolished indentured servitude on plantations, and allowed for the organization and unionization of peasants.

Following the ratification of the new constitution, a series of laws and presidential decrees were promulgated which detailed and amplified the agrarian provisions in the constitution. In 1945, the Law of Suppletory Titling (Ley de Titulacion Supletoria) was enacted providing a mechanism by which land worked for at least 10 years could be titled to those who had worked it. The purpose of this law was to provide title security to smallholders. Unfortunately, it was frequently used as a mechanism for the already wealthy to acquire even larger landholdings. In 1947 the Labor Code

(Codigo de Trabajo) was approved, specifying, among other provisions, procedures to be followed for the establishment of unions and for the declaration of legal strikes. However, the Code prohibited unionization on farms with fewer than 300 workers and hence restricted the right to unionize to only the largest plantations.

The first law to focus directly on the land tenancy problem was enacted in 1949. Called the Law of Forced Tenancy (Ley de Arrendamiento Forzoso) it decreed that all farm land currently being rented on both state and private land would continue to be rented for an additional two years to those who had rented it during the four years prior to the enactment of the new law. Furthermore, landowners were compelled to rent idle land and to charge no more than five percent of the value of the crop thereby obtained.

As far as can be determined, these various provisions had little impact on traditional agrarian structures in rural Guatemala. This was to change dramatically, however, with the election of Jacobo Arbenz in 1951. Arbenz declared that he would convert Guatemala into a "modern capitalist nation" through the dual process of industrialization and agrarian reform. The latter was to be accomplished through the application of the Law of Agrarian Reform, also known as Decree 900, approved by the Guatemalan Congress on June 17, 1952. The law declared that its objectives were: (1) elimination of feudal estates in the countryside, (2) elimination of indentured servitude, a remnant of the colonial encomienda system, (3) provision of land to the landless and to landpoor laborers, and (4) provision of credit and technical assistance to smallholders.

Land reform under Decree 900 was to be carried out through the expropriation of idle land and land which owners had granted to others as rented or sharecropped land. However, no farm less than 90 hectares, cultivated or not, was to be affected by the expropriation provisions. Moreover, farms larger than 90 hectares would not have subjected to expropriation that portion of the farm beyond the 90 hectares which was not idle or rented/sharecropped. In addition, farms between 90 and 270 hectares which were at least two-thirds cultivated, were exempt from expropriation. Finally, farms on which cash crops (for export or domestic use) were grown were exempt from expropriation even if the land was rented to others. Specifically included under this provision were farms which produced coffee, cotton, citronella, lemon tea, bananas, sugar cane, tobacco, rubber, quinine, fruit, hay, beans, cereals, and other commercial crops. In effect, these exceptions and/or exclusions made Decree 900 a reasonably moderate land reform, at least on its face, as it was characterized repeatedly by the Arbenz government.

The beneficiaries of the reform were specified as (1) smallholders, (2) plantation laborers (mozos and colonos) and (3) landless agricultural laborers. In addition, blue collar urban workers who were entitled to receive payments under the Labor Code could opt to receive land instead of cash.

The amount and form of tenancy of land to be distributed to each beneficiary also was specified in the law. In El Peten, a maximum of 1,350 hectares could be claimed, but held only for the lifetime of the beneficiary (usufructo vitalicio). In other parts of the country, land would be redistributed as follows: for cultivated land, a minimum of 3.5 hectares and a maximum of seven hectares; for uncultivated land, between 10.5 and 17.5 hectares; and for smallholders with less than seven hectares, their holdings could be expanded up to a maximum of 17.5 hectares. In addition, if sufficient land was deemed to be available, non-peasants with sufficient capital could rent up to a maximum of 280 hectares from the state for periods of between five and 25 years.

All land received by beneficiaries was to be paid for. Those who became owners of land expropriated from private owners were to pay by turning over to the government five percent of the value of the crops harvested each year. Beneficiaries on state land (principally the State Farms expropriated from German interests during World War II), would receive their land with lifetime usufruct rights and would pay a rental fee of three percent of the value of the annual production to the state. Non-peasants who rented land under the provision stipulated above, were to be charged five percent of the annual value of the crop.

The lands distributed to beneficiaries could not be sold or otherwise alienated for 25 years, although they could be rented. Lands distributed in the form of lifetime usufruct rights could not be transferred, but could be rented with the prior approval of the government. Indemnization for the expropriated land was to be based upon the value declared for tax purposes as of May 1952. The land was to be paid for in 25-year agrarian bonds, guaranteed by the government, yielding an annual rate of three percent. For that purpose 10 million Quetzales (U.S.$ 10 million) in agrarian bonds were issued.

Decree 900 was administered by a new institution created for that purpose, the National Agrarian Department (Departamento Agrario Nacional), whose director reported to the President of the Republic. Decisions taken by Guatemala's President were deemed to be definitive, with no judicial appeals permitted. A National Agrarian Council (Consejo Nacional Agrario) also was established and charged with the responsibility of reviewing the expropiation activities of the National Agrarian Department. Information about which lands were subject to expropriation was to be generated at the local level by Local Agrarian Committees (Comites Agrarios Locales), each of which was to be composed of five members: one named by the Governor of the Department, one named by the local municipality, and three by the local peasant organization or plantation union.

Support for the beneficiaries was to come from two sources. Credit was to be administered by a newly created National Agrarian Bank (El Banco Nacional Agrario), opened in July 1953 with Q10.52 million (U.S. $10.52 million) of capital, with deficits incurred during its first five years of operation to be borne by the state. The government also was to provide technical assistance; extension services, seeds, etc.

Expropriation under Decree 900 began on January 5, 1953, and continued through June 16, 1954. During that period 1,002 decrees of expropriation were issued affecting 603,615 hectares of land (see Table 14 and related notes in Annex 1). Added to this was an approximately 280,000 additional hectares of State Farms, for a total of 883,615 hectares.

Compensation to be paid totaled Q8,345,544, of which Q7,870,775 was issued in bonds up through June 16, 1954. The price paid per hectare of land varied from a low of Q1.89 to a high of Q28.53, with the national average of value declared for tax purposes in May 1952 being Q6.29 per hectare.

Estimates of the number of beneficiaries of the reform vary. One source cites 78,038, another 88,000, while another refers to 100,000. Of these, somewhere between 23,000 to 30,000 were beneficiaries of the distribution of National Farms. It is difficult to determine what proportion of the landless

population benefited from the Decree 900 reform because of the absence of reliable estimates of the number of landless peasants at that time. CIDA(1965:59) estimates 68,700 landless laborers in 1950. We feel that this is an understatement of the magnitude of this group because it does not consider the colonos as landless laborers when in fact they were the principal beneficiaries of the land reform. We have used the agricultural and population census material to produce what we consider to be a more reliable estimate of 248,000 landless laborers in 1950. Using that estimate, between 31 and 40 percent of the landless labor force benefited from the reform[1]. The National Agrarian Bank provided nearly 36,000 loans for a total of 8.4 million Quetzales. In addition, the National Mortgage Bank (Banco de Credito Hipotecario Nacional) made 17,843 loans to beneficiaries for a total of Q3.4 million.

Several problems plagued the reform and reduced its effectiveness. First, while the reform sought to eliminate indirect forms of landownership (renting and sharecropping) it provided a series of mechanisms, discussed above, under which land was to be rented from the state. Indeed, the predominant form of land distribution under the reform was that of lifetime usufruct (72.5 percent of the land) upon which rentals would have to be paid. As a result, some of the problems which were a by-product of the pre-reform system were maintained in a modified form under the new system. One could argue that a new dependency was created between the cultivator and the government, substituting one "patron" for another. Indeed, most beneficiaries became state tenants -- albeit with lifetime property rights -- not private farm property owners.

Second, since land loaned by plantation owners to their workers (colonos) prior to the issuance of Decree 900 was subject to expropriation, and since in many cases those plots were scattered throughout the plantation, a crazy-quilt pattern emerged out of the reform of these lands. Moreover, those plantation owners who had been more generous with their workers and given them larger plots on better soils lost more under the reform than less generous plantation owners, thereby creating a substantial inequity.

Third, the local committees lacked participation of the landowners, an omission which led to numerous abuses of power. Since there was no appeal of presidential decisions made under Decree 900, there was little chance for these abuses to be corrected. In one case where a landowner successfully appealed to the Supreme Court for a reconsideration of his case, President Arbenz dismissed four of the judges and packed the bench with judges favorable to his position.

The abuses referred to above were magnified by another provision of Decree 900 which stipulated the total expropriation without indemnization of land owned by those who opposed the reform by violent or subversive means.

In many cases the price paid for the expropriated land was unrealistically low. While it seemed just that the value declared for tax purposes was a fair price to pay for the land, the nature of the tax system was such that virtually all property holders in Guatemala, smallholder and latifundista

alike, undervalued their land for tax purposes. Low taxes on agricultural property have long been seen in Latin America (perhaps incorrectly) as a mechanism to stimulate agricultural development by increasing the profitability of the enterprise. The magnitude of the problem was compounded by the fact that the Government of Guatemala had not readjusted the declared assessment value since 1931.

The rapidity of the reform also led to abuses. Once the process of expropriation began it was hard to control. In the first months of the reform, from January to March 1953, between 22 and 25 expropriation orders were issued per month. That number increased substantially so that in March 1954, a total of 98 expropriations were decreed. Indeed, of the 443 expropriations decreed from December 17, 1953 through June 16, 1954, not one was published in the official government newspaper.

In effect, the Arbenz land reform program could be characterized as -- on balance -- a moderate, progressive reform though flawed in a number of respects. Its basic thrust was to redistribute idle lands held in large private estates and Government-owned State Farms. In principle, Decree 900 respected private farm lands in production. However, it also seems clear that in practice, the program suffered from a progressive political radicalization and a volatile proliferation of land disputes between different types of beneficiaries.

The reform came to an abrupt end when on June 27, 1954, President Arbenz was deposed by Colonel Castillo Armas.

C. Agrarian Titling, 1955-1982

1. Narrative Description of Agrarian Transformation

a. Agrarian Development Zones, 1955-62

In the six months following the fall of the Arbenz government, the majority of land expropriations were annulled. The National Farms were taken away from the workers who had received them under Arbenz and returned to government management and control. The land reform law (Decree 900) was abolished by Decree 31, and a subsequent decree established a legal mechanism for owners of expropriated land to regain title to their farms.

In early 1956, Decree Law 559 was passed to regulate agrarian reform activity, establishing the Department of Colonization and Agricultural Development as part of the Ministry of Agriculture. This law introduced a progressive tax on idle land and a mechanism by which land that remained idle for five years could be expropriated. Agrarian Development Zones were established as areas in which land distribution would be concentrated.

Rather than distributing titles for large farms to cooperative groups of workers, fee simple titles for family-size parcels were awarded to reform beneficiaries. By 1960, a total of 3,800 parcels averaging 20 hectares each

were distributed in 21 Agrarian Development Zones. These zones were concentrated in the South Coast (Departments of Escuintla and Retalhuleu), the Pacific Piedmont (Suchitepequez and Jutiapa), and the Northeast (Izabal). American foreign aid, through ICA, provided $6.5 million for a supervised credit program in these zones, and the Guatemalan government provided $4 million from its own resources.

A review of Guatemalan agrarian history by Herrera characterizes the principal obstacles to effective agrarian reform which led to a slowdown in agrarian transformation after 1954. These include inadequate public financing, lack of organizational knowledge in rural areas, and continuous changes of legislation and regulations. But the most serious obstacle was "systematic opposition of the capitalists who see land tenure reform as a taboo to their private interests" (Herrera, F. 1966:25).

During this period, the Department of Colonization and Agricultural Development was responsible not only for distribution of land but for the provision of services to the beneficiaries of reform. Road building, housing development, potable water systems, and school construction were all programs for which the land reform agency had primary responsibility.

Progressive taxation of idle land was to be regulated by the agrarian reform agency, though actual tax collection remained the responsibility of the Ministry of Finance. Between 1958 and 1965, 233 farms were assessed a tax of Q.117,269.19. This tax affected an idle surface area of 99,077 hectares. There is no indication that any farms were expropiated under this provision of the law.

The reform carried out was largely ineffective because of its minimal impact on land distribution patterns, and because its focus on granting small parcels resulted in a perpetuation of subsistence agriculture among beneficiaries. However, these individual beneficiaries were relatively better off than Highland subsistence farmers. Yields of corn in the Agrarian Development Zones were three times higher than in the Highlands as a result of double cropping, the higher fertility of land, and the provision of inputs and technical assistance.

The statistics of the period speak for themselves. An estimated 550,000 hectares of land distributed under Arbenz were returned to their former proprietors and 265,197 hectares were distributed to small farmers. Thus, twice as much land was taken out of the reform process as was subsequently distributed.

The governmental regimes of the period seem to have been vying to outdo each other in the rollback of the Decree 900 reform, particularly with regard to the selling of the National Farms, which had been property of the state since the mid-1940's. Of the 74 National Farms, 11 were distributed as large landholdings to private individuals under Castillo Armas (1954-1958) and 28 were distributed under Ydigoras Fuentes (1958-1962). In this fashion, an estimated total of 122,000 hectares of national lands were distributed to 39 farmers at an average farm size of 3,128 hectares each. This land contained prime acreage in permanent crops such as coffee, cardamom, and sugar cane.

In essence, land distribution followed two very different patterns during the period. The principal beneficiaries of redistribution were large landowners, each receiving large tracts of prime agricultural land (either from National Farms or returned expropriated farms) producing cash crops. The secondary beneficiaries were the landless poor, receiving small parcels of land producing primarily corn and other subsistence crops.

The period can best be characterized by the following quotation from the 1970 AID/PPC Spring Review of land reform in Guatemala:

> "The impact of colonization on the land tenure structure has been negligible, if any (sic). A number equivalent to less than ten percent of the 308,000 minifundia farm operators in 1950 have been settled. The land tenure structure in 1964 remained highly skewed with 2.9 percent of the farms controlling 62.6 percent of farm land while 87.5 percent of farms - all below 17 acres- covered 21.5 percent of the farm land. The number of these minifundia operators increased by 18 percent. Plantations remain the mainstay of Guatemala's agriculture and still control most of the country's foreign trade. Levels of productivity have remained low - bananas and cotton excepted - helped by continuous reliance on a large supply of cheap labor originating in the colono system and in the subsistence sector. The character of rural life in Guatemala has changed remarkably little since 1950. If the 1952-54 episode were to be erased out of the history books, it would not be missed since history would appear to continue without interruption." (Spring Review, 1970:6.)

b. Land Colonization, 1963-1981

A new agrarian reform law, Decree 1551, was passed in October 1962 in preparation for the Punta del Este conference. The law, drafted by a Spanish lawyer contracted by the Guatemalan government, consists of a restatement of the major provisions of Decree 559 along with some new elements borrowed from Spanish agrarian law. This law, as modified, in Decree 27-80 in 1980, has provided the legal framework for agrarian transformation activities up to the present.

During this current period, as in the previous one, colonization in Agrarian Development Zones has continued as a package program including distribution of land, credit, and technical services. Decree 1551 has been viewed by some as a more effective agrarian reform instrument; this is contradicted by the facts.

For example, the pace of distribution between 1963 and 1970 was even slower than in the preceding eight years. Approximately 69,000 hectares were distributed between 1963-70, but the bulk of this distribution was National Farm lands -- about 46,210 hectares. This is the same land that had already been given and subsequently taken back.

Also during the current period, the focus of agrarian transformation has turned to development of the Northern and Northeastern areas of the country. The policy of the Mendez Montenegro government which took power in July 1966 was to make the development of the departments of Izabal, El Peten, Huehuetenango, Alta Verapaz, Baja Verapaz, and El Quiche a matter of national priority.

This policy did not translate into effective programs for various reasons, principally because land colonization in virgin territory is expensive. Land distributed in Agrarian Development Zones in areas with varying degrees of infrastructure development was relatively inexpensive to the Government. However, the expense of extensive new lands colonization, in areas with virtually no infrastructure, was greater than what can be financed by the resources of the Guatemalan public sector.

The 1970 Spring Review by AID/PPC poses the dilemma for Guatemalan agrarian transformation at the time, should expensive colonization be preferred to relatively inexpensive distribution of idle lands in the private sector. The review estimates that 1.77 million hectares (4.5 million acres) of idle lands in the private sector were already accessible and with some infrastructure.

The choice made by the Guatemalan government and supported with external financing from the USAID Mission was to carry out colonization. Between 1971 and 1981, approximately 330,000 hectares of land were distributed. Almost ninety percent of this land (292,000 hectares) is located in frontier colonization areas.

2. Analysis of Land Distribution Statistics, 1955-1982

For an explanation of the methodology used to compute statistics on land distribution for this period, see Annex 3.

a. Rate of Land Distribution during the Period

The actual number of hectares distributed between 1955 and 1982 is 664,525 hectares. A total of 50,267 beneficiary families are currently settled on this land. These total figures provide an instructive contrast to the 1953-1954 reform period in which approximately 78,000 families received 602,000 hectares. The annual rate of distribution for the 1953-1954 period is 401,378 hectares. The comparable rate for the 1955-1982 period is 24,612 hectares per year. In other words, the pre-1955 agrarian reform distributed land at an annual rate 16 times greater than the post-1955 reform.

Distribution throughout the period did not proceed at a uniform pace. Land seems to have been distributed in fits and starts, as indicated in Table 15 in Annex 1. After an initial surge between 1955 and 1962, distribution tapered off substantially until 1969. The pace picked up and peaked in 1972, after which it again tapered off until 1976. Since 1977, distribution has proceeded at a more uniform pace of about 28,000 hectares per year.

The largest amount of land -- 182,000 hectares -- was distributed under Arana Osorio, between 1971-1974 (see Table 16 in Annex 1). The least amount -- 4.500 hectares -- was distributed under Peralta Azurdia, between 1963-1966 which followed Punta del Este and the new agrarian reform law. The presidential periods are ranked as follows:

President	Period	Number of Hectares Distributed	Percent of Total
Arana Osorio	71-74	182,228	27
Ydigoras Fuentes	59-62	165,197	24
Lucas Garcia	79-82	104,652	16
Castillo Armas	55-58	99,655	15
Mendez Montenegro	67-70	64,508	10
Kjell Laugerud	75-78	43,417	7
Peralta Azurdia	63-66	4,523	1

b. Type of Land Distributed

The agrarian reform law includes five categories of land for distribution. Family parcels (Patrimonio familiar mixto) include a house, crop land, and pasture land in one unit. Crop land is titled to the family as a unit, whereas pasture land is community property to be used by the owners under conditions agreed to by them and approved by INTA. Pasture land cannot legally be divided among the individual families.

The second category -- parcelamientos -- differs from the first in that all land is titled to individual families in areas designated as zonas de desarrollo agrario. In both this category and the patrimonio familiar mixto, the size of parcel is to be sufficient to support a family.

The third category includes cooperative farms and a new modality introduced in 1980 called patrimonio agrario colectivo. Title to the land is provided not to individual families but to a group. Prior to 1980, this group had to be organized and legally recognized as a cooperative. After 1980, group title to land could be given to any group of families, regardless of their legal status as cooperatives.

The agrarian reform law provides for distribution of parcels of land that are less than family-size, called microparcelamientos. This exception to the minimum size allows for titling of land in situations where insufficient land for a family is available. This fourth category is similar to the fifth, which is urban lots. These urban house plots (lotificaciones) are provided to recipients of cooperative or microparcel land, usually in planned settlement areas.

Almost half (44 percent) of the land distributed after 1955 has been in parcelamientos located in Agrarian Development Zones (see Table 17 in Annex 1), where title is vested in fee simple to individual heads of family. A quarter of the land has been titled to agrarian reform groups, mostly in frontier colonization areas. A quarter of the land has been of the mixed type, with individual ownership of crop land and communal ownership of pasture land. The remaining 6 percent of land is distributed primarily in microparcelas scattered throughout the country, with a very small proportion in urban house plots.

Interesting differences are found in the average amount of land provided to each family in each of these types. The parcelamientos, primarily distributed prior to 1963, have the largest parcel size, i.e. 22 hectares. Cooperative farms provide an average of 17.7 hectares for each member family. The mixed family patrimony parcels provide parcels averaging 8 hectares, just slightly larger than the size considered to be a family minimum. Microparcelas average 4.7 hectares, which is smaller than the minimum but larger than most sub-family farms listed in the census.

c. Size of Parcel Distributed

Half of the land distributed has been in parcels that exceed 25 hectares in size, which is considered to be the upper limit of a family-size plot of land (see Table 18 in Annex 1). Two-fifths has been in family-size plots between seven and 25 hectares. Only eight percent of the land has been distributed in plots that are less than the minimum required for family subsistence.

One of the aspects of agrarian transformation, well-known in Guatemala but not previously quantified, is the distribution to the rural elite of significantly larger parcels of land than is contemplated in the legislation. The breakdown noted above shows that almost half the land distributed has exceeded the maximum size required by a family. The bulk of this land is in farms which are greater than 100 hectares.

The data show that the Arana Osorio period is characterized by the highest rate of distribution of large farm parcels (see Table 19 in Annex 1). Almost three-quarters of the area distributed during that period was in parcels greater than 25 hectares. During the other presidential periods, the land is much more evenly distributed by size categories.

d. Distribution of Land by Region

Two-thirds (67 percent) of the land distributed has been in the frontier lands colonization region, i.e. departments of Alta Verapaz, El Quiche, and Izabal (see Tables 18 and 19 in Annex 1). Only 12 percent of the land distributed has been in the prime South Coast area, which includes the departments of Escuintla and Retalhuleu. An additional 14 percent has been distributed in the Western Highlands.

The part of the country that has been least affected by agrarian transformation is the center and the east. The Central Highland departments of Guatemala, El Progreso, Sacatepequez, and Chimaltenango have only three percent of land distributed. The Eastern Highland departments of Zacapa, Chiquimula, Jalapa, and Jutiapa have approximately four percent of the land that has been distributed.

e. Impact of Land Distributed on the Number of Landless

One way to evaluate the impact of land distribution is to compare the amount of land distributed to the size of the landless population. This comparison will be made at three points in time for which population data are available: 1964, 1973, and 1980.

In 1964, an estimated 262,750 landless laborers existed; between 1955-1964, a total of 23,476 beneficiaries had received land (see Table 20 in Annex 1). Thus, the number of actual beneficiaries prior to 1964 represent 8.9 percent of the potential beneficiaries in that year.

Between 1965 and 1973, 9,274 families received land under the agrarian transformation program. This represents 3.5 percent of the potential target population of 267,058 landless laborers estimated on the basis of 1973 population figures.

Finally, between 1974 and 1981 17,877 beneficiaries received land. This is 5.7 percent of the total estimated number of 309,119 potential beneficiaries. (Note: The above estimates do not include permanently employed plantation workers, who had been a recipient group under the Decree 900 agrarian reform.)

D. Analysis of Current Agrarian Reform Legislation in Guatemala

The current agrarian reform law, Decree 1551 as amended, defines the types of private lands that are subject to acquisition by the government for subsequent redistribution. Farms with more than 100 hectares of idle (abandoned or under-used) land can lose that land through expropriation (Decreto 1551: Art 27-33). Areas that have been defined as rural development zones are treated differently (see Decreto 1551: Art. 47). Farm land in these areas can be expropriated if the lands exceed the amount recorded in the land registry. If untitled, the amount that exceeds the limits established by INTA for these zones can be expropriated.

Certain categories of idle land are exempt from expropriation: (1)farms of 100 hectares (or less) irrespective of the proportion of idle land on the farm; (2)farms larger than 100 hectares are permitted to have at least 100 hectares of idle land or 10 percent of their surface area idle, whichever is greater; (3)forest land not being utilized but on which there are forest stands with tree varieties at least 50 percent of which are commercially exploitable; (4)land certified by the General Forest Administration (Direccion General Forestal) to be forest reserve land; (5) zones designated as mining regions by the Mining and Hydrocarbon Administration (Direccion General de Mineria e Hidrocarburos); (6)areas designated as appropriate for urban development by the corresponding municipal government

The process for determining idle lands is labyrinthine. INTA does not in the first instance identify or delimit the idle land. The process is

initially based on sworn declarations by the owners themselves and proceeds through multiple steps of topographical surveys, technical inspections and reports, etc. If land is finally found to be idle (ociosa), the owner has two years to put it back into production.

Once land has been declared ociosa by INTA, farmers desirous of working the land may petition the Institute to proceed with expropriation. After a provisional notification period has elapsed, INTA may proceed with an appraisal of the land in which the owner and INTA each select their own appraisers. For establishing the value of the property, no official tax value declarations may be used. This is in contrast to the Decree 900 which employed the value declared for tax purposes as the expropriable value of the property. In cases of disagreement between the two appraisals, the National Department of Mortgage Credit Appraisal (Departamento de Avaluos del Credito Hipotecario Nacional) makes the final determination.

Once the price of the property has been fixed, INTA may proceed with the expropriation after agreeing to pay the full value of the property in cash, in five equal annual installments including four percent annual interest. However, if INTA decides that it is not in a financial position to undertake the expropriation of the land at that moment, it can offer to the landowner the option to put his land in production following a plan established by INTA for that purpose. In such cases the expropriation proceedings are suspended.

This legal framework is inadequate for carrying out the stated or ostensible purpose of the law. The procedures are time-consuming and elaborate, and have had the effect of primarily protecting the owners of idle lands. Also, the INTA office charged with implementing the idle lands provisions of Decree 1551 has traditionally been understaffed and underfunded. Indeed, INTA has not expropriated any appreciable amount of arable land since the law was passed.

The idle land tax provisions of the law are somewhat less cumbersome. Lands which have been declared idle are subject to an annual tax of between Q0.75 and Q2.50 per hectare; the better the quality of land, the higher the tax. The tax increases each year, progressing from a 20 percent surcharge in the second year through an 80 percent increase beginning in the fifth year.

However, this section of the law has not been fully employed. Between 1963 and 1972, only 263 farms were assessed an idle lands tax; most of the taxes owed were unpaid and government decrees in 1972-1973 exonerated all delinquent land owners from the payment of such taxes (Farfan 1974: 160-169).

The law also provides for distribution of public domain land. Various conditions are attached to such land transfers: e.g. the land must be directly cultivated by the beneficiary; parcels cannot be divided without prior

approval of INTA; and parcels cannot be transferred without INTA's approval. Recipients of land receive provisional title upon payment of ten percent of the value of the land. The balance of the cost of the land is to be paid off on in annual payments over a period of ten years.

It is instructive to note that this portion of the law has been applied more effectively than the idle lands provisions. As noted in Section C above, the majority of land distributed has been in colonization areas. Furthermore, INTA has applied the payments requirement of the law far more vigorously than the idle land tax provision. According to official INTA records, between 1970 and 1981, INTA took in Q5,334,609.50 for payments on land parcels distributed. During the same period it took in only Q601,762.05 in idle land taxes.

INTA has taken in nine times as much in land payments as it has in idle land taxes. In other words, Decree 1551 has provided a legal framework that makes it possible to collect funds from the rural poor but makes it difficult to collect the idle land tax from the rural landed elite.

E. Colonization of the Franja Transversal: Assessment of an AID-supported Program

1. AID Loan 520-T-026[2]

One of the major efforts of the Government of Guatemala and USAID/Guatemala to address the problems of high population density on marginal

lands and sub-subsistence minifundia holdings involves support of colonization of lands in the Northern Lowlands. Part of the Small Farmer Development Project is designed to move landless and landpoor farm families from the Highlands onto family-size plots within the Franja Transveral del Norte (FTN). The FTN stretches across the northern portions of the departments of Huehuetenango, El Quiche, Alta Verapaz and Izabal (see Map 2).

This project was preceded by two examples of successful resettlement in the FTN, one somewhat planned and the other spontaneous. Maryknoll missionary priests working in the Highlands of Huehuetenango helped establish a series of settlements in the Ixcan section in the western end of the FTN. Approximately 1500 Indian families moved from the Highlands to the Ixcan with virtually no technical assistance and a modest budget. Toward the other end of the FTN, in Sebol in Alta Verapaz, spontaneous settlers moved into the area following a newly opened road to oil exploration sites. In both cases, the settlers began to adapt their agricultural practices to the different agronomic conditions of the Northern Lowlands.

In 1975, USAID/Guatemala in cooperation with the Guatemalan National Planning Council contracted for a study of potential agricultural settlement in the FTN. As details of the study were presented to the mission, a project paper was written which resulted in the signing of a loan agreement. The FTN Land Resettlement portion of the agreement, with counterpart funds, totalled $7.3 million for settlement of 5,000 families on 50,000 hectares of public domain lands over a five-year period. The project included infrastructure development, technical and social services support, and the establishment of multi-purpose cooperatives.

As of August 1982, over a year after the original terminal disbursement date, the project has not been completed. About 2,000 families have been settled and there have been numerous delays and problems with implementation. Early in the project it became obvious that the agronomic study and the accompanying recommendations were less than satisfactory. Plot sizes for settlers were increased to assure adequate size holdings for families to support themselves, while several areas proved too swampy for settlement.

Agencies of the Guatemalan government did not provide adequate support in the areas of education, health, agricultural extension and infrastructure support; and badly needed U.S. technical assistance, particularly in the adaptive research, agronomic and field crop elements of tropical agriculture, was very limited. Several factors contributed to the shortcomings of performance by Guatemalan government agencies. There were problems of isolation and climate which made the placement of government workers difficult. Inappropriate machinery and techniques were often applied to problems, irrespective of the settlers' opinion and capacities to contribute to solutions of these problems. And the slowness of processing paperwork, by both AID and the Guatemalan government, especially vouchers for reimbursement of funds to cooperatives, caused some phases of the project to be unduly delayed.

Finally, the level of political and military violence within the project area in the period December 1981-March 1982, made it much more difficult for contractors and government agencies to operate effectively. Work was stopped in the project area by military authorities in February 1982 for several weeks. During this period perhaps as many as 400 families left the project site, with two villages being evacuated. One other, Trinitaria, was burned to

the ground. Since the change of government in March, the military authorities in the project area have been considerably more cooperative and helpful, though difficult on the distribution of food for food-for-work activities. Farmers in the FTN reported that the military had confiscated stockpiles of corn "to keep it from the guerrillas." It should be pointed out that the Guerrilla Army of the Poor (EGP) has been active in the project area since its formation in 1975.

Given these problems, this project cannot be termed a success, at least thus far. It has had successful aspects, however, which can be built on. There are also lessons to be learned (see ACDI report, 1982). In addition, since the change of government in March, the project in virtually all its aspects has picked up substantial momentum.

The strongest part of the project centers on the response of ~~peasants~~ the poor farmers to the opportunity for settlement of new lands and their capability to organize themselves for the completion of project activities, such as construction of schools, roads and community facilities. The popularity of this type of colonization project is reflected in the fact that there is a list of about 1000 prospective colonizers who are still waiting to be settled in the project area. Second, the multi-faceted supportive role of the Federacion de Cooperativas Agricolas Regionales (FECOAR) in project implementation progressively improved after some initial problems and confusion. Overall FECOAR became quite effective, as was the unit in INTA which processed the land titles. About 1425 titles were issued to the settlers.

The need for detailed agronomic and climatic knowledge cannot be too strongly emphasized. Also, planning must not yield unreasonably rigid project timetables and designs which cannot be altered to changing conditions. Finally, the utilization of resources, human, financial and institutional, must be better coordinated for purposes of development.

2. Survey of Colonization Beneficiaries

In March 1982, INTA conducted a survey of all of the heads of household in the project area. The survey consisted of two parts. First, it contained questions designed to gather basic socio-economic and demographic data, information on migration, production data, and a list of the most urgently felt community needs. Second, the survey instrument was accompanied by a legal document which the respondents were asked to sign. The purpose of this document was to have the settler swear that he/she meets the legal requirements for being entitled to INTA land (i.e., to be indigent and landless). In an effort to get a clearer overall picture of the settlers than was possible from visits to the site, the team decided to analyze the first portion of this survey. Time and manpower limitations forced us to take only a ten percent sample of the nearly 1,600 interviews and to restrict our analysis to the demographic and socio-economic data in the survey. Coding of the production data would have proven too time-consuming, while the section of the questionnaire regarding urgent needs of the settlers was so poorly constructed that we did not feel that there was much purpose in analyzing it. Despite these limitations, we feel that the sample is an accurate reflection of the universe of settlers[3]. Our data bank consists of 158 interviews.

There was a surprisingly wide range of ages among the settlers. The youngest head of household was 16 and the oldest 69. Grouped by ten-year age categories, the age distribution is as follows:

Age Categories		Per cent
10 thru 20	19	12.1
21 thru 30	51	32.5
31 thru 40	38	24.2
41 thru 50	29	18.5
51 thru 60	12	7.6
61 thru 70	8	5.0
(One case of missing data)	157	100.0

As can be seen from the table, the largest number of settlers are in the 21 thru 30 year category (32.5 percent), the age group which is probably most capable of enduring the hardships of colonization. However, there are a substantial number of heads of households who are older than forty, and 12.6 percent who are over 50 years of age. The average age was 34.5 years. It is likely, however, that these older settlers already have children old enough to help with work on the farm, although we did not have enough time to include family data in our data bank.

Most of the settlers are married or live in common law unions. We found that 41 percent of the settlers have a common law union and an additional 38 percent are married. Only 15 percent are single, and the remaining settlers were either widowed, separated or divorced.

Very few of the settlers were living in the project area prior to their receiving a parcel from INTA. In all, only five settlers (three percent of the total) resided in El Quiche, the department in which the project is located, prior to receiving their land. The largest number of settlers, however, came from nearby Alta Verapaz (36 percent). An additional seven percent migrated from nearby Baja Verapaz. The second largest department of residence prior to moving to the project area was Escuintla (11 percent). No other department yielded more than ten percent of the settlers. Migration from the South Coast to new lands in the North and El Peten is a common pattern in Guatemala. Grouping the departments of Escuintla, Suchitepequez, Retalhuleu, and San Marcos as a South Coastal region we find that 23 percent of the settlers follow this pattern. Hence, the majority of settlers came from either the South Coast or departments neighboring El Quiche.

Turning now from the demographic to the socio-economic characteristics of the settlers, we find that they are virtually all disadvantaged and very poor. Fully two-thirds of the heads of households (66 percent) are illiterate. An even larger proportion (89 percent) have fewer than three years of formal schooling. Only three percent of the heads of household have completed the sixth grade.

It is not surprising to find, given the frontier nature of the region, that most settlers live in primitive conditions. A few of the settlers have access to a potable water system. Fewer than one quarter (23 percent)

have self-contained water systems (using collected rain water). An additional 9 percent take their water from a well. The remaining 68 percent of the settlers draw their water from rivers and streams. A further indication of the rustic nature of the settlement is that none of the settlers had electric lights in their homes, and only 20 percent used some type of kerosene or gas lantern. The remaining settlers use candles or kerosene lamps to illuminate their homes.

Nearly half (49 percent) of the colonists have corregated tin roofing; the remainder have straw and/or palm frond coverings for their houses. A small minority (15 percent) of the houses have walls made of lumber; the great bulk live in dwellings constructed of rough hewn poles tied together with straw or string. Finally, sanitary conditions are poor in the project area, e.g. only six percent of the settlers report having a latrine.

There are few surprises in this overview of the socio-economic and demographic characteristics of the settlers. By definition, all of the beneficiaries are indigent, and all have moved to the colonization site within the past few years. The interview data presented in these pages confirms the structure of poverty which is well-documented by Fledderjohn and Thompson (1982).

3. New Lands Settlement; Costs and Benefits

It remains to appraise the relative costs and benefits of this pilot colonization project. This is particularly important because

this GOG/AID project represents the only source of current information for estimating costs and returns of land colonization of poor campesino families in Guatemala.

a. Costs

First, detailed complete cost records were not maintained for the public sector investment in settling colonizers. Where the records were not adequate, persons who worked on the project in managerial and advisory roles were asked to provide estimates.

For estimating costs, settlement activities were broken down as follows:

1. Recruitment, selection, transfer and initial support.
2. Land surveying (blocks, perimeters, townsites, farm plots, roads and pathways).
3. Public Infrastructure.
   a) Aldea schools (3 rooms)
   b) Center schools (6 rooms)
   c) Health posts (one per center)
   d) Public program facilities construction (offices, shops, warehouses, living quarters, plant nurseries, etc., for INTA, and DIGESA, and other facilities providing staff services to colonizers).
   e) Aldea drying floors (for coffee drying and general community uses).
   f) Potable water system (centers, aldeas).
4. Cooperative facilities construction (offices and warehouse space).
5. Roads.
6. Credit
   a) Grubstake credit for land clearing and construction of shelter.
   b) Operating credit for first year.
7. External technical assistance (ACDI).

Except for grubstake credit and first-year farm operating credit, the above categories do not include farm operating capital requirements. Actual and estimated costs on a per family basis by activity category are shown in column I of Table 5-1.

TABLE 5-1:Actual/Estimated Settlement Costs for Pilot Colonization Project in the Franja Transversal del Norte, and Projected Future Costs, Per Family and Per Hectare, In Dollars, Guatemala, 1982

	Cost Base ($)	Number of Families Involved	I Act/Est. Cost Per Family ($)	II Projected Future Cost Per Family ($)
A. DIRECT COSTS				
1. Recruitment, Selection, Transfer and Initial Support	850,000	1,500	567	400
2. Land Surveying (Blocks, perimeters, town-sites, farm plots, roads)	1,000,000	2,000	500.00	200[1]
3. Public Infrastructure Construction				
a. Aldea Schools	17,000 each	60	283	125[2]
b. Center Schools	34,000 each	875	39	39
c. Health Posts	24,000 each	875	27	27
d. Program Facilities (Offices, shops, warehouses, living quarters, etc.)	500,000	3,500[3]	143	143
e. Aldea Drying Floors	2,000 each	60	33	33
f. Potable Water Systems				
- Centers	10,000 each	875	11	11
- Aldeas	5,000 each	60	83	83
4. Roads	2,226,000[4]	3,500	636	636[4]
5. Cooperative Facilities	116,000	3,500	33	33
6. External Technical Asst.	507,000	2,000	254	254[5]
- Sub-Total			$2,609	$1,984

B. INDIRECT COSTS				
7.- General GOG overhead	Estimated at 50% of direct		1,305	992
- Sub Total	-cost per family		$3,914	$2,976
	-cost per hectare		$373	$ 283
C. CREDIT COSTS				
1. Land preparation	Clear 3 hectares at $50/hectare	per family	150	350
2. First Annual operating credit	$500	per family	500	500
D. TOTAL COSTS	-cost per family		$4,564	$3,826
	-cost per hectare		$435	$364

1 Using Metes and Bounds system instead of optical (transit) surveying methods.

2 Settlers finish school construction after roof structure and floor are completed by contractors.

3 Number of families for which pilot program designed.

4 Access to the project site benefited considerably from prior and continuing work on principal access roads from Sebol to Xalbal by the oil companies, the Military and INTA. If future projects do not benefit from similar road construction financed from other sources, road construction costs per family could increase substantially.

5. Technical assistance mix should shift from major focus on planning and administrative support to agricultural production and local organization.

Since the project on which these cost data are based was experimental in nature, it is reasonable to assume that if the lessons learned in the pilot effort are applied in a continuing program, cost reductions can be achieved. Column II of Table 5-1 represents best estimates by those who were involved in pilot project implementation on cost savings that could be achieved in future new lands settlement programs.

These data indicate that actual pilot project costs, excluding credit, totalled $3,914 per family ($373 per hectare). This figure represents sunk (non-recuperable) costs. Total investment, including requirements for first-year credit, is $4,564 per family ($435 per hectare). Best estimates suggest that somewhat more than 50 percent of the first-year credit granted may be recuperated. Thus, the estimate of total sunk costs is $4,239 per family ($404 per hectare).

Project personnel estimate that future programs can realize cost savings in the categories of 1)recruitment and selection, 2) surveying, and 3) aldea school construction. They also believe that additional grubstake credit (Q200) is required for materials for shelter construction. Applying these adjustments to the costs of the pilot project, the following costs are projected for continuing settlement programs:

1) Excluding first-year credit

a) per family	$2,976
b) per hectare	$ 283

2) Including first-year credit.

a) per family	$3,826
b) per hectare	$ 364

b. Returns.

The GOG receives virtually no direct returns from the pilot project. Settlers are required to pay only Q160 for the land received, with Q16 payable on receipt of provisional title and the balance of Q144 payable in equal annual installments over 20 years, without any interest charge. The only significant returns are to settler families from agricultural production.

Net returns to the family were developed from a combination of crop budgets prepared by Ingeniero Xuan (BANDESA) in 1981,[4] and information from persons knowledgeable and experienced in agricultural production in the project area.[5] BANDESA has not had sufficient lending experience in the region to have developed wholly reliable crop budgets for the region. We thus used crop budgets from similar nearby areas (Coban and Fray Bartolome de Las Casas) for additional perspective.

For purposes of analysis, three sets of cropping plans and budget projections were prepared. Utilizing the BANDESA budgets as base information, projections classified as 1) most optimistic, 2) most likely, and 3) most pessimistic, were prepared, both for cropping plans and for crop budgets. Variables considered were; 1) rate of and total amount of land brought into production, 2) costs of production, 3) yields, and 4) prices.

This above approach was used in lieu of a single set of crop plans and budgets because of:

1) Lack of prior recorded agricultural production experience in the area,

2) Inexperience of the colonizers, e.g., the colonizing families had no prior experience in the area, and many had no prior experience as managers of their own farms, and

3) Downward price trends for major crops being produced for export.

Cropping plans were prepared for four crops: coffee, cardamom, corn and pasture. BANDESA budget information was not available for deriving pasture costs and returns; they are based on knowledgeable judgments.

Cropping plans and criteria applied to the three crop budgets to obtain the three different projections were as follows:

BANDESA budget labor requirements and hired labor costs were accepted unchanged for all budgets. However, it was assumed that all labor would be family labor for food crops, and 50 percent would be family labor for permanent crops. It also was assumed that subsistence requirements for family labor are equal to two-thirds of the BANDESA specified hired labor wage rate

for the area. Thus, family labor is included in the budgets as a family subsistence cost. This means that net returns shown in the budgets are returns after paying for family subsistence expenses. In addition, an interest charge has been included in the budget for the full amount of crop production expenses. Therefore, net returns shown are returns to land, permanent improvements, working capital, management, equity and profits. These returns are available for increased family consumption or investment.

Differences in cropping patterns among the three projections are as follows:

Cropping Pattern (hectares)

Projections	Coffee	Cardamom	Corn*	Pasture*	House, Wood lot, waste, fallow.
Most Optimistic	2	3	2	3	0.5
Most Likely	2	3	2	2	1.5
Most Pessimistic	2	2	2	2	2.5

*Corn and pasture will rotate on a 2 corn-3 pasture or 2 corn-2 pasture rotation.

Differences in rates of bringing land into production for the three projections are as follows:

Year Brought into Production

Projection	1	2	3	4	5	6	7	8	Total
Most Optimistic	2 has	3 has	2 has	-	2 has	1 has	-	-	10has
Most Likely	1 ha	2 has	1 ha	1 ha	1 ha	2 has	-	1ha	9has
Most Pessimistic	1 ha	2 has	1 ha	1 ha	1 ha	1 ha	-	1ha	8has

1) The "most optimistic" projection includes input levels, yields, and prices called for in the BANDESA budgets referred to earlier, for all crops budgeted.

2) The "most likely" projection reduced fertilizer use by 30 percent for coffee (no fertilizer is used for cardamom and corn) below that in the BANDESA budgets, yields were reduced by 25 percent for all crops from the "most optimistic" levels, and prices remained the same as for the "most optimistic" levels.

3) The "most pessimistic" projections are the same as the "most likely" except that for corn, yields were reduced to two-thirds of "most optimistic" yields, and prices were reduced by ten percent for coffee and by one-third for cardamom.

From the relevant crop budgets and cropping plans, cash flow projections were made by crop, by year and by hectare. These are shown in Tables 5-14, 5-15 and 5-16 in the Statistical Appendix of Annex 5, and are summarized below.

Cash Flow Projections (Quetzales)

Year	Most Optimistic	Most Likely	Most Pessimistic
1	-256	64	40
2	-38	-200	-272
3	-174	-789	-861
4	775	-24	-233
5	3,176	-199	-549
6	5,046	1,109	-851
7	6,732	2,262	1,631
8	6,648	3,278	2,011
9	6,798	3,903	2,328
10	6,798	4,390	2,478

Internal rates of return on the actual/estimated and the projected costs of colonization, for the three cash flow projection levels are as follows:

Projected Internal Rates of Return (ROR)

Cash Flow Projections	Internal Rate of Return by Actual/Estimated Colonization Cost of Q4,564	Internal Rate of Return by Projected Colonization Cost of Q3,826
	(%)	(%)
Most Optimistic	29.42	32.71
Most Likely	8.76	10.96
Most Pessimistic	0.86	2.72

These projections suggest that under the "most optimistic" cash flow projections, rates of return are quite satisfactory (30 to 33 percent rounded). It should be kept in mind that these returns accrue to the poorest segments of Guatemala's rural society since most of the colonizers were under - or unemployed agricultural workers when they were recruited.

The projected ROR under the "most likely" cash flow projections are considerably less satisfactory at a nine to 11 percent (rounded) yield. This is considerably less than the open market cost of credit in Guatemala today (16 to 22 percent). Nevertheless, since economic and social benefits from this type of colonization accrue to the poorest segments of rural Guatemala, these benefits may well be considered to justify the lower ROR.

Even under the "most pessimistic" cash flow projections, ROR remains positive at one to three (rounded). This compares favorably with other colonization efforts in Latin America. Derived economic benefits, such as bringing new land into production and expanding the purchasing power of a segment of the population, and derived social benefits, including the prestige of land ownership and greater opportunities for future generations of the beneficiaries, will accrue to the population from this type of colonization. It is reasonable to assume that the GOG might consider at least this level of subsidy to be justified.

Endnotes

[1] The estimate for the number of landless laborers for 1950 age 20 and over was computed in the following manner. From the Economically Active in Agriculture population, 659,550, the number of Economically Active in Agriculture between ages 7 and 9, 10,385 was deducted, leaving 649,165 Economically Active in Agriculture age 10 and over. Using the 1973 percentage of Agricultural Laborers within the Economically Active in Agriculture, 50.9 percent, the number of Agricultural Laborers for 1950 was estimated to be 330,425. From the estimate of Agricultural Laborers, 330,425, the number of Agricultural Laborers ages 10-19, 81,945 was deducted, corresponding to 24.8 percent of the Economically Active in Agriculture between Ages 10 and 19.

669,550	1950 Economically Active in Agriculture
- 10,385	Economically Active in Ag. Age 7-9
649,165	Economically Active in Ag. Age 10 and older
x.509	% Ag. Laborers in Econ. Active in Ag. 1973
330,425	Ag. Laborers Age 10 and older 1950
x.248	% Econ. Active in Ag. Ages 10-19, 1950
81,945	Ag. Laborers Age 10-19, 1950
330,425	Ag. Laborers Age 10 and older, 1950
- 81,945	Ag. Laborers Age 10-19, 1950
248,480	Estimate of Ag. Laborers Age 20 and older, 1950

Note that the estimated number of colonos is not subtracted from the estimate as it was done in table 7 because colonos were a prime beneficiary of Decree 900

[2] This section draws heavily from personal interviews with David Thompson and David Fledderjohn of Agricultural Cooperative Development International; their Final Report, Northern Transversal Strip Land Resettlement Project; and the unclassified Guatemala 5605 cable of July 27, 1982, drafted by Larry Laird of the Office for Rural Development, USAID/Guatemala.

[3] We employed a "systematic sample of elements" to select the questionnaires to be included in our data bank. This involved selecting every 10th questionnaire and coding it. In this way we were able to assure that our sample covered all of the aldeas in the project as the questionnaires from each aldea were bound together in separate folders.

[4] Bandesa, "Costos E. Ingresos de Produccion", Guatemala, 1981.

[5] David Fledderjohn and David Thompson, ACDI.

PART III. FUTURE PROSPECTS

A. Macro-Assessment. This Part of the study is broadly prescriptive, not program specific. The scope of work for the team -- which we have carefully tried to adhere to -- asks us to "describe and compare possible alternative AID project strategies such as colonization, agrarian reform and improved agricultural technology on current holdings." What we have sought to do below then is to take a broad and strategic look at alternative program and/or project options, making some initial judgments on what might be feasible and drawing attention to the areas and problems where follow-up investigation and analysis are needed. In effect, we have sought to do a macro-assessment of available options, hopefully consistent with and drawing on the findings in Parts One and Two, while leaving to others the tasks -- as the Guatemalan Government and US Mission see fit -- of program development and project design.

B. Parameters. The Minister of Agriculture on more than one occasion specifically stated to the team members that the agrarian reform policy of the Guatemalan Government explicitly excludes expropriation of privately-owned lands in productive uses. It indeed seems clear that the GOG does not presently contemplate a land reform program along the classic lines of government intervention in land ownership-land tenancy relations,

expropriating privately owned lands in production, and distributing them to other producers, or cultivators. The extensive land reform experience of this broad character in other countries in this century, such as in Mexico, Japan, Taiwan, South Korea, Bolivia, South Vietnam and now El Salvador, would thus appear to have only marginal relevance to the tasks at hand in Guatemala.

We accept this limitation as a given, for reasons of both substance and prudence. The United States risks ineffectiveness and counter-productive relations with a host government by getting ahead of the latter, in effect, finding itself in an out-front advocacy position, on sensitive domestic policy issues such as land reform. Questions concerning the character and pace of structural social and economic change in a country, as mirrored in an agrarian reform program, are best left to the host government. The U.S. role, especially if linked to prospective and concessional external resource transfers, is certainly an important factor, but should be viewed as secondary to Government decisions and will to follow the path of change it chooses.

However, no one can doubt the deep dualism that permeates Guatemalan rural society with respect to ownership of and access to the land. As set out in Part I, minifundization, or fragmentation, of land holdings for the large number of primary producers has progressively increased over the past thirty years; to the extent, that in 1979, 78 percent of all farms in Guatemala were under 3.5 hectares, while occupying but 10 percent of the land in farms. On the other end, land concentration is equally dramatic with farms of 450 hectares and larger, constituting less than one (1) percent of the farms, but containing 34 percent of the land in farms. The pattern of land concentration is further intensified by the fact that the farms which have the higher

quality lands under cultivation generally are found where land concentration is the greatest. And last, the dualism is reflected in the amount of idle (abandoned or not in production) arable lands which exist on large private holdings, approximately 1.2 million hectares as estimated in the 1979 Agricultural Census, in the face of severe land scarcity among the large mass of rural poor.

In some part, this dualism is a reflection of a traditional skewed division of assets between a largely subsistence sector composed of Indian and Ladino rural poor, which has not been effectively integrated, with a few exceptions, e.g. wheat and vegetable farming, into the mainstream of the Guatemalan economy, and a modern sector which is dominated by commercial agriculture and import substitution light industry.

Yet this does not fully capture the extent of Guatemala's dual society. An excessive 3.2 percent population growth rate per annum increases malproportion in the distribution of income, as well as generating unrelenting land pressures in the subsistence sector. Cultural and ethnic distinctions reinforce economic inequalities, and conservative Guatemalan leadership groups distrust social change, seeing it more in conflict terms rather than as a moderate process calculated to blunt and eventually dissolve the extremes of dualism.

However, there is still momentum for change in Guatemalan society, and amoung its leaders. This momentum is being energized in part by negative factors such as the insurgency in the Highlands and Northern Lowlands, the El Salvador reform model next door, and the depressed state of the economy.

There are positive factors at work as well such as changes in social values among more than a few of the large landowners, a more enlightened perspective of national unity and welfare on the part of the senior leadership of the present government, and an apparent growing awareness in the military of the absolute need of the support and confidence of the Indian population if the insurgency is not to be interminably prolonged. These factors to be sure are equivocal, or less than clear-cut, but they merit support.

C. Agrarian Change Options. Our approach to the options which we discuss below is to build-on the factors of change noted above while not going beyond the policy confines layed out by the Minister of Agriculture. The intent is to develop programmatic ideas, or alternatives, which though they may not be decisive in their impact on the pressing land problems in Guatemala -- some will call the alternatives "minimalist" -- do stand to reinforce, and take advantage of, the forces of change which over time may lead to definitive solutions.

To this end, we discuss three options below: 1)the development of a commercial land market in Guatemala; 2)a strategy for further program efforts in land colonization; and 3)the feasibility of the "La Perla" experiment of converting privately-owned agricultural estates into joint worker-employer enterprises by allowing the permanent agricultural workers to purchase shares in the ownership of such enterprises.

These options are not mutually exclusive. Nor is it our intent to necessarily choose between one or another, though it will be clear as to which we feel, prima facie, has the most merit.

In the last section on suggested actions by the Guatemalan Government, we discuss what in effect is another option, but one solely for the government to consider and act upon: the redesign of present agrarian reform legislation so as to facilitate the distribution of idle lands.

D. The Development of an active Commercial Land Market in Guatemala. This option is elaborated and appraised in some detail in the latter part of Annex 5 and in Annex 6. We limit ourselves here to the highlights and some of the important implications of this more extended statement.

The purpose of developing an active commercial land market in Guatemala would be to provide means by which substantial numbers of landless and land-poor campesino farmers could gain access to family-size parcels, even though they have only limited funds for down payment. The land market that presently exists in Guatemala is small in scope and virtually excludes campesino families from participation. Essentially, there are no formal institutional sources for the financing of land purchases by small farm buyers. The informal means that are available -- the moneylender, borrowing from family or friend, or seller financing of the purchase -- by their very nature restrict the market and make it too dear for all but a very few of the small farmers.

The land market on the other end, that is, the commercial buying and selling of big farms as units, or as relatively large tracts, has also been limited in Guatemala. Bank financing is expensive and contingent on extensive assets other than the farm property itself to secure the loan. This market is unusually slack at the present time as well because of depressed economic conditions and the insurgency.

Clearly, an effective institutional financial system or structure that has heretofore been lacking, would be imperative for activating and expanding a commercial land market which would serve the policy purpose of movement toward a significant voluntary redistribution of land assets in Guatemala in favor of the small farmer.

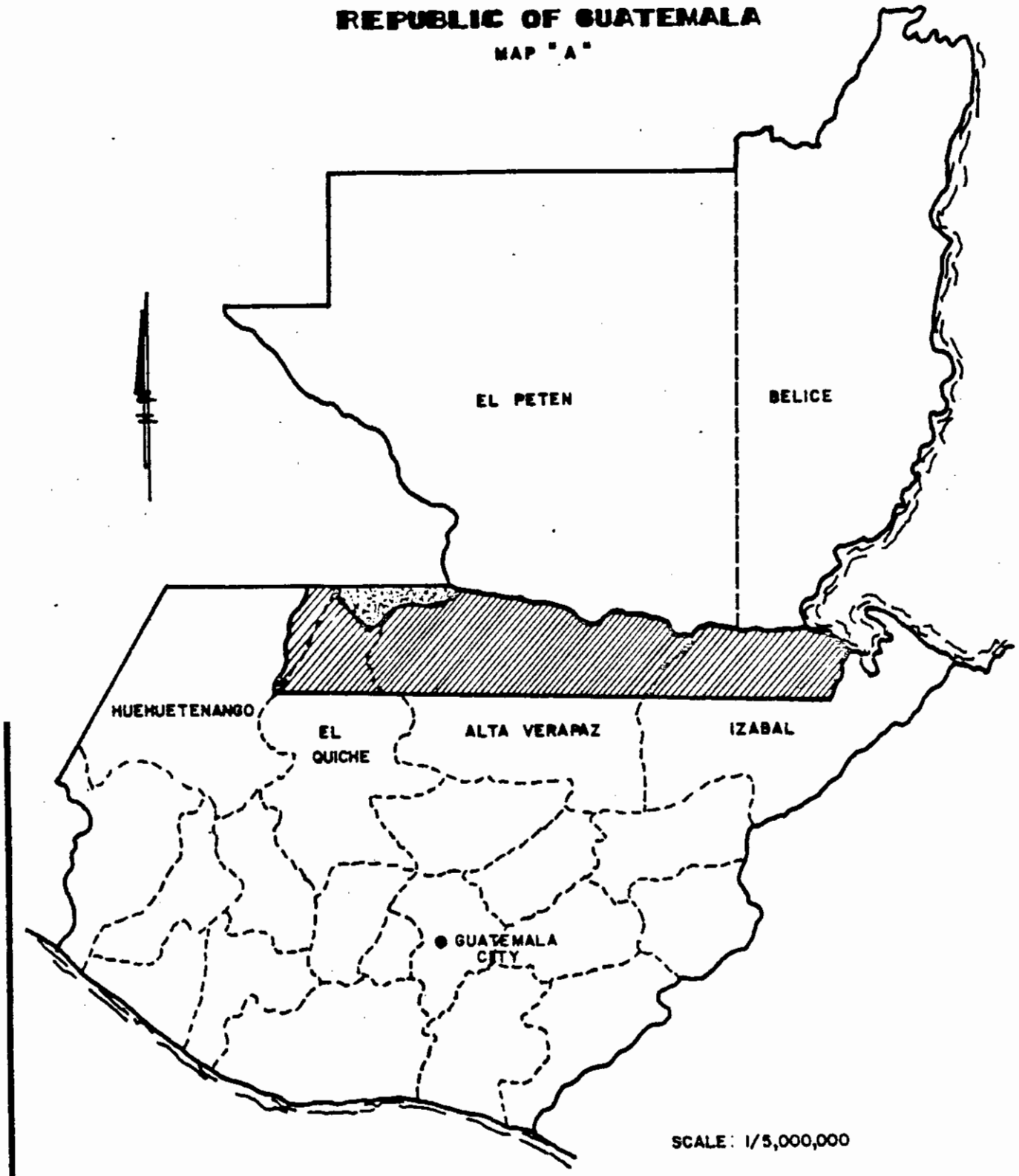
It first should be ascertained, however, whether in the present Guatemalan setting there are large farm owners with significant amounts of productive, or potentially productive, lands which they would be willing to put on the market if a financial mechanism existed to facilitate fair and expeditious land transfer. Similarly, it would have to be ascertained if the effective demand exists among the target group of landless and land-poor farmers to purchase the lands.

Neither of these questions can be answered in a systematic, definitive way within the time frame and scope of this assessment. A follow-up study on the feasibility of this land market approach would clearly be necessary. The study group would focus on exactly the above types of questions, including the vital one of the behavior of land prices*, and would as well collaborate

* See the AID Evaluation of the Land Sale Guaranty Programs in Ecuador and Costa Rica (1975), by Goldstein and House, for a discussion of the problems these types of questions presented in private sector land transfer programs in these two countries.

MAP OF THE REPUBLIC OF GUATEMALA

MAP "A"



closely with representatives of the Guatemalan private sector -- e.g. landowners and the banking community -- and with government officials.

We would emphasize here however that one of the reasons we have pursued the land market option so assiduously is that our initial soundings have been that there is indeed a surprisingly ample potential land market of sellers and buyers if a facilitative financial system were to be established. A random sample of knowledgeable Guatemalan opinion clearly indicated that substantial amounts of productive land would be offered for sale by private owners of large farms if realistic conditions of sale obtained. Some of these lands are in the Highlands and Northern Lowlands. More are in the Boca Costa and Costa Baja. They tend to be under-utilized and in some part are likely already spontateously settled, particularly in the Highlands. They are principally in cash crops such as coffee, sugar and cotton. Some are in a more or less quiescent state; that is, still productive but in a condition of gradual abandonment with the owners not making recurrent or new investments, but only seeking to realize the income possible with minimum capital outlays.

INTA alone has offers of sale of some sixty eight (68) Fincas averaging nearly 800 hectares each. The majority of these are located in Alta Verapaz and several are in the Highlands and Izabal.

The reasons given for the apparent readiness of substantial numbers of large farm owners to sell are varied but can be summarized as follows: 1)unstable politico-security conditions; 2)high-short term debt loads which

existing levels of farm income cannot service; 3)depressed international prices for most large farm export crops combined with mounting input costs, a crunch exacerbated by the low efficiency of labor utilization on large farms which suffer from diseconomies of scale in labor use; and 4)the reduced attractiveness of owning farmland for financial security and as a hedge against inflation under present economic and political conditions.

The demand side of the market also, on balance, looks hopeful. The consensus view among those we talked to was that there would be no shortage of prospective small farmer buyers who had the assets, or the near-term potential to earn them, if appropriate financing was available. It was felt however that interest rates would have to be subsidized so that the small farmers would not be paying more than 8 to 12 percent; that nominal down payments should be the rule; and that institutional support and assistance from cooperatives and organizations like the Fundacion del Centavo would be needed in the promotion, arrangement and negotiation of purchase by the small farmers. It could be added that there are now at a minimum 50,000 Highland small farmers of modernizing, entrepreneurial bent who are cultivating labor intensive, high market value crops, rather than subsistence level basic grains -- which is a hopeful sign in and of itself. We would also note that for a first-time observer of the rural scene in Guatemala the most striking aspect of rural life is the pent-up demand for land on the part of the rural poor.

The specific character of the financial system best suited to energize and service a commercial land market in Guatemala again is a matter that would

have to be dealt with in some detail by a follow-up study. We have suggested in Annex 6 a "land mortgage company" with minimal government involvement, and set out some of the features which we would think might characterize its functions and procedures.

Responses were positive among the limited number of people knowledgeable about land conditions in Guatemala which we talked to about a land mortgage company. It was generally felt however that a significant amount of the initial capitalization of the company would have to come from soft money sources. It was also urged that any effort to establish a land market financing system first be tested on a small scale until needed experience is gained -- advice with which we fully concur.

We have also estimated in Annex 6 the magnitudes of funding that would be required from domestic and external sources in order to provide a rough picture of what the financial parameters of a project like this might look like. However, the most important aspect to focus on at this time is not these useful but soft financial projections, but rather the advantages or positive factors that prima facie recommend serious consideration of voluntary land redistribution on existing productive lands, that is, the land market option.

First, the option stands to be considerably less expensive than settlement

on new lands through colonization programs. Based on the analysis in Annex 5, target group small farm families can be settled on existing farm lands through a financially viable land market system at approximately 20 percent of the costs of settling farm families on new lands. In addition, the internal rates of return on net cash flows -- after land amortization -- are markedly higher with the land market system.

Second, establishing farms in areas familiar to the farm families, with less distance to travel, has a distinct psychological advantage over having to resettle on remote, unfamiliar lands. Similarly, working in a familiar natural setting with established cropping practices should diminish risks for the new entrepreneurs, particularly since they are able to emulate their neighbors or previous owners. Having already established sources of supply for production inputs and services, as well existing market channels, however rudimentary they might be, also cuts back on the risks.

There is the further important advantage of the land market alternative of self selection of participants. The alternative should produce groups of buyers of similar backgrounds and interests, facilitating organization and cooperation in the newly established communities.

There are also significant advantages that figure to accrue to the current large landowners (or sellers) such as the use of accumulated labor benefits ("pasivo laboral")* of their permanent workers as partial payment, which would ease land sale transactions. Also, the selling of lands in the face of growing squatter incursion problems would, in many cases, defuse potentially difficult conflict situations, as well as enhance the local stature of the landowners who are making fair offers of sale.

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* cumulative severance pay, bonuses, leave pay, etc., prescribed by law.

In addition, the land market alternative certainly should be easier and quicker to implement. Once the financial mechanism is in place, land transactions can move forward without waiting for feasibility studies, land surveys, roads construction, etc.. Further, a voluntary land market system should have need for only a minimum or secondary role for the government, thereby making it more politically palatable than other agrarian reform models which involve large-scale public interventions.

Last, the land market option appears to be timely for Guatemala. Due to political unrest and uncertainty, present relatively low land prices, and lack of other market opportunities, many landowners are likely to offer lands at fair prices. Commercial banks holding "problem" farm loans -- and apparently there are many -- would also likely support this option, or "out". Indeed, started on a modest, experimental scale, a land market system could be progressively improved as the experience of all participating institutions and parties is learned from and fed-back into the system.

E. A Strategy for Land Colonization. This section draws from, and uses as it point of departure, Part Two E of the text -- Colonization in the Franja Transversal: An Assessment of an AID-Supported Program -- as well as the excellent Final Report on this program done by its ACDI Advisors, David Fledderjohn and David Thompson -- Northern Transversal Strip Land Resettlement Project. The Team members also were able to have extensive informal conversations with Messieurs Fledderjohn and Thompson and to carry out field trips to the project area.

Given the conventional wisdom that land resettlement projects almost inevitably fail in Latin America, it was somewhat surprising to find that the internal rates of return on the actual/estimated and projected costs of the AID-supported pilot colonization project in the FTN were actually positive. Particularly, the "most optimistic" and "most likely" cash flow projections yielded rates of return of 30% to 33% rounded, and 9% to 11% rounded, respectively. Although considerably less that the rates of return of the land market option, these latter suggest that the pilot project as conceived and planned was essentially sound; a judgment confirmed by the ACDI Advisors in their Final Report. Indeed, the principal factors impeding success have been performance failures by government agencies, inadequate U.S. support, particularly technical assistance, and politico-security conditions which have impinged on the project area.

Second, the pilot project -- though still in mid-stream with regard to implemention -- also reflects benefits other than those derived strictly from costs and returns calculations. These are essentially non-quantifiable economic and social benefits such as putting new land and resources into production; providing an economic alternative for the poorest and most desperate of the rural population; the eventual multiplier effects of improved standards of living and increased cash income for the settlers who become new consumers, new producers and new employers; and the taking of people off welfare of one kind or another and giving them human dignity. This last point was dramatically illustrated by the great importance that the 1425 settlers who received land titles through the project attributed to the titles, and the quite overwhelming response of joy and dignity that they manifested at the title ceremonies themselves.

The team's collective judgment is to continue to support further Guatemalan government colonization efforts in the FTN and in El Peten, albeit selectively and under conditions which we discuss later. The reasons we came to this conclusion are not only the positive rate of return and the less tangible returns, but also others which we found compelling. First, the demand for land among the landless and landpoor is not only great but exigent. For example, FECOAR still has a list of over 1000 prospective colonizing families, mostly coming from high unemployment areas in Alta Verapaz and the Boca Costa, who are waiting to be settled in the FTN pilot project despite the recent violence and loss of life and property in the project zone. Similarly, if one visits the departmental land colonization office in El Peten, as team members did, the first thing that one notices is the large numbers of campesino families waiting in line as potential small-holder settlers -- a scene which we were assured is repeated every day.

The politico-economic requirement on the part of the government to satisfy some of this demand is pressing as well; that is, to begin to make some progress in ameliorating the land scarcity and land conflict problems of the country before they become more volatile than they are now.

Second, our data points up in the Population Trends section that the Indians in the highland departments are not as physically immobile, or resistant to relocation, as is commonly thought to be the case. If there are economic opportunities, or the possibility of gaining access to land, they tend to move. The problem has been the lack thereof of such outlets. Resettlement projects if properly planned, organized and promoted can provide these outlets.

Third, there is no better way to test the new government's commitment to building its credibility in the rural areas of Guatemala than through public programs which provide access to land for the many impoverished landless and landpoor. If a new relation of trust is to be nurtured between the government and its rural population, the former's delivery of effective services and support for land resettlement would no doubt be a major link in developing this relation.

Last, AID and Guatemalan public and private agencies have gained invaluable experience over the past five years in carrying out the FTN pilot project. This experience stands them in good stead to move forward more effectively in future efforts. From a development perspective, it would indeed seem foolish to jettison this hard won experience. One may in fact argue that there is nothing inherently defective in land colonization programs, or a determinism which dictates failure. A careful reading of the ACDI Final Report suggests rather that the independent variables are human preparation and performance, factors distinctly undeterministic in character.

However, we must be clear that we do not consider land resettlement on public lands the answer to Guatemala's severe man/land problems. Well-conceived and effectively implemented colonization schemes can help, but they do not figure to have the impact, for example, that a more broadly scoped and self-executing commercial land market approach might have. Land resettlement programs are to difficult to implement, on balance too costly, and too slow to have the impact needed. In the FTN pilot, it took five years

of arduous effort to settle some 2000 families. The project also significantly benefitted from roads built by the military and foreign oil companies. In addition, as clearly indicated in Part One, there is simply not enough arable public land to go around.

What then makes sense -- strategic sense -- for further USAID/GOG collaboration on land colonization programs. First, and by all means, the FTN pilot project should be successfully completed. GOG military support and cooperation should be assured and, at a minimum, another 1000 families settled, the 15 kilometers of unfinished roads completed, and the construction of project buildings and facilities, such as the service centers, finished.

With regard to possible new program starts in the future, there are at least three potential sites available, two in the FTN and one in El Peten, with some development of the roads required for access to the sites already in place. This is a key factor of feasibility as reflected in our experience with the pilot project. However, one might suggest a somewhat different strategy and sequence than what was followed on the pilot project.

It would be more useful and productive to build the required basic service centers first in the project area so as to have them in place when the colonizers arrive, inter alia, to help overcome their strong sense of isolation.

Second, the actual physical and demographic survey work should begin early-on, i.e. how many people there already are in the project area. There are virtually no more virgin areas in Guatemala, at least not in the FTN. A previous penetration of spontatenous settlers into the selected project area

is to be expected, as well as the need to work out an accommodation between these settlers and the new project settlers. Indeed, it appears that one must accept as a given on land colonization programs in Guatemala that spontatenous settlement cannot be stopped, and that the project planners will be better off to plan for it in the initial instance so as to be able to consolidate it in an orderly way with the new programmed settlements. Last, only after the service centers are well on their way to completion, and the bulk of the survey work and planning has been done, should the large scale recruitment and relocation of the new settlers begin.

This is not to say that the settlers should not play a major decision-making and physical role in the planning, construction and development of the facilities and overall layout of the settlement. Their on-going participation, contributions and acceptance of responsibilities are central to success. The savings on labor costs alone from their role in the construction of facilities are very significant. Rather, the suggestions above essentially concern timing; they concern the initial actions that should be taken to avoid or alleviate to the extent possible, the human suffering of land colonization programs.

F. The La Perla Experiment. This section is based on extensive discussions with the owners of Finca La Perla y Annexos and a review of their project by the team members.

La Perla is located in the mountainous and broken terrain of northwestern El Quiche about 50 kilometers north of Nebaj. Its properties are situated in a conflict zone of the insurgency. The estate itself is composed of two

principal fincas, La Perla and Santa Delfina, and constitutes a total area of 3,466 hectares. Approximately 526 hectares (1300 acres) are planted in coffee which is the major crop. There is also 69 hectares (170 acres) in cardamon, and a longer term investment in crop diversification is underway, being built principally around the expansion of land in cardamon and the planned planting of long-maturing macadamia trees.

The essence of the La Perla experiment is to redistribute ownership of the La Perla properties by converting the 350 permanent employees of the estate, representing more than 1500 people, including the employees families, into co-owners of what would be a newly incorporated agricultural enterprise. The instrument for doing this would be an employee share purchase plan whereby the employees will purchase 40 per cent of the stock in the new company. The employees' stock participation would be capitalized through loans by various banking and development finance institutions, including the Central American Bank for Economic Integration (CABEI). The plan is that the loans of the employees will be progressively amortized by the dividends generated from their 40 per cent stock ownership which will be collectively held by two intermediary associations of the new owners-employees, one for La Perla, and one for Santa Delfina. Both of these employee associations have now been established.

A second major feature of the project is the setting aside of 445 hectares (1,100 acres) on the estate in an "irrevocable trust" for the exclusive utilization of the employee associations and their members. The plan is to develop this area along lines of "an integrated rural development model", with

modern methods of crop production, initially on subsistence crops, being applied, and social services provided. Technical and managerial assistance will also be provided to the employee associations in the development of this model, to the end of creating conditions of genuine self-sufficiency for the associations and their members.

It is our understanding that the Guatemalan (private) bank, El Banco del Ejercito, has offered to assist in the capitalization of the new La Perla corporation by purchasing 5-10 per cent of its shares, and that the Inter-American Development Bank has agreed in principle to financially support the integrated rural development project. Also, the Government of the Republic of China has indicated its willingness to provide technical assistance to the employee associations.

To summarize the team's views on La Perla -- first, we reviewed incomplete financial and economic data on the overall project and were not convinced of it's viability. We concluded that without more detailed information, definite financial and economic judgments were not possible. In addition, the team was critical, or raised serious doubts, about the ability of the proposed ownership participation scheme to achieve the genuine worker participation and response sought. In effect, the plan suggested to us that "patron" management of the enterprise would appear to remain largely intact with 60 per cent of the shares still under the control of the family owners. It was difficult to see given this 60-40 split how the sale of shares would change in any basic way traditional structures of ownership and control.

Yet to be fair we were working only with the figures and information available to us. Subsequent conversations with the owners suggest that there are tenable, or at least arguable, answers to the questions and reservations we raised. In any case, the owners displayed some openess and flexibility with respect to modifications and adjustments in the project.

In short, the team feels that the La Perla project is worthy of further investigation, that more than passing attention should be given to the possibilities of providing it seed capital, or technical assistance, for support. It indeed has some attractive features. First, it is encouraging to see that an old and prominent large landowning Guatemalan family is seeking means of permitting participation of their permanent workers in the ownership of its agricultural properties and processing facilities. The project at its core is a trade-off between economic self-interest and an enlightened concept of rural economic and social change; and one which would be carried out largely through private sector change agents.

Second, although of less importance and priority than the commercial land market option, the La Perla experiment might prove amenable to a similar broad strategic approach. The idea would be to determine if there were other large landowners receptive to the ownership redistribution scheme characteristic of the La Perla project. The La Perla management has indeed offered to organize a private sector "task force" to inventory this possibility. The U.S. Mission should encourage this effort.

G. Suggested Actions by the Government of Guatemala. The Minister of Agriculture in his discussions with the team indicated the importance he

attached to the team's analysis and findings in the field of agrarian reform legislation, and that he was interested in the team's comments and suggestions in terms of any new actions or initiatives which he might take in this field.

In this regard, we would suggest the appropriateness of a redesign of the expropriation of idle lands provisions of Decree 1551 which we discussed at some length in Part Two, Section D. The problem is not only that there are large chunks of potentially productive private lands that are lying idle, but that the law as it now stands essentially is inoperable. In any case, its provisions are not serviceable if the government decides to move forthrightly to get these lands back into production, or into other hands.

The features of the present law which we suggest should be subject to review and change are numerous. For example, the time allowed the landowner to put his lands back into production -- two years -- is too long, and could be shortened. The initiation of the process of expropriation is dependent upon the voluntary actions of the landowners themselves which makes the process unrealistic from the beginning. The individuals steps in the expropriation process are also cumbersome and time consuming. And the formula which determines the amount of land that the landowner can retain in pasture should be reviewed. The formula as presently worded, permits marked under-utilization of prime lands for cattle ranching, particularly on the South Coast.

A redesign and streamlining of these provisions on idle lands so that the law represents a better balance of interests between the government and the landowners, and so that it can be made to work for the government in dealing

with this serious problem, appears to us to be a matter of considerable priority. In effect, this is another option for the government to consider. A redesign of the provisions on the distribution of idle lands so as to make them more effective is one of the principle means available to the government to facilitate, either directly or indirectly, the transfer of significant amounts of land at reasonable costs.

Such changes would complement and reinforce the effectiveness and impact of an active commercial land market program; for pressures would be placed on the large landowners either to make the capital investments required to put their lands into production, to sell them, or face expropriation. It is our guess that substantial numbers of landowners facing these choices would try to sell, if only because of the present diseconomies of scale of many large agricultural enterprises in Guatemala today, particularly the high costs and low productivity of the large wage labor force which is required for production.

Second, we suggest that a sustained effort be made by the government to increase its <u>outreach</u> capabilities in the provision of agricultural and social services to the areas of "agrarian transformation", whether the site is a land resettlement project on public lands, or a new community of small farmers who have gained their lands through commercial purchase.

The shortcomings in the delivery and coordination of services by various GOG ministries in the implementation of the pilot colonization project have already been noted in our appraisal of this project. The paucity of vital governmental agricultural services in the FTN is also noted and discussed in Annex 4. Whether the problem is a field shortage of agricultural and

livestock extension agents, soil specialists and tropical agriculture research scientists, or one of shortage of local health and education officials, or both, agrarian change programs of the type discussed in this paper simply cannot function effectively unless the outreach capacity is developed to solve, or at least ameliorate, the problems.

Not only is there a requirement to develop the institutional capacities of INTA, the Ministry of Agriculture and other related government agencies, but also to change, however gradually, the professional approach and deportment of the government asesores and tecnicos working in local areas on agrarian programs. Several Guatemalan professionals alluded to this in their discussions with members of the team, describing the problem as a traditional attitudinal "hang-up" on the part of government technicians who have never learned to identify and genuinely participate with small subsistence farmers in finding appropriate, usable solutions to their problems.

We therefore suggest that innovative training programs of different kinds and duration specifically addressed to changing over time these attitudinal and behavioral patterns -- of "paternalism" and "superiority" -- should receive high-level government consideration. In addition, the training of local para-professionals and promotores, and the upgrading of para-professionals to professional status in agricultural skills and social services, should be giving serious attention.

Third, although we have not dealt at length with the alternative of government and private sector programs to improve agricultural technology on current holdings, we would indeed urge the government and private agencies to

continue their efforts in this field, particularly with regard to the intensification and diversification of minifundia farming in the Highlands. Previous programs designed to upgrade the productivity of the Highland resource base and its indigenous population, though not always successful, have made impressive contributions to the quality of life in the Highlands. The varietal research, credit and extension programs in wheat, potato, fruit and vegetable production are outstanding examples of this. The recent AID-supported projects in soil conservation and small scale irrigation, have been equally impressive with regard to gains in productivity and employment generation. It has been pointed out by a number of agriculturalists experienced in the Highlands that the potential for these relatively simple technologies has only now just begun to be realized.

Fourth, our approach in this section has been to place primary reliance on voluntarism and private sector initiatives in seeking solutions to the serious man-land disequilibria which mark Guatemalan society today .. disequilibria that impair the vitality of its economy and the stability of its body-politic. In this regard, the government and representatives of the private sector should seriously begin to develop plans, as concomitants of the commercial land market alternative, of using the capital generated by the land transfer as a means of injecting new assets into the modern industrial and agro-industrial sector, providing opportunities for new investment, more labor-intensive employment, and greater productivity of the present under-utilized capital plant in Guatemala. There are a number of models that

can be studied on questions of inter-sectoral capital movements as related to land redistribution, such as in Taiwan and South Korea, which may or may not prove relevant to Guatemala. The important point here is to flag this issue because although beyond the purview of this study, its consideration should go hand-in-glove with the commercial land market alternative.

Finally, we have suggested a strategy in this section which is multi-faceted, including a number of options of which none are mutually exclusive. In a pragmatic sense, the best course for the Government of Guatemala in dealing with its agrarian change problems would appear to be to pursue and experiment with more than one of these options, or not to rely on one to provide definitive solutions. Within the array of possible actions, a land market program and making more effective the idle lands provisions of Decree 1551 would appear to deserve highest priority.

ANNEXES

ANNEX 1

List of Tables

TABLE 1. LAND CONCENTRATION IN GUATEMALA: 1964 and 1979
GINI INDICES*

Departments	Gini Index	
	1964	1979
National Index	82.42	85.05
Guatemala	82.08	85.90
El Progreso	77.90	81.75
Sacatapequez	68.87	73.25
Chimaltenango	78.21	80.39
Escuintla	91.95	91.97
Santa Rosa	86.32	86.64
Solola	63.03	67.68
Totonicapan	60.93	61.78
Quetzaltenango	82.90	87.41
Suchitepequez	91.76	93.58
Retalhuleu	91.12	90.75
San Marcos	73.08	75.92
Huehuetenango	71.29	69.70
El Quiche	68.13	72.86
Baja Verapaz	79.92	82.25
Alta Verapaz	85.20	82.88
El Peten	67.17	68.72
Izabal	89.31	83.65
Zacapa	83.41	86.67
Chiquimula	70.53	71.64
Jalapa	77.39	74.46
Jutiapa	75.91	75.82

Source: Computed from 1964 and 1979 agricultural census.

* The Gini Index or Gini Coefficient is a measure of the concentration of resources. When applied to land, the Gini Index is based on two variables: farm size and amount of land. The number of farms in each farm size category is compared to the amount of land in each category. In a perfectly equal distribution, the Gini Index would equal 0. The higher the index (100 is the theoretical maximum), the greater the concentration of land in larger farms.

TABLE 2A. LAND DISTRIBUTION IN GUATEMALA: 1950, 1964, 1979*

	Number of Farms			Area (hectares)		
Size	1950	1964	1979	1950	1964	1979
LT .7 hectares	74,269	85,083	166,732	28,575	32,678	55,430
.7 to LT 1.4 has.	91,581	98,658	121,351	94,554	95,428	115,116
1.4 to LT 3.5 hect.	99,779	129,115	128,587	212,090	270,693	267,902
3.5 to LT 7 hect.	42,444	52,023	51,798	197,911	242,833	240,142
7 to LT 22.4 hect.	26,916	37,025	40,378	310,915	446,564	497,858
22.4 to LT 44.8 hect.	6,125	6,631	9,131	189,916	203,508	283,158
44.8 to LT 450 hect.	6,488	7,859	12,297	813,262	915,079	1,281,854
450 to LT 900 hect	569	561	880	354,270	345,739	535,630
900 to LT 2,250 hect.	358	294	388	495,508	387,093	501,714
2,250 to LT 4,500 hect.	104	56	75	327,649	169,747	227,156
4,500 to LT 9,000 hect.	32	30	15	196,333	178,448	88,663
9,000 and larger	22	9	4	499,848	160,927	85,623
TOTAL	348,687	417,344	531,636	3,720,831	3,448,737	4,180,246

* The census of 1950 eliminated all farms of less than .04 hectare (i.e., una cuerda), whereas the 1964 census established no lower limit. The 1979 census recorded all farms irrespective of size, but at the time of the compilation of this study the farms of less than .04 hectare had not yet been processed. It is understood that there are approximately 70,000 farms of this size, yielding a maximum estimated total of 3,043 hectares of land.

A farm is defined as all land, whether owned or belonging to others, which is utilized either in whole or in part for agricultural purposes, and which is located within the geographic boundaries of a single municipality. The farm may consist of one or more parcels. See, Direccion General de Estadistica, Manual del Empadronador: III Censo nacional agropecuario. Guatemala, Abril de 1979.

All columns are rounded to the nearest whole number. Total number of hectares in 1979 differs slightly from figures in Tables 9 and 10 because of rounding error introduced by converting raw census data from manzanas to hectares.

Sources: 1950 and 1964 data, Direccion General de Estadistica, Censo agropecuario 1964, Tomo I Guatemala, 1968. Data for 1979 from unpublished preliminary tabulations from Direccion General de Estadistica, "Censo Nacional agropecuario, April, 1979: Plan Basico de Tabulaciones" August, 1982.

TABLE 2B. LAND DISTRIBUTION IN GUATEMALA: 1950, 1964, 1979*
(expressed in percentages)

	Number of Farms			Area (hectares)		
Size	1950	1964	1979	1950	1964	1979
LT .7 hectares	21.30	20.39	31.36	0.77	0.95	1.33
.7 to LT 1.4 has.	26.26	23.64	22.83	2.54	2.77	2.75
1.4 to LT 3.5 hect.	28.62	30.94	24.19	5.70	7.85	6.40
3.5 to LT 7 hect.	12.17	12.47	9.74	5.32	7.04	5.74
7 to LT 22.4 hect.	7.72	8.87	7.60	8.36	12.95	11.91
22.4 to LT 44.8 hect.	1.76	1.59	1.72	5.10	5.90	6.77
44.8 to LT 450 hect.	1.86	1.88	2.31	21.86	26.53	30.66
450 to LT 900 hect	.16	.13	.17	9.52	10.03	12.81
900 to LT 2,250 hect.	.10	.07	.07	13.32	11.22	12.00
2,250 to LT 4,500 hect.	.03	.01	.01	8.81	4.92	5.43
4,500 to LT 9,000 hect.	-	-	-	5.28	5.17	2.12
9,000 and larger	-	-	-	13.43	4.67	2.05
TOTAL	99.98	99.99	100.00	100.01	100.00	99.97

* The census of 1950 eliminated all farms of less than .04 hectare (i.e., una cuerda), whereas the 1964 census established no lower limit. The 1979 census recorded all farms irrespective of size, but at the time of the compilation of this study the farms of less than .04 hectare had not been processed. It is understood that there are approximately 70,000 farms of this size for an estimated total of 3,043 hectares of land.

A farm is defined as all land, whether owned or belonging to others, which is utilized either in whole or in part for agricultural purposes, and which is located within the geographic boundaries of a single municipality. The farm may consist of one or more parcels. See, Direccion General de Estadistica, Manual del Empadronador: III Censo nacional agropecuario. Guatemala, Abril de 1979. All columns are rounded to the nearest whole number.

Sources 1950 and 1964 data, Direccion General de Estadistica, Censo agropecuario 1964, Tomo I Guatemala, 1968. Data for 1979 are from unpublished preliminary tabulations prepared by Direccion General de Estadistica.

TABLE 2C. LAND DISTRIBUTION IN GUATEMALA BY FARM SIZE CATEGORIES: 1950, 1964, 1979*
(expressed in percentages)

	Number of Farms			Area (hectares)		
Size	1950	1964	1979	1950	1964	1979
Microfundios (LT .7 hect.)	21.30	20.39	31.36	0.77	0.95	1.33
Sub-family (.7 to LT 7 hect.)	67.05	67.04	56.76	13.56	17.66	14.91
Family (7 to LT 44.8 hect.)	9.48	10.46	9.31	13.45	18.85	18.68
Medium sized multi-family (44.8 to LT 900 hect.)	2.02	2.02	2.48	31.38	36.56	43.48
Large multi-family (900 and larger)	0.15	.09	.09	40.83	25.99	21.61
TOTAL	100.00	100.00	100.00	99.99	100.01	100.01

* Size categories, determined by the Instituto Universitario Centroamericano de Investigaciones Sociales y Economicas, are those generally utilized in most studies of land tenancy in Latin America

Source: 1950 and 1964 data, Direccion General de Estadistica, Censo Agropecuario 1964, Tomo I. Guatemala: Ministerio de Economia 1968. Data for 1979 are from unpublished preliminary tabulations prepared by Direccion General de Estadistica, "III Censo Nacional Agropecuario, Abril 1979. Plan Basico de Tabulaciones," Agosto, 1982.

TABLE 3. ARABLE LAND PER CAPITA
OPTION 1
(IN HECTARES*)

Department	Year 1950	1964	1973	1980
All Guatemala	1.71	1.11	.92	.79
Chimaltenango	.42	.32	.26	.22
El Progreso	.28	.21	.19	.17
Guatemala	.07	.04	.03	.02
Sacatepequez	.05	.04	.03	.02
Escuintla	3.07	1.41	1.38	1.14
Santa Rosa	.88	.62	.54	.48
Huehuetenango	.69	.48	.38	.32
Quetzaltenango	.33	.23	.20	.17
Retalhuleo	2.30	1.31	1.24	1.03
San Marcos	.33	.23	.20	.16
Solola	.09	.07	.06	.05
Suchitepequez	1.74	1.16	1.07	.91
Totonicapan	.20	.14	.12	.10
Alta Verapaz	1.19	.86	.80	.70
Baja Verapaz	.33	.23	.21	.19
Izabal	6.35	3.00	2.06	1.80
El Peten	154.03	92.09	36.50	18.66
El Quiche	1.04	.73	.60	.56
Chiquimula	.63	.47	.44	.42
Jalapa	.50	.38	.31	.28
Jutiapa	1.04	.74	.62	.58
Zacapa	.51	.37	.34	.31

*Calculated from TABLES 5 and 9 of this Study. See Annex B.

TABLE 4 LAND TENANCY IN GUATEMALA: 1950, 1979*
(Expressed in Percentages of Surface Area)

Size	Owned		Rented		Other forms	
	1950	1979	1950	1979	1950	1979
LT .7 hectares	43.9	74.4	23.5	8.3	32.6	17.3
.7 to LT .4 hect.	38.1	66.3	28.8	8.0	33.0	25.7
1.4 to LT 3.5 hect.	50.9	70.6	21.4	5.6	27.7	23.8
3.5 to LT .7 hect.	71.3	76.3	10.1	3.1	18.6	20.6
7 to LT 22.4 hect.	85.3	84.3	4.9	2.1	9.8	13.6
22.4 to LT 44.8 hect.	87.6	86.3	4.5	0.9	7.9	12.8
44.8 to LT 450 hect.	96.3	94.1	2.0	1.7	1.7	4.2
450 to LT 900 hect.	97.3	95.0	1.6	2.6	1.0	5.5
900 to LT 2,250 hect.	99.0	91.1	0.7	3.4	0.3	3.7
2,250 to LT 4,500 hect.	98.4	96.3	0.3	0.0	1.3	7.9
4,500 to LT 9,000 hect.	99.4	92.1	0.0	8.0	0.4	2.4
9,000 hect. and larger	99.9	100.0	0.1	0.0	0.0	0.0
National Percentages	90.4	88.8	4.0	2.6	5.6	8.6

* The census of 1950 eliminated all farms of less than .04 hectare (i.e., una cuerda), whereas the 1964 census established no lower limit. The 1979 census recorded all farms irrespective of size, but at the time of the compilation of this study the farms of less than .04 hectare had not yet been processed. It is understood that there are approximately 70,000 farms of this size for an estimated maximum total of 3,043 hectares of land. "Other forms" refer to land which is held communally, in colono status (i.e., land for which usufruct rights are given by the owner to mozos, i.e., permanent estate workers) or some combination of owned, rented, communal and colono.

Sources: 1950 and 1964 data, Direccion General de Estadistica, Censo agropecuario 1964, Tomo I, Guatemala, 1968. 1979 data, unpublished preliminary tabulations from Direccion General de Estadistica " III Censo Nacional agropecuario, Abril, 1979. Plan Basico de Tabulaciones." Agosto, 1982.

Table 5. POPULATION: DISTRIBUTION BY DEPARTMENT, 1950, 1964, 1973, 1980

Department	Year 1950 Population	%	1964 Population	%	1973 Population	%	1980 Population	%
CHIMALTENANGO	121,480	4.4	163,153	3.8	197,780	3.8	230,724	3.8
EL PROGRESO	47,872	1.7	65,582	1.5	72,840	1.4	81,121	1.3
GUATEMALA	438,913	15.7	810,858	18.9	1,114,120	21.5	1,307,340	21.6
SACATEPEQUEZ	60,124	2.2	80,942	1.9	99,160	1.9	120,060	2.0
ESCUINTLA	123,759	4.4	270,267	6.3	275,600	5.3	332,551	5.5
SANTA ROSA	109,836	3.9	157,040	3.7	179,540	3.5	200,845	3.3
HUEHUETENANGO	200,101	7.2	288,088	6.7	363,380	7.0	429,460	7.1
QUEZALTENANGO	184,213	6.6	270,916	6.3	308,880	6.0	364,641	6.0
RETALHULEU	66,861	2.4	117,562	2.7	124,580	2.4	150,105	2.5
SAN MARCOS	232,591	8.3	336,959	7.9	391,360	7.6	470,985	7.8
SOLOLA	82,921	3.0	107,822	2.5	128,120	2.5	153,874	2.5
SUCHITEPEQUEZ	124,403	4.5	186,634	4.4	202,540	3.9	237,472	3.9
TOTONICAPAN	99,354	3.6	141,772	3.3	168,700	3.3	203,545	3.4
ALTA VERAPAZ	189,812	6.8	260,498	6.1	279,880	5.4	322,132	5.3
BAJA VERAPAZ	66,313	2.4	96,485	2.3	106,440	2.1	115,206	1.9
IZABAL	55,032	2.0	116,685	2.7	169,960	3.3	193,972	3.2
EL PETEN	15,880	0.6	26,562	0.6	67,020	1.3	131,084	2.2
EL QUICHE	174,911	6.3	249,939	5.8	303,880	5.9	326,188	5.4
CHIQUIMULA	112,841	4.0	149,752	3.5	161,980	3.1	169,428	2.8
JALAPA	75,190	2.7	99,153	2.3	119,960	2.3	135,366	2.2
JUTIAPA	138,925	5.0	194,774	4.5	234,580	4.5	251,642	4.2
ZACAPA	69,536	2.5	96,554	2.3	105,100	2.0	115,818	1.9
TOTAL	2,790,868	100.0	4,287,997	100.0	5,175,400	100.0	6,043,559	100.0

Source: Direccion General de Estadistica, VII Censos de Poblacion, 1964, Tomo I, Guatemala: Ministerio de Economia, 1971, pp.47: Direccion General de Estadistica, VIII Censos de Poblacion, Serie III, Tomo I, Guatemala: Ministerio de Economia, 1975, pp.5-23, and unpublished preliminary tabulations, 1980 population census, Direccion General de Estadistica.

TABLE 6. ECONOMICALLY ACTIVE POPULATION 10 YEARS AND OLDER BY DEPARTMENT: 1973

DEPARTMENT	ECONOMICALLY ACTIVE POPULATION	ECONOMICALLY ACTIVE POPULATION IN AGRICULTURE	PERCENT OF EAP IN AG, 1973	NUMBER OF AG LABORERS	AG LABORERS AS PERCENT OF EAP
CHIMALTENANGO	55,058	41,888	76.07	21,434	51.16
EL PROGRESO	19,066	13,912	72.96	5,912	42.49
GUATEMALA	375,568	44,423	11.82	23,255	52.34
SACATEPEQUEZ	30,900	17,552	56.80	9,399	53.54
ESCUINTLA	84,127	51,362	61.05	35,978	70.04
SANTA ROSA	49,839	38,180	76.60	21,989	57.59
HUEHUETENANGO	106,505	85,565	80.33	35,780	41.81
QUEZALTENANGO	90,790	54,045	59.52	30,574	56.57
RETALHULEU	37,050	25,007	67.49	14,054	56.20
SAN MARCOS	112,333	93,017	82.80	47,917	51.51
SOLOLA	39,009	28,919	74.13	13,922	48.14
SUCHITEPEQUEZ	61,013	41,710	68.36	29,515	70.76
TOTONICAPAN	47,311	16,102	34.03	7,849	48.74
ALTA VERAPAZ	82,887	63,823	77.00	37,787	59.20
BAJA VERAPAZ	30,759	24,376	79.24	10,644	43.66
IZABAL	48,454	33,953	70.07	11,877	34.98
EL PETEN	19,078	14,406	75.51	4,409	30.60
EL QUICHE	81,689	59,809	73.21	27,370	45.76
CHIQUIMULA	47,273	33,223	70.27	13,885	41.79
JALAPA	32,625	25,555	78.32	9,044	35.39
JUTIAPA	63,951	49,796	77.86	19,022	38.19
ZACAPA	30,373	19,287	63.50	8,339	43.23
	1,545,658	875,910		439,955	

Source: Data from unpublished tabulations, "cuadro 39" for the VII Censo de Poblacion, 1973.

TABLE 7. ESTIMATE OF LANDLESS POPULATION, 1980

Economically active population in agriculture 10 years and older who are in subgroup of "trabajadores agricolas" (1973 census).	439,955
Percent of economically active population in agriculture who are age 10 thru 19 inclusive.	X .176
Number of economically active people in agriculture who are age 10 thru 19	-77,432
Economically Active Agricultural Workers in 1973	362,523
Total Population in 1980 census	6,043,559
Total Population 1973 census	-5,175,400
Intercensal Population growth 1973-1980	868,159
Landless Population in 1973	362,523
Growth Factor	x.1575*
Growth of Economically Active Agricultural population	57,097
Landless Population 1973	+362,523
ESTIMATED LANDLESS POPULATION 1980	419,620
Colonos with land 1979	-62,977
Landless colonos 1979	-47,524
TOTAL LANDLESS AGRICULTURAL WORKERS, 1980 AGE 20 AND OVER NOT EMPLOYED PERMANENTLY	309,119

* Estimated intercensal growth in the agricultural sector is calculated by projecting the decline in the proportion of the agricultural population based upon the 1964-1973 intercensal period. During those years the agricultural population declined by 7.8 per cent as a proportion of the total population. At the same rate of decline, the agricultural sector would have shrunk by 6.1 per cent, in the 1973-1980 period. By this calculation the agricultural sector would amount to 51.9 per cent of the total population. Population growth, 1973-1980 equals 16.77 per cent of the total population of which 15.75 (16.77% x 6.1% = 1.02%; 16.77 - 1.02 = 15.75%) is the estimated percent growth of agricultural population, 1973-1980.

TABLE 8A - LAND USE POTENTIAL

CLASSIFICATION		DESCRIPTION
Bovay	INAFOR[1]	
A	I	Agricultural lands suitable for intensive cultivation, with little or not limitation; areas with slopes of less than 4%. Suitable for irrigation.
B	II	Lands suitable for intensive cultivation with little limitation; areas with slopes of less than 8%. Limitations imposed by the need to take precautions against erosion. Suitable for irrigation.
C	III IV	Lands requiring feasibility studies to determine whether they may most suitably be used for agriculture (perennial crops), pasture or foresty. Severe limitations imposed by the need to take precautions against erosion. Irrigation possibility limited.
D	V	Lands mostly adapted to forestry, varying in topography from steeply sloping to severely dissected. Soils shallow and seriously subject to erosion. Small pockets of soil suitable for agriculture may be found in valleys and depressions but must be handled with extreme precautions against erosion.
E	VI	Land limited to forestry by extremely broken topography, thin and eroded soils. Mostly deciduous.
F	VII	Swampy and flooded lands under water a good portion of the year.
G[2]	VIII	Forests located on extremely broken topography with thin and eroded soils which must be preserved to protect watersheds and to avoid the destruction of soil and water resources and to protect fragile ecosystems.

1 Instituto Nacional Forestal
2 Includes wetlands.

TABLE 8.B.
DESCRIPTION OF LAND USE POTENTIAL BY DEPARTMENT
(IN 000'S OF HECTARES)

DEPARTMENT	DEPT. TOTAL AREA	FIRST CLASS LAND	SECOND CLASS LAND	MULTIPLE USE LAND	FOREST LAND	RESERVE LAND	SWAMP LAND	KARST FOREST LAND
CHIMALTENANGO	197.9	19.8	31.8		119.3	27.0		
EL PROGRESO	192.2	13.5			148.4	30.3		
GUATEMALA	211.1	15.1	17.1		174.8	4.1		
SACATEPEQUEZ	46.5	2.9			26.8	16.8		
ESCUINTLA	438.4	192.1	188.2		3.0	35.5	19.6	
SANTA ROSA	295.5	52.2	44.8		151.9	26.0	20.6	
HUEHUETENANGO	740.0	9.9		128.4	292.5	141.8	2.7	164.7
QUEZALTENANGO	195.1	15.9	45.5		101.4	29.3	3.0	
RETALHULEU	185.6	71.3	82.7		11.8		19.8	
SAN MARCOS	379.1	20.0	56.6		194.1	99.4	9.0	
SOLOLA	93.1	2.2	4.9		42.6	43.4		
SUCHITEPEQUEZ	251.0	48.9	167.6		25.2	6.6	2.7	
TOTONICAPAN	106.1	2.8	17.5		84.7	1.1		
ALTA VERAPAZ	868.6	57.3		167.8	111.1	122.2		410.2
BAJA VERAPAZ	312.4	21.9			244.9	45.6		
IZABAL	838.6	214.5		135.2	249.0	98.0	73.2	68.7
EL PETEN	3,585.4	19.5		617.4	1,657.2	152.0	101.7	1,037.7
EL QUICHE	837.8	73.1		108.8	278.3	233.0		144.6
CHIQUIMULA	237.6	16.3	54.5		130.0	36.8		
JALAPA	206.3	3.6	33.9		155.6	13.2		
JUTIAPA	321.9	36.8	108.1		161.7	5.1	10.2	
ZACAPA	269.0	35.8			166.6	66.6		
TOTAL	10,809.2	945.4	853.2	1,157.6	4,530.9	1,233.8	262.5	1,825.9

TABLE 8C. TOTAL LAND AVAILABLE AND FIRST CLASS EQUIVALENTS,
FRANJA TRANSVERSAL DEL NORTE AND EL PETEN

	ACTUAL HECTARES					FIRST CLASS EQUIVALENT[2]			
CLASS	FTN[1]	PETEN	TOTAL	PERCENT	CONVERS. FACTOR	FTN	PETEN	TOTAL	PERCENT
A	442.00	195.00	637.00	1.44		442.00	195.00	637.00	2.78
B	92.50		92.50	0.21	.65	60.13		60.13	.26
C	3,147.50	24,265.00	27,412.50	61.77	.65	2,045.88	15,772.00	17,817.88	77.92
D	263.00		263.00	0.59	.40	105.20		105.20	0.46
E	339.00		339.00	0.76	.20	67.80		67.80	2.38
F	70.00	1,017.00	1,087.00	2.45	.50	35.00	509.00	544.00	2.38
G	4,169.00	10,377.00	14,546.00	32.79	.25	1,042.25	2,594.00	3,636.25	15.90
TOTAL	8,523.00	35,854.00	44,377.00	100.00		3,798.26	19,070.00	22,868.26	100.00

1) Perdomo, 1975
2) To convert land area to First Class Equivalent, Bovay Report, 1975

TABLE 9.
LAND USE AND LAND POTENTIAL BY DEPARTMENT
(IN 000'S OF HECTARES)

DEPARTMENT	TOTAL AREA IN DEPARTMENT	AREA MINUS FOREST	TOTAL AREA IN FARMS	CULTIVATED LAND	ARABLE OPTION 1	ARABLE OPTION 2	ARABLE OPTION 3
CHIMALTENANGO	197.9	51.6	109.9	66.8	51.6	51.6	51.6
EL PROGRESO	192.2	13.5	68.9	39.8	13.5	13.5	13.5
GUATEMALA	211.1	32.2	120.6	77.2	32.2	32.2	32.2
SACATEPEQUEZ	46.5	2.9	24.5	18.0	2.9	2.9	2.9
ESCUINTLA	438.4	399.9	481.5	418.3	380.3	380.3	399.9
SANTA ROSA	295.5	117.6	240.0	191.1	97.0	97.0	117.6
HUEHUETENANGO	740.0	305.7	223.5	145.8	138.3	303.0	305.7
QUEZALTENANGO	195.1	64.4	134.6	111.6	61.4	61.4	64.4
RETALHULEU	185.6	173.8	131.2	119.1	154.0	154.0	173.8
SAN MARCOS	379.1	85.6	196.4	160.0	76.6	76.6	85.6
SOLOLA	93.1	7.1	30.1	20.9	7.1	7.1	7.1
SUCHITEPEQUEZ	251.0	219.2	231.5	208.1	216.5	216.5	219.2
TOTONICAPAN	106.1	20.3	28.6	14.5	20.3	20.3	20.3
ALTA VERAPAZ	868.6	635.3	443.6	261.7	225.1	635.3	635.3
BAJA VERAPAZ	312.4	21.9	128.6	77.7	21.9	21.9	21.9
IZABAL	838.6	491.6	283.3	201.0	349.7	418.4	491.6
EL PETEN	3,585.4	1,776.2	562.0	269.1	636.9	1,674.6	1,776.3
EL QUICHE	837.8	326.5	240.2	113.8	181.9	326.5	326.5
CHIQUIMULA	237.6	70.8	81.1	69.0	70.8	70.8	70.8
JALAPA	206.3	37.5	103.2	79.5	37.5	37.5	37.5
JUTIAPA	321.9	155.1	191.1	162.4	144.9	144.9	155.1
ZACAPA	269.0	35.8	121.6	74.1	35.8	35.8	35.8
TOTAL	10,809.2	5,044.5	4,176.0	2,899.5	2,956.2	4,782.1	5,044.6

TABLE 10.
LAND AVAILABLE FOR DISTRIBUTION BY DEPARTMENT
(IN FIRST CLASS EQUIVALENT UNITS)

DEPARTMENT	PUBLIC DOMAIN: OPTION 1	IDLE LAND: OPTION 1	PUBLIC DOMAIN: OPTION 2	IDLE LAND: OPTION 2	PUBLIC DOMAIN: OPTION 3	IDLE LAND: OPTION 3
CHIMALTENANGO						
EL PROGRESO						
GUATEMALA						
SACATEPEQUEZ						
ESCUINTLA						
SANTA ROSA						
HUEHUETENANGO			19,869.0	13,854.3	21,219.0	14,077.8
QUEZALTENANGO						
RETALHULEU	14,849.1		14,849.1		24,749.1	
SAN MARCOS						
SOLOLA						
SUCHITEPEQUEZ						
TOTONICAPAN		7,290.6		7,290.6		7,290.6
ALTA VERAPAZ			47,932.0	34,372.2	47,932.0	34,372.2
BAJA VERAPAZ						
IZABAL	43,142.7	35,109.6	60,317.7	27,259.7	96,917.7	27,189.3
EL PETEN	48,675.1	153,839.4	308,100.1	81,029.5	358,950.1	83,644.5
EL QUICHE		66,559.9	21,573.7	35,171.6	21,573.7	35,171.6
CHIQUIMULA						
JALAPA						
JUTIAPA						
ZACAPA						
TOTAL	106,667.0	262,799.5	472,641.7	198,978.0	571,341.7	201,746.0

TABLE 11.A
LAND AND LANDLESS LABORERS BY DEPARTMENT
OPTION 1: TYPE A+B+C LAND ARABLE
(IN FIRST CLASS EQUIVALENT UNITS)

DEPARTMENT	LAND AVAILABLE FOR DISTRIBUTION	LAND NEEDED FOR LANDLESS LABORERS	NUMBER OF LANDLESS LABORERS	NUMBER OF LABORERS CAN BE ABSORBED	NET BALANCE OF LAND FOR DISTRIBUTION	NET BALANCE OF LABOR
CHIMALTENANGO		55,852	14,321		55,852-	14,321
EL PROGRESO		21,450	5,500		21,450-	5,500
GUATEMALA		72,634	18,624		72,634-	18,624
SACATEPEQUEZ		24,098	6,179		24,098-	6,179
ESCUINTLA		74,779	19,174		74,779-	19,174
SANTA ROSA		51,737	13,266		51,737-	13,266
HUEHUETENANGO		126,247	32,371		126,247-	32,371
QUEZALTENANGO		69,358	17,784		69,358-	17,784
RETALHULEU	14,849	31,391	8,049	3,807	16,542-	4,242
SAN MARCOS		121,376	31,122		121,376-	31,122
SOLOLA		47,923	12,288		47,923-	12,288
SUCHITEPEQUEZ		52,783	13,534		52,783-	13,534
TOTONICAPAN	7,291	28,860	7,400	1,869	21,569-	5,531
ALTA VERAPAZ		85,114	21,824		85,114-	21,824
BAJA VERAPAZ		31,793	8,152		31,793-	8,152
IZABAL	78,253	35,283	9,047	20,065	42,970	11,018-
EL PETEN	202,514	13,354	3,424	51,927	189,160	48,503-
EL QUICHE	66,560	92,383	23,688	17,067	25,823-	6,621
CHIQUIMULA		50,665	12,991		50,665-	12,991
JALAPA		31,613	8,106		31,613-	8,106
JUTIAPA		62,330	15,982		62,330-	15,982
ZACAPA		24,543	6,293		24,543-	6,293
TOTAL	369,467	1,205,566	309,119	94,735	836,009-	-214,384

TABLE 11.B
LAND AND LANDLESS LABORERS BY DEPARTMENT
OPTION 2. INCLUDE KARST FOREST AS ARABLE
(IN FIRST CLASS EQUIVALENT UNITS)

DEPARTMENT	LAND AVAILABLE FOR DISTRIBUTION	LAND NEEDED FOR LANDLESS LABORERS	NUMBER OF LANDLESS LABORERS	NUMBER OF LABORERS CAN BE ABSORBED	NET BALANCE OF LAND FOR DISTRIBUTION	NET BALANCE OF LABOR
CHIMALTENANGO		55,852	14,321		55,852-	14,321
EL PROGRESO		21,450	5,500		21,450-	5,500
GUATEMALA		72,634	18,624		72,634-	18,624
SACATEPEQUEZ		24,098	6,179		24,098-	6,179
ESCUINTLA		74,779	19,174		74,779-	19,174
SANTA ROSA		51,737	13,266		51,737-	13,266
HUEHUETENANGO	33,723	126,247	32,371	8,647	92,524-	23,724
QUEZALTENANGO		69,358	17,784		69,358-	17,784
RETALHULEU	14,849	31,391	8,049	3,807	16,542-	4,242
SAN MARCOS		121,376	31,122		121,376-	31,122
SOLOLA		47,923	12,288		47,923-	12,288
SUCHITEPEQUEZ		52,783	13,534		52,783-	13,534
TOTONICAPAN	7,291	28,860	7,400	1,869	21,569-	5,531
ALTA VERAPAZ	82,304	85,114	21,824	21,104	2,810-	720
BAJA VERAPAZ		31,793	8,152		31,793-	8,152
IZABAL	87,578	35,283	9,047	22,456	52,295	13,409-
EL PETEN	389,130	13,354	3,424	99,777	375,776	96,353-
EL QUICHE	56,746	92,383	23,688	14,550	35,637-	9,138
CHIQUIMULA		50,665	12,991		50,665-	12,991
JALAPA		31,613	8,106		31,613-	8,106
JUTIAPA		62,330	15,982		62,330-	15,982
ZACAPA		24,543	6,293		24,543-	6,293
TOTAL	671,621	1,205,566	309,119	172,210	533,945-	136,909

TABLE 11.C
LAND AND LANDLESS LABORERS BY DEPARTMENT
OPTION 3: INCLUDE SWAMP LAND AS ARABLE
(IN FIRST CLASS EQUIVALENT UNITS)

DEPARTMENT	LAND AVAILABLE FOR DISTRIBUTION	LAND NEEDED FOR LANDLESS LABORERS	NUMBER OF LANDLESS LABORERS	NUMBER OF LABORERS CAN BE ABSORBED	NET BALANCE OF LAND FOR DISTRIBUTION	NET BALANCE OF LABOR
CHIMALTENANGO		55,852	14,321		55,852-	14,321
EL PROGRESO		21,450	5,500		21,450-	5,500
GUATEMALA		72,634	18,624		72,634-	18,624
SACATEPEQUEZ		24,098	6,179		24,098-	6,179
ESCUINTLA		74,779	19,174		74,779-	19,174
SANTA ROSA		51,737	13,266		51,737-	13,266
HUEHUETENANGO	35,297	126,247	32,371	9,051	90,950-	23,320
QUEZALTENANGO		69,358	17,784		69,358-	17,784
RETALHULEU	24,749	31,391	8,049	6,346	6,642-	1,703
SAN MARCOS		121,376	31,122		121,376-	31,122
SOLOLA		47,923	12,288		47,923-	12,288
SUCHITEPEQUEZ		52,783	13,534		2,783-	13,534
TOTONICAPAN	7,291	28,860	7,400	1,869	1,569-	5,531
ALTA VERAPAZ	82,304	85,114	21,824	21,104	2,810-	720
BAJA VERAPAZ		31,793	8,152		31,793-	8,152
IZABAL	124,107	35,283	9,047	31,822	88,824	22,775-
EL PETEN	442,595	13,354	3,424	113,486	429,241	110,062-
EL QUICHE	56,746	92,383	23,688	14,550	35,637-	9,138
CHIQUIMULA		50,665	12,991		50,665-	12,991
JALAPA		31,613	8,106		31,613-	8,106
JUTIAPA		62,330	15,982		62,330-	15,982
ZACAPA		24,543	6,293		24,543-	6,293
TOTAL	773,089	1,205,566	309,119	198,228	432,477-	110,891

TABLE 11.D
LAND AND LANDLESS LABORERS BY DEPARTMENT
OPTION 1: TYPE A+B+C LAND ARABLE
(IN FIRST CLASS EQUIVALENT UNITS)

DEPARTMENT	LAND AVAILABLE FOR DISTRIBUTION	LAND NEEDED FOR LANDLESS LABORERS	NUMBER OF AG LABORERS	NUMBER OF LABORERS CAN BE ABSORBED	NET BALANCE OF LAND FOR DISTRIBUTION	NET BALANCE OF LABOR
CHIMALTENANGO		79,728	20,443		79,728-	20,443
EL PROGRESO		21,992	5,639		21,992-	5,639
GUATEMALA		86,502	22,180		86,502-	22,180
SACATEPEQUEZ		34,964	8,965		34,964-	8,965
ESCUINTLA		133,829	34,315		133,829-	34,315
SANTA ROSA		81,795	20,973		81,795-	20,973
HUEHUETENANGO		133,091	34,126		133,091-	34,126
QUEZALTENANGO		113,728	29,161		113,728-	29,161
RETALHULEU	14,849	52,276	13,404	3,807	7,427-	9,597
SAN MARCOS		178,238	45,702		178,238-	45,702
SOLOLA		51,788	13,279		51,788-	13,279
SUCHITEPEQUEZ		109,789	28,151		109,789-	28,151
TOTONICAPAN	7,291	29,195	7,486	1,869	21,904-	5,617
ALTA VERAPAZ		140,556	36,040		140,556-	36,040
BAJA VERAPAZ		39,593	10,152		39,593-	10,152
IZABAL	78,253	44,179	11,328	20,065	34,074	8,737-
EL PETEN	202,514	16,400	4,205	51,927	186,114	47,722-
EL QUICHE	66,560	101,810	26,105	17,067	35,250-	9,038
CHIQUIMULA		51,648	13,243		51,648-	13,243
JALAPA		33,641	8,626		33,641-	8,626
JUTIAPA		70,758	18,143		70,758-	18,143
ZACAPA		31,021	7,954		31,021-	7,954
TOTAL	369,467	1,636,521	419,620	94,735	1,267,054-	324,885

TABLE 11.E
LAND AND LANDLESS LABOR BY DEPARTMENT
OPTION 2: INCLUDE KARST FOREST AS ARABLE
(IN FIRST CLASS EQUIVALENT UNITS)

DEPARTMENT	LAND AVAILABLE FOR DISTRIBUTION	LAND NEEDED FOR LANDLESS LABORERS	NUMBER OF AG LABORERS	NUMBER OF LABORERS CAN BE ABSORBED	NET BALANCE OF LAND FOR DISTRIBUTION	NET BALANCE OF LABOR
CHIMALTENANGO		79,728	20,443		79,728-	20,443
EL PROGRESO		21,992	5,639		21,992-	5,639
GUATEMALA		86,502	22,180		86,502-	22,180
SACATEPEQUEZ		34,964	8,965		34,964-	8,965
ESCUINTLA		133,829	34,315		133,829-	34,315
SANTA ROSA		81,795	20,973		81,795-	20,973
HUEHUETENANGO	33,723	133,091	34,126	8,647	99,368-	25,479
QUEZALTENANGO		113,728	29,161		113,728-	29,161
RETALHULEU	14,849	52,276	13,404	3,807	37,427-	9,597
SAN MARCOS		178,238	45,702		178,238-	45,702
SOLOLA		51,788	13,279		51,788-	13,279
SUCHITEPEQUEZ		109,789	28,151		109,789-	28,151
TOTONICAPAN	7,291	29,195	7,486	1,869	21,904-	5,617
ALTA VERAPAZ	82,304	140,556	36,040	21,104	58,252-	14,936
BAJA VERAPAZ		39,593	10,152		39,593-	10,152
IZABAL	87,578	44,179	11,328	22,456	43,399	11,128-
EL PETEN	389,130	16,400	4,205	99,777	372,730	95,572-
EL QUICHE	56,746	101,810	26,105	14,550	45,064-	11,555
CHIQUIMULA		51,648	13,243		51,648-	13,243
JALAPA		33,641	8,626		33,641-	8,626
JUTIAPA		70,758	18,143		70,758-	18,143
ZACAPA		31,021	7,954		31,021-	7,954
TOTAL	671,621	1,636,521	419,620	172,210	964,900-	247,410

TABLE 11.F
LAND AND LANDLESS LABOR BY DEPARTMENT
OPTION 3: INCLUDE SWAMP LAND AS ARABLE
(IN FIRST CLASS EQUIVALENT UNITS)

DEPARTMENT	LAND AVAILABLE FOR DISTRIBUTION	LAND NEEDED FOR LANDLESS LABORERS	NUMBER OF AG. LABORERS	NUMBER OF LABORERS CAN BE ABSORBED	NET BALANCE OF LAND FOR DISTRIBUTION	NET BALANCE OF LABOR
CHIMALTENANGO		79,728	20,443		79,728-	20,443
EL PROGRESO		21,992	5,639		21,992-	5,639
GUATEMALA		86,502	22,180		86,502-	22,180
SACATEPEQUEZ		34,964	8,965		34,964-	8,965
ESCUINTLA		133,829	34,315		133,829-	34,315
SANTA ROSA		81,795	20,973		1,795-	20,973
HUEHUETENANGO	35,297	133,091	34,126	9,051	7,794-	25,075
QUEZALTENANGO		113,728	29,161		13,728-	29,161
RETALHULEU	24,749	52,276	13,404	6,346	27,527-	7,058
SAN MARCOS		178,238	45,702		78,238-	45,702
SOLOLA		51,788	13,279		1,788-	13,279
SUCHITEPEQUEZ		109,789	28,151		09,789-	28,151
TOTONICAPAN	7,291	29,195	7,486	1,869	1,904-	5,617
ALTA VERAPAZ	82,304	140,556	36,040	21,104	8,252-	14,936
BAJA VERAPAZ		39,593	10,152		39,593-	10,152
IZABAL	124,107	44,179	11,328	31,822	9,928	20,494-
EL PETEN	442,595	16,400	4,205	113,486	26,195	9,281-
EL QUICHE	56,746	101,810	26,105	14,550	45,064-	11,555
CHIQUIMULA		51,648	13,243		51,648-	13,243
JALAPA		33,641	8,626		33,641-	8,626
JUTIAPA		70,758	18,143		70,758-	18,143
ZACAPA		31,021	7,954		31,021-	7,954
TOTAL	773,089	1,636,521	419,620	198,228	863,432-	221,392

TABLE 12. MIGRATION FROM PLACE OF BIRTH TO PLACE OF RESIDENCE 1973
LADINO AND INDIAN POPULATION*

Department	OUT MIGRATION		IN MIGRATION		NET MIGRATION	
	Ladino	Indian	Ladino	Indian	Ladino	Indian
Guatemala	52,484	6,860	273,805	31,672	+221,321	+24,812
El Progreso	31,560	995	8,968	208	-22,592	-787
Sacatepequez	17,461	3,838	8,953	2,738	-8,508	-1,100
Chimaltenango	22,898	10,456	7,842	5,204	-15,056	-5,252
Esquintla	47,449	3,136	86,276	12,573	+38,827	+9,437
Santa Rosa	60,256	2,022	18,913	2,246	-41,343	+224
Solola	5,095	4,085	1,927	2,744	-3,168	-1,341
Totonicapan	5,638	9,881	1,353	1,868	-4,285	-8,013
Quetzaltenango	38,781	10,271	20,634	9,076	-18,147	-1,195
Suchitepequez	31,405	6,921	24,319	11,117	-7,086	+4,196
Retalhuleu	17,007	3,601	28,032	6,453	+11,025	+2,852
San Marcos	36,440	7,417	8,925	3,954	-27,515	-3,463
Huehuetenango	19,329	9,258	4,743	2,737	-14,586	-6,521
El Quiche	17,574	11,576	4,325	3,777	-13,249	-7,799
Baja Verapaz	17,264	5,785	3,625	1,470	-13,639	-4,315
Alta Verapaz	11,308	18,689	6,183	3,745	-5,125	-14,944
El Peten	2,451	217	24,652	7,745	+22,201	+7,528
Izabal	16,399	923	66,399	13,713	+50,000	+12,790
Zacapa	41,837	2,194	10,764	602	-31,073	-1,592
Chiquimula	43,107	3,954	6,049	650	-37,058	-3,304
Jalapa	33,025	2,308	6,956	849	-26,069	-1,459
Jutiapa	62,217	1,696	11,779	942	-50,438	-754

* The total numbers of in-migrations and out-migrations are not equal. This results from inaccuracies within the original source data.

Source: Direccion General de Estadistica, VIII Censo de Poblacion, 1973, Serie III, Tomo I, Cifras Definitivas: Guatemala: Ministerio de Economia, 1975.

TABLE 13. MIGRATION 1968-1973 BY DEPARTMENT
(POPULATION OVER AGE 5 IN 1973)
LADINO AND INDIAN POPULATION*

Department	OUT MIGRATION		IN MIGRATION		NET MIGRATION		Percentage of 1968 POP.	
	Ladino	Indian	Ladino	Indian	Ladino	Indian	Ladino	Indian
Guatemala	20,599	3,060	59,156	9,704	+38,557	+6,644	+5.0%	+5.4%
El Progreso	6,581	272	2,539	56	-4,042	-216	-6.3%	-21.9%
Sacatepequez	2,698	1,013	3,030	781	+332	-232	+.8%	-.6%
Chimaltenango	3,995	3,110	2,753	1,487	-1,242	-1,632	-3.5%	-1.3%
Escuintla	18,833	1,876	18,681	4,220	-152	+2,344	-.1%	+10.8%
Santa Rosa	13,459	726	5,887	1,526	-7,572	+800	-5.2%	+9.6%
Solola	1,105	992	739	1,164	-366	+172	-5.9%	+.2%
Totonicapan	1,074	2,256	608	735	-466	-1,521	-8.1%	-1.1%
Quetzaltenango	9,573	2,780	13,130	2,477	+3,557	-303	+3.5%	-.2%
Suchitepequez	9,299	2,616	6,726	2,853	-2,573	+273	-3.4%	+.3%
Retalhuleu	6,257	1,272	5,547	1,126	-710	-146	-1.0%	-.4%
San Marcos	10,186	2,620	3,036	1,475	-7,150	-1,145	-5.3%	-.6%
Huehuetenango	3,883	4,176	174	1,000	-3,709	-3,176	-3.9%	-1.5%
El Quiche	3,406	2,929	1,585	1,887	-1,821	-1,042	-4.9%	-.5%
Baja Verapaz	3,907	2,053	1,471	293	-2,436	-1,760	-6.1%	-3.4%
Alta Verapaz	2,352	4,002	2,629	1,503	+277	-2,499	+1.4%	-1.2%
El Peten	1,417	155	15,243	2,120	+13,826	+1,965	+57.2%	+17.0%
Izabal	8,285	465	13,818	4,358	+5,533	+3,893	+5.4%	+18.2%
Zacapa	9,958	763	3,729	365	-6,229	-398	-6.7%	-18.0%
Chiquimula	10,655	1,497	2,594	265	-8,061	-1,232	-8.9%	-2.5%
Jalapa	7,506	1,003	2,564	378	-4,942	-625	-8.0%	-1.6%
Jutiapa	15,531	805	5,293	693	-10,238	-112	-5.4%	1.0%

* The total numbers of in-migrations and out-migrations are not equal. This results from inaccuracies within the original source data.

Source: Direccion General de Estadistica, VIII Censo de Poblacion, 1973, Serie III, Tomo I, Cifras Definitivas: Guatemala: Ministerio de Economia, 1975.

D UNDER DECREE 900, 1953-1954, BY DEPARTMENT*

Department	Number	Total Area of farms (hectares)	Total Value value (Quetzales)	Area expropiated (hectares)	Value of Indemnization (Quetzales)
Guatemala	133	58,608	1,571,127	24,402	606,891
El Progreso	12	15,869	162,432	10,866	105,366
Sacatepequez	24	12,008	741,495	4,397	294,388
Chimaltenango	107	42,289	1,402,013	21,270	510,001
Esquintla	139	296,463	6,332,616	151,707	2,384,143
Santa Rosa	74	66,458	1,418,485	27,252	544,989
Solola	13	4,514	272,918	1,442	83,874
Quetzaltenango	30	23,315	1,134,223	6,561	284,858
Suchitepequez	61	63,127	3,121,237	30,706	1,157,811
Retalhuleu	22	30,418	611,570	14,348	190,658
San Marcos	63	27,156	1,328,655	9,614	426,947
Huehuetenango	42	49,874	122,521	34,944	81,987
El Quiche	65	64,774	331,156	53,299	227,042
Baja Verapaz	45	28,810	120,969	16,466	59,042
Alta Verapaz	87	130,749	908,130	95,286	596,131
Izabal	14	134,417	1,157,540	82,767	638,786
Zacapa	12	7,762	125,455	1,830	28,141
Chiquimula	4	2,128	25,059	731	9,375
Jalapa	15	8,651	93,287	3,151	28,430
Jutiapa	40	23,683	160,104	12,575	86,674
TOTAL	1,002	1,091,073	Q21,140,972	603,615	Q8,345,544

Source: Oficina de Registro y Estadistica del Departamento Agrario Nacional, as reported in Comite Interamericano de Desarrollo Agricola, Tenencia de la Tierra y Desarrollo Socio-Economico del Sector Agricola: Guatemala. Union Panamericana: Washington, D.C. 1965, p.41. This publication is also available in English.

* Somewhat different figures are reported by Jose Louis Paredes Moreira, Estudios Sobre Tenencia de la Tierra en Guatemala: Aplicacion del decreto 900, sobre la reforma agraria. Guatemala: Instituto de Investigaciones Economicas y Sociales, Facultad de Ciencias Economicas, Universidad de San Carlos de Guatemala, 1964, pp.50, 72, 78. According to this source, which bases its information on the "Acuerdos de Expropriacion," a total of 1,012 expropriations were declared rather than the 1002 reported above. The total amount of land expropriated according to Paredes Moreira was 866,344 manzanas, or 593,386 hectares, and the total indemnization paid was 8,304,732 quetzales. No apparent systematic differences appear in the data which would explain this inconsistency. Unfortunately, other sources report figures which are at variance with these two sources (Direccion General de Asuntos Agrarios, "Problemas Relacionados con el Uso y la Tenencia de la Tierra," Guatemala, 1957; and same author, Datos Sobre Realizaciones del Programa Agrario en Guatemala," Guatemala, 1961). Since it is reported that much of the information relating to the application of Decree 900 was destroyed, it is unlikely that definitive data will emerge (see Comite Interamericano de Desarrollo Agricola, "Tenencia de la Tierra y Desarrollo Socio-Economico del Sector Agricola: Guatemala. Washington, D.C.: Union Panamericana, 1965, p.42n).

Table 15.
TITLING BY YEAR

YEAR	INTA FIGURES			ACTUAL FIGURES	
	n of Titles	n of Hectares	n of Beneficiar.	n of Titles	n of Hectares
1955	3,554	6,568	3,172	3,300	6,295
1956	8,284	76,630	7,699	8,284	76,630
1957	7,505	77,297	7,235	7,235	76,873
1958	1,132	12,228	387	829	5,744
1959	4,401	32,903	3,011	4,343	32,705
1960	1,930	27,931	1,015	1,850	25,172
1961	490	2,240	81	445	1,739
1962	2,734	40,096	876	2,461	40,039
1963	1,001	1,439	0	0	0
1964	298	19	0	0	0
1965	447	4,484	421	447	4,484
1966	522	4,774	45	45	20
1967	700	4,789	686	686	4,439
1968	629	3,390	0	16	5
1969	593	27,996	563	593	27,996
1970	1,509	32,113	1,499	1,499	32,068
1971	437	137	57	437	137
1972	4,643	128,371	3,669	4,475	123,615
1973	3,930	136,303	2,334	3,677	52,874
1974	1,789	32,333	1,012	1,012	5,602
1975	198	8,887	56	59	2,329
1976	2,028	15,957	713	852	6,057
1977	5,739	23,289	2,112	3,130	20,481
1978	4,962	41,130	1,831	1,960	14,549
1979	3,577	37,385	2,188	2,539	33,262
1980	4,269	36,259	2,217	2,609	26,456
1981	10,087	63,339	7,748	7,787	44,934
Totals	77,358	878,288	50,267	60,868	664,525

Table 16.
TITLING BY PRESIDENTIAL PERIOD

YEARS	INTA FIGURES			ACTUAL FIGURES	
	n of Titles	n of Hectares	n of Beneficiar.	n of Titles	n of Hectares
1955 - 58				19,648	165,197
1959 - 62				9,099	99,655
1963 - 66	2,268	10,716	466	790	4,523
1967 - 70	3,431	68,288	2,748	2,794	64,508
1971 - 74	10,799	297,144	7,072	9,601	182,228
1975 - 78	12,927	89,263	4,712	6,001	43,417
1979 - 81	17,933	136,984	12,153	12,935	104,652
Totals	77,358	878,288	50,267	60,868	664,525

Table 17.
TITLING BY TYPE OF PARCEL

TYPE	INTA FIGURES		ACTUAL FIGURES	
	n of Titles	n of Hectares	n of Titles	n of Hectares
Patrimonio Familiar Mixto	22,046	187,114	19,310	155,453
Parcelamientos	16,585	459,265	13,130	293,765
Fincas Cooperativas	10,861	174,608	9,701	171,827
Micro- parcelamientos	11,864	51,544	8,486	40,374
Lotificaciones	16,032	5,757	10,241	3,106
Totals	77,388	878,287	60,868	664,525

Table 18
TITLING BY SIZE BY REGION
(In Hectares)

Region	Less than 7 Hectares	7-25 Hectares	More than 25 Hectares	Totals
Central Highlands	11,606	5,873	2,738	20,217
South Coast	14,800	57,563	9175	81,538
Western Highlands	18,480	20,431	55,537	94,448
North	35,458	145,249	262,891	443,598
Eastern Highlands	3,010	17,100	4,616	24,726
Totals	83,354	246,216	334,957	664,527

Table 19.
TITLING BY DEPARTMENT

DEPARTMENT	INTA FIGURES			ACTUAL FIGURES	
	n of Titles	n of Hectares	n of Beneficiar.	n of Titles	n of Hectares
Guatemala	6,203	7,976	2,226	4,593	7,684
El Progreso	149	3,245	147	147	3,210
Sacatepequez	1,971	2,532	1,351	1,647	1,917
Chimaltenango	3,552	7,798	2,741	3,283	7,406
Escuintla	12,021	114,075	5,754	9,183	65,394
Santa Rosa	1,635	5,265	976	1,271	4,904
Solola	333	310	234	234	225
Totonicapan	0	0	0	0	0
Quetzaltenango	4,501	9,841	1,731	1,978	5,024
Suchitepequez	6,339	85,311	4,930	5,273	49,734
Retalhuleu	3,055	26,167	1,869	1,964	11,241
San Marcos	3,044	23,948	2,357	2,412	17,357
Huehuetenango	2,040	24,440	1,746	1,806	22,106
El Quiche	4,756	79,199	3,785	4,303	63,512
Baja Verapaz	459	8,730	459	459	8,730
Alta Verapaz	16,207	294,271	12,557	14,293	269,203
El Peten	0	0	0	0	0
Izabal	7,770	151,798	5,705	5,963	102,152
Zacapa	1	676	1	1	676
Chiquimula	0	0	0	0	0
Jalapa	0	0	0	0	0
Jutiapa	3,352	32,704	2,058	2,058	24,049
Totals	77,358	878,288	50,267	60,868	664,525

Table 20.
TITLING BY SIZE BY PERIOD

YEARS	Less than 7 Hectares		7 to 25 Hectares		More than 25	
	n of Titles	n of Hectares	n of Titles	n of Hectares	n of Titles	n of Hectares
1955-1962	13,789	30,058	4,206	77,720	1,653	57,764
1959-1962	6,441	3,705	1,003	20,797	1,655	75,153
1963-1966	427	166	363	4,357	0	0
1967-1970	893	4,510	1,614	33,456	2,362	26,542
1971-1974	4,685	12,462	2,554	39,483	2,362	130,283
1975-1978	4,143	7,163	1,653	24,173	205	12,080
1979-1982	8,807	25,289	3,222	46,229	906	33,133
Totals	39,185	83,353	14,615	246,216	9,143	334,957
Average Size		2.22		16.85		36.63

Table 21.
TITLING BY INTERCENSAL PERIOD

YEARS	INTA FIGURES		ACTUAL FIGURES		
	n of Titles	n of Hectares	n of Beneficiar.	n of Titles	n of Hectares
1954 - 1964	31,329	277,351	23,476	29,045	265,216
1965 - 1973	13,410	342,357	9,274	11,875	245,638
1974 - 1981	32,649	258,579	17,877	19,948	153,671
TOTALS	77,388	878,287	50,267	60,868	664,525

TABLE 22 - LAND TENURE PATTERNS IN THE FRANJA TRANSVERSAL DEL NORTE

Department	Private Titles (Hectares)	Colonization Projects & Registered National Lands (Hectares)	Supletory Titles (Hectares)	Farms over 450 hectares Cadaster	Farms over 450 hectares 1979 Ag. Census*
Huehuetenango	17,252	48,824	0	11	17
El Quiche	150,239	117,947	0	17	22
Alta Verapaz	158,794	103,401	21,533	174	158
Izabal	56,123	54,067	0	64	112
Totals	382,408	322,239	21,533	266	309

F T N Total Area	914,000
Less Private Titles	- 382,400
Less Colonization Projects & Registered National Lands	- 322,239
Less Suppletory Titles	- 21,533
Total Baldio	187,820

* Whole Department.

Source Projecto de Colonizacion Zona Norte de la Republica (Franja Transversal), Programa de Trabajo 1979-1982, Agrologia y Catastrol (Datos Preliminares), Departamento de Agrologia y Catastro, Instituto Nacional de Transformacion Agraria, Guatemala, 1982.

TABLE 23 (page 1) - GUATEMALA GROSS DOMESTIC PRODUCT BY MAJOR SECTORS, IN 1970 CONSTANT U.S.DOLLARS AND AS PERCENT[1] OF TOTAL 1970 - 1975

	1970		1971		1972		1973		1974		1975	
	Quetzales (000)	%	Quetzales (000)	%	Quetzales (000)	%	Quetzales (000)	%	Quetzales (000)	%	Quetzales (000)	%
Agriculture [1]	523.6	27.5	560.8	27.9	614.7	28.5	648.1	28.1	690.4	28.2	707.1	28.3
Mining	1.9	0.1	2.0	0.1	1.7	0.1	1.8	0.1	2.3	0.1	2.4	0.1
Manufacturing	304.6	16.0	326.5	16.2	344.5	16.0	372.9	16.2	390.5	15.9	384.4	15.4
Construction	34.3	1.8	34.5	1.7	41.4	1.9	49.4	2.1	46.2	1.9	53.2	2.1
Electricity, Gas & Water	19.0	1.0	20.1	1.0	22.7	1.1	25.0	1.1	27.0	1.1	29.1	1.2
Transportation	80.0	4.2	86.0	4.3	96.4	4.5	106.6	4.6	120.6	4.9	123.2	4.9
Commerce	548.4	28.8	574.1	28.6	693.4	28.0	645.9	28.0	696.0	28.4	688.2	27.5
Banking & Insurance	32.4	1.7	33.4	1.7	53.7	1.7	40.9	1.8	44.3	1.8	47.1	1.9
Housing	135.2	7.1	138.1	6.9	140.9	6.5	143.6	6.2	146.5	6.0	150.6	6.0
Public Administration	108.5	5.7	110.0	5.5	121.8	5.7	124.8	5.4	133.2	5.4	147.8	5.9
Other Services	116.1	6.1	124.8	6.2	134.4	6.2	145.0	6.3	153.9	6.3	165.5	6.6
Total GDP	1,904.0	100.0	2,010.3	100.0	2,157.6	100.0	2,304.0	100.0	2,450.9	100.0	2,498.7	100.0

1/ Percentages may not total 100% due to rounding error.
2/ Includes Forestry, Hunting and Fishing

TABLE 23 (page 2) - GUATEMALA GROSS DOMESTIC PRODUCT BY MAJOR SECTORS, IN 1970 CONSTANT U.S.DOLLARS AND AS PER CENT[1] OF TOTAL 1976 - 1980

	1976		1977		1978		1979		1980[3]	
	Quetzales (000)	%	Quetzales (000)	%	Quetzales (000)	%	Quetzales (000)	%	Quetzales (000)	%
Agriculture [2]	737.8	27.5	768.0	26.6	792.7	26.1	815.8	25.7	830.6	25.2
Mining	3.1	0.1	3.6	0.1	5.6	0.2	10.1	0.3	15.6	0.5
Manufacturing	423.9	15.8	470.2	16.3	500.8	16.5	529.3	16.6	561.7	17.1
Construction	92.4	3.4	104.1	3.6	107.7	3.6	114.8	3.6	115.1	3.5
Electricity, Gas & Water	31.2	1.2	39.2	1.4	43.3	1.4	46.0	1.5	47.5	1.4
Transportation	134.5	5.0	144.6	5.0	155.0	5.1	163.2	5.1	175.0	5.3
Commerce	745.8	27.8	815.6	28.2	852.1	28.1	876.4	27.6	898.0	27.3
Banking & Insurance	49.8	1.9	61.0	2.1	65.9	2.2	78.7	2.5	82.5	2.5
Housing	121.6	4.5	131.7	4.6	140.7	4.6	145.7	4.6	150.2	4.6
Public Administration	165.4	6.2	164.0	5.7	173.0	5.7	184.6	5.8	193.0	5.9
Other Services	177.8	6.6	190.9	6.6	200.6	6.6	215.9	6.8	222.5	6.8
Total GDP	2,683.3	100.0	2,892.9	100.0	3,037.4	100.0	3,180.5	100.0	3,291.7	100.0

1/ Percentages may not total 100% due to rounding error
2/ Includes Forestry, Hunting and Fishing
3/ Preliminary

ANNEX 2.

Computer Program for Determining Land Potentially Arable for Distribution

The methodology for estimating arable land which could be considered available for distribution under current legislation is complicated and requires explanation. The most readily understood way to accomplish this is simply to work through the computer program used in the estimations and to include elucidating remarks as needed.

Table 8B in Annex 1 shows the raw data as listed from the Bovay study of soils in Guatemala. All figures are in thousands of hectares. Definitions of each soil type are given in Table 8A with a comparison between the Bovay and the Guatemalan National Forestry Institute (INAFOR) classification systems. Data on soil use patterns by department are taken from the 1979 Guatemalan agricultural census. For this analysis, cultivated land is defined as land under annual and perennial crops and pasture land, though it is recognized that not all pastures are improved or that they may not meet the required level of grazing intensity set by Decree 1551.

Tables 10 and 11-A through 11-F in Annex 1 show available land as expressed in First Class Equivalent (FCE) land. Again, the methodology here is taken from the Bovay study. In this study, a technique for comparing productivity of soils is presented, with each type of soil given a

productivity ratio. Thus B class land, which is potentially 65 per cent as productive as A class land, has the ratio of .65 First Class Equivalents. To make one hectare of First Class Equivalent land, therefore, requires 1.54 hectares of Class B land. It must be made clear that lands which the government of Guatemala has set aside as archaeological reserves, game reserves, national parks, and forest reserves have been deducted from the computations of land availability. Similarly, land classified in the Bovay study as Class D and E lands, and which is not included in the above mentioned Guatemalan government reserves, has also been subtracted as not arable. Despite this, in several departments such as Sacatepequez, cultivated land area far exceeds the total area of arable land. This confirms what is obvious from casual observation: In many areas of Guatemala there is intensive farming of unsuitable soils and on excessively steep slopes.

Below is the computer program used to generate Tables 9, 10, and 11-A through 11-F. First a list of the primary variables with definitions is presented. Intermediate variables are developed throughout the program and are defined as needed.

Definition of Primary Variables

1. SUPHAS = Surface area in hectares
2. TOTSUP= Surface area in farms in hectares
3. SUPCUL= Surface area under cultivation in hectares
4. A,B,C,D,F,G,= Surface areas of each soil type in hectares
5. ABC= Surface area of arable land, Option 1
6. ABCG= Surface area of arable land, Option 2
7. ABCGF= Surface area of arable land, Option 3
8. FOREST= Surface area in forest land (D+E)
9. SUPNOF= Surface area not in forest land (A+B+C+G+F)
10. BALDIO= Surface area of arable public domain land Option 1, in FCE's
11. OCIOSA= Surface area of arable idle land Option 1, in FCE's
12. BALKARST= Surface area of arable public domain land, Option 2 in FCE's
13. OCIOASKA= Surface area of arable idle land Option 2, in FCE's
14. BALSWAMP= Surface area of arable public domain land, Option 3 in FCE's
15. OCIOSWAM= Surface area of arable idle land, Option 3 in FCE's
16. UNUSED= Surface area of unused public domain land, Option 1
17. UNUSEDK= Surface area of unused public domain land, Option 2
18. UNUSEDF= Surface area of unused public domain land, Option 3
19. AGLAB79= Number of landless laborers, 1979 excluding colonos and mozos. See Table 7
20. MOZOS= Number of landless laborers, 1979 including colonos and mozos. See Table 7

Calculations of Potentially Available Land.

1. Under Decree 1551, an owner may keep at least 10 percent of his land idle without penalty. Thus we calculate the total area by department which may not be legally expropriated, SUPKEEP:

SUPKEEP = SUPCUL + (TOTSUP/10)

2. Calculations of various variables:

ABC= A+B+C (Option 1)

ABCG= A+B+C+G (Option 2)

ABCGF= A+B+C+G+F (Option 3)

UNUSED= ABC - TOTSUP (Option 1)

UNUSEDK= ABCG - TOTSUP (Option 2)

UNUSEDF= ABCGF - TOTSUP (Option 3)

ABCMSUP= ABC - SUPKEEP (Option 1: This is the total area not cultivated or permitted to be idle under Decree 1551).

IF ABCMSUP LESS THAN = 0 THEN ABCMSUP = 0 (If the area not cultivated is negative, in a situation where the area farmed exceeds the area arable, this variable must equal zero.)

IDLETOT = TOTSUP - SUPKEEP (Total of idle lands)

IF IDLE LESS THAN = 0 THEN IDLETOT = 0 (If the area idle is negative, i.e. if owners may legally keep more land under Decree 1551 than is in farms in the department, idle land must be equal to zero).

3. Make negative numbers equal to zero, following the same logic:

IF UNUSED LESS THAN 0 THEN UNUSED = 0

IF UNUSEDK LESS THAN 0 THEN UNUSEDK = 0

IF UNUSEDF LESS THAN 0 THEN UNUSEDF = 0

4. Calculate Baldio and Ociosa lands under Option 1:

IF TOTSUP GREATER THAN ABC THEN BALDIO = 0

IF SUPKEEP GREATER THAN ABC THEN OCIOSA = 0

IF TOTSUP LESS THAN ABC THEN BALDIO = UNUSED x .65

IF SUPKEEP LESS THAN ABC THEN OCIOSA = IDLETOT x .65

The logic followed here is that if the area cultivated exceeds the area of arable land, no arable land can be distributed from public domain (Baldio) lands. If the area which owners may legally keep exceeds the arable area, then no arable land from idle (Ociosa) land can be distributed. Any land, either public domain or idle, which is potentially available, it is assumed, will not be Class A land. This potentially available land is therefore converted to First Class Equivalents (FCE's)

5. Calculate Baldio land under Option 2:

a. IF TOTSUP GREATER THAN ABCG THEN BALKARST = 0

This follows the same logic as in #4.

b. IF TOTSUP LESS THAN ABC THEN BALKARST = (UNUSED x .65)+ (G x .25)

The assumption here is that if all land in farms is less than the total arable land of ABC, then the BALDIO will include first the unused portion of ABC area (.65 to convert to FCE) and then all Karst land (.25 to convert to FCE).

c. IT TOTSUP GREATER THAN ABC AND TOTSUP LESS ABCG THEN BALKARST = UNUSEDK x .25

Here the assumption is that ABC land will be incorporated into farms first and that BALDIO will include only Karst land (.25 to convert to FCE).

6. Calculate Ociosa land under Option 2

a. UNOKA = ABCMSUP + G

IF UNOKA LESS THAN 0 THEN OCIOASKA = 0

UNOKA is the amount of land within farms above the limit of what may be legally kept in idle land under Decree 1551. The assumption here is that farmers will use ABC land first and then the Karst (G) land. Therefore, if the amount which may be legally kept by farmers exceeds the total of ABC and G lands, there will be no idle land for potential distribution.

b. CPUNOKA = ABCMSUP/UNOKA

GPUNOKA = G/UNOKA

If UNOKA is greater than zero, first the proportion of idle land in ABC class is calculated, CPUNOKA. Then the proportion of idle land in Karst is calculated, GPUNOKA.

c. IDLEC = IDLETOT x CPUNOKA

IDLEG = IDLETOT x GPUNOKA

Now the actual hectareage of idle land in ABC class land, IDLEC, and in Karst class land, IDLEG, is calculated by multiplying the proportions of each category of idle land by the total of idle land, IDLETOT.

d. IF SUPKEEP LESS THAN ABC THEN OCIOSAKA = (IDLEC x .65) +
(IDLEG x .25)

IF SUPKEEP GREATER THAN ABC AND SUPKEEP LESS THAN ABCG THEN
OCIOSAKA = IDLETOT x .25

IF SUPKEEP GREATER THAN ABCG THEN OCIOSAKA = 0

These are simply the conversions of idle lands to FCE's. If the area farmers may legally keep under Decree 1551 is less than the total of ABC

land, then the amount of idle ABC land (IDLEC) is converted to FCE's by the .65 ratio. Similarly, idle Karst land (IDLEG) is converted. The last formula simply restates the first formula in this section: If the total farmers may legally keep is greater than the area of arable land, no idle land for distribution exists.

7. Calculate Baldio land under Option 3.

a. IF TOTSUP LESS THAN ABC THEN BALSWAMP = (UNUSED x .65) + (G x .25) + (F x .5).

If there is type ABC land not in farms, i.e. if the total area in farms is less than the total of ABC land, the unused portion of ABC plus all Karst and swamp land are converted to FCE's.

b. IF TOTSUP GREATER THAN ABC AND TOTSUP LESS ABCG THEN BALSWAMP = (UNUSEDK x .25) + (F x .5).

If no ABC land exists outside farms, we assume that Karst land will be used. The unused Karst and swamp land are converted to FCE's.

c. IF TOTSUP GREATER THAN ABCG AND TOTSUP LESS THAN ABCGF THEN BALSWAMP = UNUSEDF x .5.

If neither Karst nor ABC land exist outside farms, then swamp land is the only remaining public domain land and is converted to FCE's.

d. IF TOTSUP GREATER THAN ABCGF THEN BALSWAMP = 0

8. Calculate Ociosa land under Option 3.

a. UNOSW = ABCMSUP + G + F

IF UNOSW LESS THAN = 0 THEN OCIOSWAM = 0

This is the same idle land calculation as part 6.a. with the addition of swamp land.

b. IF UNOSW GREATER THAN 0

CPUNOSW = ABCMSUP/UNOSW (ABC land)

GPUNOSW = G/UNOSW (Karst land)

FPUNOSW = F/UNOSW . (Swamp land)

This set of calculations yields the proportions of each soil type within the idle lands which are subject to expropriation under Decree 1551

c. IDLECS = CPUNOSW x IDLETOT

IDLEGS = GPUNOSW x IDLETOT

IDLEFS = FPUNOSW x IDLETOT

Here the actual hectareage of each type of soil is calculated for idle land beyond the limits allowed by Decree 1551

d. OCIOSWAM = (IDLECS x .65) + (IDLEGS x .25) + (IDLEFS X .5)

Idle lands potentially available for distribution are converted to FCE's and summed.

e. IF SUPKEEP GREATER THAN ABC AND SUKEEP LESS THAN ABCG THEN

GPUNOSW = G/UNOSW

FPUNOSW = F/UNOSW

IDLEGS = GPUNOSW x IDLETOT

IDLEFS = FPUNOSW x IDLETOT

OCIOSWAM = (IDLEGS x .25) + (IDLEFS x .5)

This set calculates the potentially available idle land if the total of cultivated surface of the department is greater than the total of ABC land, but less than the total of ABC land plus Karst.

f. IF SUPKEEP GREATER THAN ABCG AND SUPKEEP LESS THAN ABCGF THEN OCIOSWAM = IDLETOT x .5

If there is no idle land potentially distributable under Decree 1551 other than swamp land, then this calculation will yield the total potentially available under Option 3

g. IF SUPKEEP LESS THAN ABCGF THEN OCIOSWAM = 0

If the total land area which can be protected from expropriation under Decree 1551 exceeds the total of ABC land plus Karst and swamp land, then there is no idle land to distribute.

ANNEX 3

Methodology for Computation of Land Distribution Statistics, 1955-1981

One of the principal objectives of this assessment has been to establish as precisely as possible the magnitude of agrarian transformation activity, measured in terms of the number of beneficiaries and the number of hectares distributed. This task proved to be impossible to pursue with secondary sources, and difficult to do with primary data because of the lack of completely reliable statistical data in the National Agrarian Transformation Institute (INTA).

The principal sources for this analysis are two INTA publications. The first one (INTA 5-81) is a listing of land distribution between 1955-1980 and the second (INTA n.d.) covers the year 1981. The publications summarize land distribution by type, by listing the number of titles, the beneficiary population, and the extension in hectares for each of the five types of land distributed. Both publications also list each individual titling action carried out by INTA, with the following data: type of distribution; name of the community, municipality, and department; number of provisional or definitive titles; extension in hectares; and date of delivery of titles.

According to these publications, a total of 77,388 titles covering a total of 878,287 hectares were distributed by INTA during the period. However, three types of double-counting occur in these documents. First, titles provided for house lots are counted separately from titles provided for farm

land. Since the recipients of house lots are also recipients of one of the other four types of land, each beneficiary who received a house lot is counted twice.

A second form of double-counting occurs because these statistics include the awarding of provisional and definitive titles for a particular parcel of land. Prior to 1962, agrarian reform policy was to provide definitive title when land was originally distributed. After 1962, recipients received a provisional title and were awarded a definitive title after they paid for the land. Consequently, those beneficiaries who received land after 1962 received a second title upon paying off the land and thus are counted twice.

A third form of double-counting occurs because all readjudications of land are recorded as titling actions in the published statistics. If a reform beneficiary loses or abandons his land it is readjudicated, i.e. title is given to another person. When a reform beneficiary dies, his heirs receive a readjudicated title which is counted as a new title in INTA statistics.

The published INTA statistics were analyzed carefully in order to determine the actual number of hectares and parcels of land awarded during the period. A computer data base was created listing all the individual titling actions. These were sorted by name of community and year of adjudication, and a printed report was produced listing the above information. Each titling action was examined carefully to determine whether it was a first-time distribution of land, or a definitive title awarded for a provisionally titled

piece of land, or a readjudication. Each individual titling action was then coded to indicate whether it was a first-time award of land or not. The number of titles and number of hectares were then calculated and compared to official INTA publications. A second set of tabulations were produced which provides more accurate figures for the total amount of land distributed and number of beneficiary families. The actual figures for number of titles and number of hectares were computed by eliminating double-counting. The number of beneficiary families is computed without including the titles for house plots.

ANNEX 4.

Crop and Soil Features of Agriculture in Guatemala with Emphasis on the Northern Lowlands

Guatemala has a diversity of climate as a result of its mountainous character, varying from moist tropic to cool temperate within a relatively short distance and is, therefore, capable of producing a variety of temperate zone and tropical crops.

The country may be divided into six natural regions, as shown in Map 1. Corn is grown in all parts of the country as a subsistence crop by small farmers. Wheat, vegetables and fruit are grown in the Central Highlands. Coffee is cultivated in two separate areas, the Southern Piedmont and the Northern slopes of the Central Highlands in the Department of Alta Verapaz. Bananas are grown in the humid Northern Lowlands near the Atlantic Coast. The Southern Coastal Plain is a fertile region of large farms devoted mainly to cotton, sugarcane and cattle, but also producing rubber and cacao. Most of the Northern Lowlands are in forest.

I. Climate

The mean annual rainfall varies widely throughout the country. Most of the Central Highlands receive 1000 mm, with some areas as little as 500 mm. Rainfall rises to 2000 mm - 3000 mm towards the North in Huehuetenango and Alta Verapaz with a particularly wet spot in the northeast corner of

Huehuetenango having as much as 6000 mm. An area in the Department of Izabal, near the Atlantic Coast also has 3000 mm - 4000 mm. El Peten and most of the Franja Transversal del Norte in the Northern Lowlands have 2000 mm or more. The Southern Piedmont is another area with precipitation as high as 4000 mm or more. Rainfall drops to 1500mm - 2000mm on the Pacific Coastal Plain, the southern end of the plain being the drier.

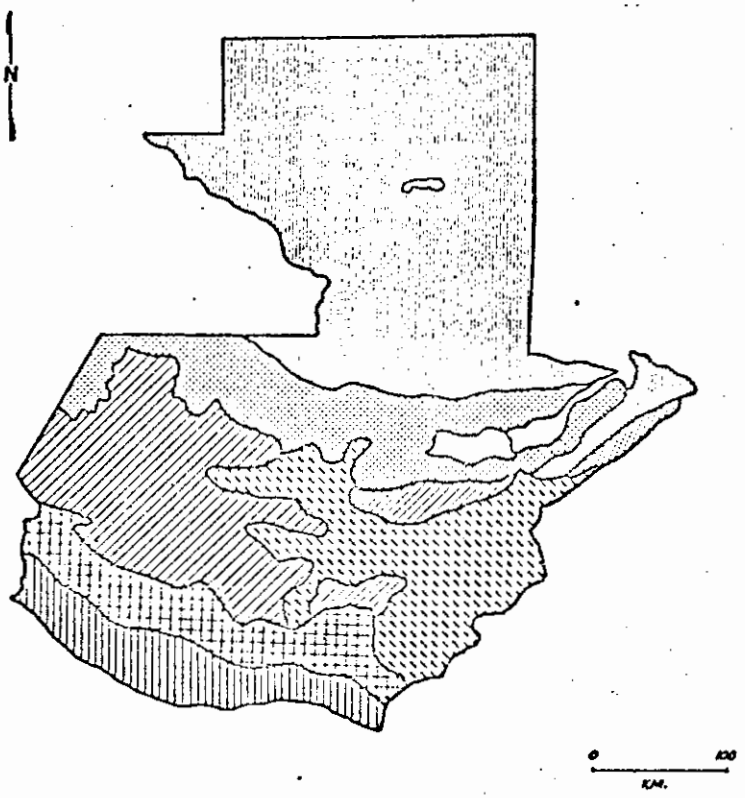
El Peten and the Franja Transversal del Norte (FTN) receive some precipitation every month of the year, with 50 mm - 100 mm falling monthly during November - April, and 200 mm - 300 mm monthly the rest of the year. These areas enjoy 120 - 150 days of rainfall per year. The rainy areas of the northern slope have between 180 and 220 days. The Central Highlands vary from 60 in the east to 90 - 120 days in the west. The Southern Piedmont has 120 - 150 days and the Pacific Coastal Plain from 90 - 150 days, the southern end being the drier.

II. Soils and Land Use Potential

The first comprehensive classification and mapping of the soils of Guatemala was done by Simmons, et al (1959). This study continues to be used as a basic reference by soil scientists although the Bovay group claims that it requires some revisions because of basic changes which have occurred in some soils since 1959. Excellent maps were prepared by Simmons and his collaborators, the Ministry of Agriculture, the Forestry Department (INAFOR), and the Bovay group. In each case, maps showing land use potential were also provided.

MAP No. 1

Natural Regions of GUATEMALA [1]



	WEST CENTRAL HIGHLANDS	(ALTIPLANO CENTRAL)
	EASTERN HIGHLANDS	(ALTIPLANO ORIENTAL)
	SOUTHERN PIEDMONT	(BOCA COSTA)
	NORTHERN SLOPES	(QUEBRADAS DEL NORTE)
	PACIFIC COASTAL PLAIN	(COSTA SUR)
	LOWLANDS OF THE NORTH	(BAJIOS DEL NORTE)

1 Mancer-Cats, Sebald Godfried, Land Tenure and Economic Development in Guatemala. Page 17.

The land use potential map introduces the element of slope, and other factors, which influence the potential use of the land. Seven classes are usually included in the system and these are usually designated with Roman numerals. The Bovay report, however, which is followed in this study, uses equivalent letter designations and separates out the Karst lands as a separate subcategory under Class D. The GOG Forestry Department, INAFOR, uses a system with Roman numeral designations and eight classifications instead of seven (INAFOR: 1976). With minor variations, the systems are in agreement, especially with regard to the potential utility of the soils for agriculture. A condensed version is shown in Table 8A.

Land considered as Class A and suitable for the intensive cultivation of annual crops must have a slope of less than 4 per cent and Class B land less than 8 per cent. Class C land is usually thought of as useful, with restrictions, for perennial crops, pastures or forestry, but is not recommended for annual crops. Only lands in Classes A, B and C have been considered as suitable for colonization. It must be pointed out, however, that a great deal of land in Class D, and below, is already being farmed in Guatemala.

The Pacific Coastal Plain contains the largest area of type A and B land in the country; deep, well drained, highly fertile, capable of being mechanized and irrigated (see Map 2). This area is badly underutilized, with large extensions of land devoted to pasture which could be put to much more economical use in cultivated crops. There is another sizeable area of similar prime land in the department of Izabal. This land surrounds Lake

TABLE 8A - LAND USE POTENTIAL

CLASSIFICATION		DESCRIPTION
Bovay	INAFOR[1]	
A	I	Agricultural lands suitable for intensive cultivation, with little or not limitation; areas with slopes of less than 4%. Suitable for irrigation.
B	II	Lands suitable for intensive cultivation with little limitation; areas with slopes of less than 8%. Limitations imposed by the need to take precautions against erosion. Suitable for irrigation.
C	III IV	Lands requiring feasibility studies to determine whether they may most suitably be used for agriculture (perennial crops), pasture or foresty. Severe limitations imposed by the need to take precautions against erosion. Irrigation possibility limited.
D	V	Lands mostly adapted to forestry, varying in topography from steeply sloping to severely dissected. Soils shallow and seriously subject to erosion. Small pockets of soil suitable for agriculture may be found in valleys and depressions but must be handled with extreme precautions against erosion.
E	VI	Land limited to forestry by extremely broken topography, thin and eroded soils. Mostly deciduous.
F	VII	Swampy and flooded lands under water a good portion of the year.
G[2]	VIII	Forests located on extremely broken topography with thin and eroded soils which must be preserved to protect watersheds and to avoid the destruction of soil and water resources and to protect fragile ecosystems.

1 Instituto Nacional Forestal
2 Includes wetlands.

Izabal and extends to the Bahia de Amatique. There are pockets of this high quality land in Quetzaltenango and Chimaltenango in the Central Highlands. The Highlands are generally overcrowded, with the land being worked beyond its capacity and suffering substantial erosion.

The only large resource of unused land in the country lies in El Peten and in the FTN, covering northern portions of the departments of Huehuetenango, El Quiche, Alta Verapaz,and Izabal. The area described includes most of the Northern Lowlands. Small patches of Class A and B land are to be found in northern El Quiche, Alta Verpaz and Izabal, but the principal agricultural resource of this large area is type C land, limited in use to perennial crops and pasture.

A. Soils

The soils of the FTN and El Peten have been examined by several investigators. The soils are described, with some exceptions, as deep, friable, permeable to moderately permeable clay loams to silty clay loams of a granular structure. Some clays are to be found and some laterite. One small area of laterite, where bricks were being made, was observed in the Ixcan. The soils are leached and relatively infertile as a result of the heavy rainfall and are susceptible to erosion.

Physical structure and permeability are fairly uniform, but there is considerable variation in depth and susceptibility to flooding. Perdomo (1975) describes only one out of 12 samples collected in the FTN as "very deep" (100 - 150 cm), and all the others as "deep" (50 - 100 cm). The depth of the water table also varies considerably. The need for drainage must be taken into consideration in planning for the development of the area. Class F land may be converted to Class C or higher by means of adequate drainage. Perdomo mentions an area in Belize where this has been done; formerly swampy land was converted into a prosperous area producing annual crops.

TABLE 8.B.
DESCRIPTION OF LAND USE POTENTIAL BY DEPARTMENT
(IN 000'S OF HECTARES)

DEPARTMENT	DEPT. TOTAL AREA	FIRST CLASS LAND	SECOND CLASS LAND	MULTIPLE USE LAND	FOREST LAND	RESERVE LAND	SWAMP LAND	KARST FOREST LAND
CHIMALTENANGO	197.9	19.8	31.8		119.3	27.0		
EL PROGRESO	192.2	13.5			148.4	30.3		
GUATEMALA	211.1	15.1	17.1		174.8	4.1		
SACATEPEQUEZ	46.5	2.9			26.8	16.8		
ESCUINTLA	438.4	192.1	188.2		3.0	35.5	19.6	
SANTA ROSA	295.5	52.2	44.8		151.9	26.0	20.6	
HUEHUETENANGO	740.0	9.9		128.4	292.5	141.8	2.7	164.7
QUEZALTENANGO	195.1	15.9	45.5		101.4	29.3	3.0	
RETALHULEU	185.6	71.3	82.7		11.8		19.8	
SAN MARCOS	379.1	20.0	56.6		194.1	99.4	9.0	
SOLOLA	93.1	2.2	4.9		42.6	43.4		
SUCHITEPEQUEZ	251.0	48.9	167.6		25.2	6.6	2.7	
TOTONICAPAN	106.1	2.8	17.5		84.7	1.1		
ALTA VERAPAZ	868.6	57.3		167.8	111.1	122.2		410.2
BAJA VERAPAZ	312.4	21.9			244.9	45.6		
IZABAL	838.6	214.5		135.2	249.0	98.0	73.2	68.7
EL PETEN	3,585.4	19.5		617.4	1,657.2	152.0	101.7	1,037.7
EL QUICHE	837.8	73.1		108.8	278.3	233.0		144.6
CHIQUIMULA	237.6	16.3	54.5		130.0	36.8		
JALAPA	206.3	3.6	33.9		155.6	13.2		
JUTIAPA	321.9	36.8	108.1		161.7	5.1	10.2	
ZACAPA	269.0	35.8			166.6	66.6		
TOTAL	10,809.2	945.4	853.2	1,157.6	4,530.9	1,233.8	262.5	1,825.9

TABLE 8C TOTAL LAND AVAILABLE AND FIRST CLASS EQUIVALENTS,
FRANJA TRANSVERSAL DEL NORTE AND EL PETEN

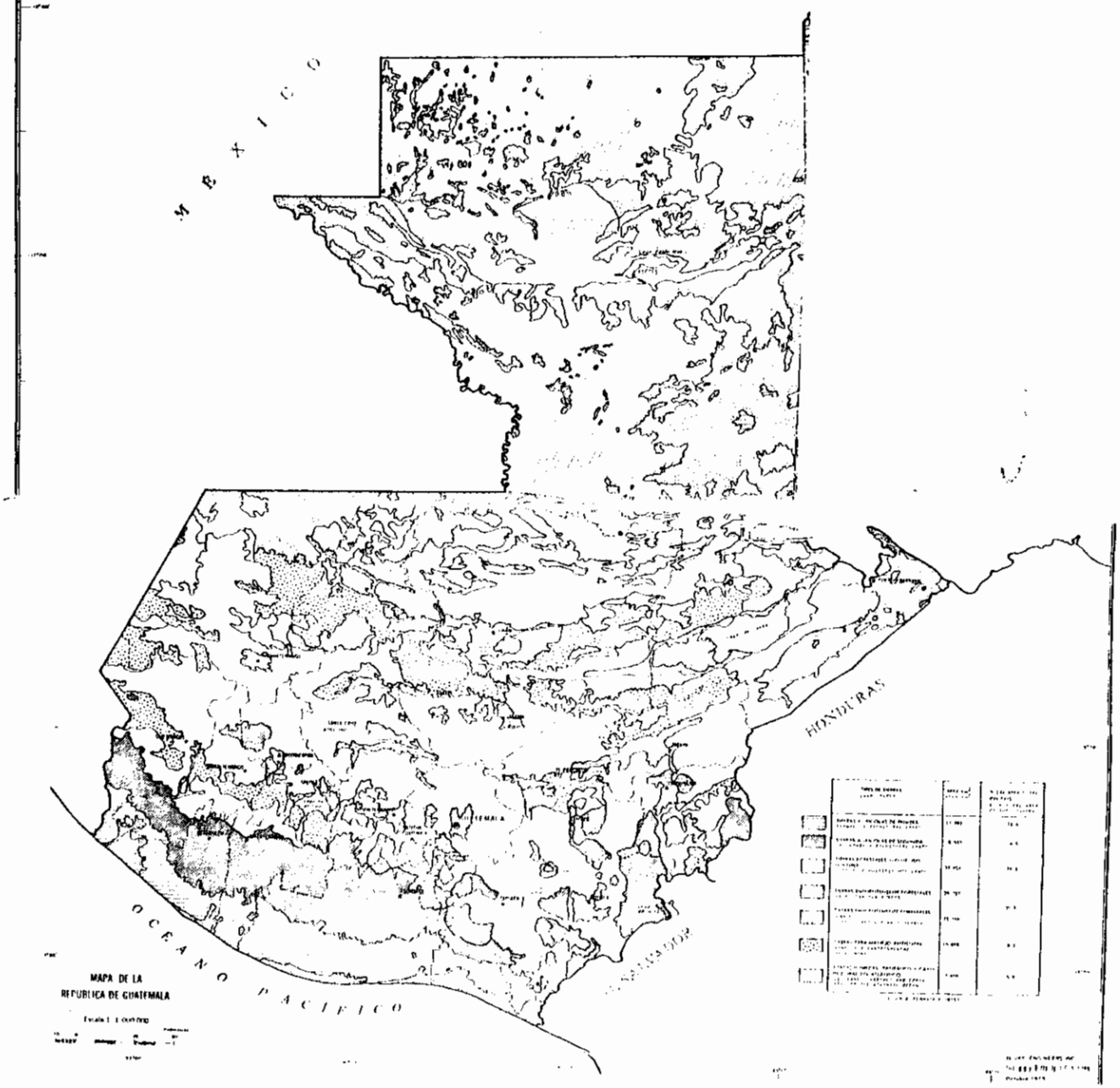
	ACTUAL HECTARES					FIRST CLASS EQUIVALENT[2]			
CLASS	FTN[1]	PETEN	TOTAL	PERCENT	CONVERS. FACTOR	FTN	PETEN	TOTAL	PERCENT
A	442.00	195.00	637.00	1.44		442.00	195.00	637.00	2.78
B	92.50		92.50	0.21	.65	60.13		60.13	.26
C	3,147.50	24,265.00	27,412.50	61.77	.65	2,045.88	15,772.00	17,817.88	77.92
D	263.00		263.00	0.59	.40	105.20		105.20	0.46
E	339.00		339.00	0.76	.20	67.80		67.80	2.38
F	70.00	1,017.00	1,087.00	2.45	.50	35.00	509.00	544.00	2.38
G	4,169.00	10,377.00	14,546.00	32.79	.25	1,042.25	2,594.00	3,636.25	15.90
TOTAL	8,523.00	35,854.00	44,377.00	100.00		3,798.26	19,070.00	22,868.26	100.00

1) Perdomo, 1975
2) To convert land area to First Class Equivalent, Bovay Report, 1975

MAPA 2
MAP 2

RECURSO SUELO
SOIL RESOURCE

DESCRIPCION PRELIMINAR DEL USO POTENCIAL DE LA TIERRA, 1975
PRELIMINARY DESCRIPTION OF THE POTENTIAL LAND USE, 1975



MAPA DE LA
REPUBLICA DE GUATEMALA

B. Karst

A feature which will undoubtedly affect the eventual development of the FTN and the El Peten is the presence of Karst. The north slope of the Central Highlands and the FTN are about 50 per cent Karst and El Peten is about 40 per cent Karst (see Map 2). Karst is defined as: "A limestone region marked by sinks and interspersed with abrupt ridges, irregular protuberant rocks, caverns and underground streams." The total Karst lands of Guatemala are estimated at approximately 23,759 Km^2. All of this lies within the departments of Huehuetenango, El Quiche, Alta Verapaz, Izabal and El Peten.

The Karst soils of Guatemala are acid. Karst soils generally have a very high water conduction rate and a tendency to dry out quickly. Hence, erosion and nutrient loss resulting from the removal of the forest cover is likely to be greater on Karst lands than on others. Karst soils are typically thin and the soil layer may vary from just a few centimeters to half a meter in thickness over the underlying porous limestone. Erosion may result rapidly in a total elimination of soil from the substratum. There is less danger of this on relatively level land than on steep slopes. There is general agreement among persons who have examined the region, however, that Karst lands should be studied very carefully before attempting to use them for agriculture.

The fact of the matter is, however, that a great deal of Karst land has already been cut over and is now being used for agriculture. No doubt this has resulted, and is resulting, in severe deterioration of the soil in some areas as well as potential drainage and flooding problems. There are, however, farms located on Karst which are prosperous and have no erosion

problems. This is because they are under a dense cover of permanent crop, such as coffee with shade trees, so that the soil is never exposed. This implies that if Karst lands are to be used for agriculture at all, the forest cover should be replaced as quickly as possible with something similar in the form of a permanent crop.

The rocky outcroppings, abrupt ridges and sinks found on Karst lands impede their intensive use for annual crops, but some authorities feel that these would not interfere with their extensive use for some perennial crops or pastures. Since the Karst lands are highly variable in topography, depth, drainage and other characteristics, decisions regarding their use should be made in the different micro-environments in which Karst is found. The Soils Department of the Ministry of Agriculture is studying the soils of El Peten and is developing recommendations for the rational management of the Karst lands. As noted above, there are some 23,759 Km^2 of Karst lands in Guatemala. If one supposes that 10,000 Km^2 are so situated that they might rationally be used in agriculture, land for the settlement of a considerable number of additional farmers could be made available.

III. Land Suitability in Northern Lowlands

An estimate of the total land in the FTN and El Peten, taken from Perdomo and the Bovay Report, is shown in Table 8B. Of a total of 44,377 Km^2, it is found that 28,142 Km^2, or 63.42 per cent, fall within Classes A, B and C and are suitable for some form of agriculture. An overwhelming proportion of this, however, falls in Class C and the quantities of Class A

and B soil are inconsequential. In terms of First Class Equivalent (FCE), the total is reduced by about one-half, and the agricultural land by about one-third.

Colonization in the Franja Transversal del Norte and El Peten is essentially limited to Class C land. This means that agriculture will have to be restricted mainly to perennial crops and pasture and that further restrictions will be imposed by slope, type of soil and drainage.

IV. Crops that may be recommended for the Northern Lowlands

Careful study of the terrain is necessary before proceeding with the planting of any crop on a scale beyond what the farmer and his family can consume. The limitations of Class C land plus the peculiarities of the area in terms of Karst lands, drainage and water table levels make prior investigation necessary.

A. Tree Crops

All of the crops discussed here require deep, well drained, well aerated, friable soils. The tree crops require a depth of at least 1 1/2 meters and 2 meters would be better. Black Pepper benefits from 2 meters depth of well-drained soil which helps, among other things, to control Pepper Yellows and Foot Rot. All of the trees require plenty of root room. Poor drainage and high water tables can result in crop failure.

The following points should be considered in selecting a planting site for tree crops:

1. Avoid clay soils.

2. Seek 1 1/2 - 2 m. depth of soil (this automatically rules out most Karst).

3. Make sure the area is well drained, or can be well drained.

4. Avoid areas where the water table rises and stays high for long periods.

5. Stay off steep slopes.

The farmers should be trained to practice soil conservation and soil building techniques such as contour planting, strip planting, rotation, and mulching.

B. Subsistence Crops

Although annual crops are not recommended for planting on Class C lands, there is no way to avoid the planting of the farmer's subsistence crops. These usually consist of corn, beans, rice and squash.

It should be possible, however, to improve the farmer's technique in managing his subsistence plot by planting on the contour, strip planting, intercropping, sequence cropping, and the use of rotation and mulch. The farmer should not follow the practice of slash and burn agriculture, and should learn to get the most out of his single plot. To do this he will have to practice good farming and use soil building and conservation measures.

It has been suggested that the farmer's subsistence plot, which grows annual crops, should be located on that part of the farm least likely to be damaged. With this objective in mind, a colony could plan to have the subsistence plots of all the members located together in such an area.

C. Cash Crops

The following cash crops are suggested as being of potential value to the farmers of the Northern Lowlands and are discussed briefly in the pages which follow:

Root crops; Cassava, Yams, Tiquisque, Taro.

Crops requiring a central processing facility; Oil Palm, Rubber, Citrus, Pejibaye, Coffee, Coconut, Cardamom, Black Pepper, Cacao, Plantains, Macadamia, Kenaf and Rosella, Lumbering.

1. Root Crops

There are several root crops which the farmer can grow for home consumption and for possible sale in local markets. These can replace the plantain in the event that it be made scarce by the Black Sigatoka.

All of these require deep soils, although Taro does well under wet conditions. Any of these might be expanded easily should a market demand arise.

a. Cassava

This is the most widely grown starch plant. It is grown as a vegetable, as an ingredient in cattle feed, and has a range of industrial uses. Cassava plants are sometimes used as temporary shade for cacao, although the disruption caused by the harvesting of the roots makes this practice questionable.

b. Yams (Dioscinen)

These are among the world's oldest food crops and are considered to be only slightly less nutritions than rice and maize. For this reason, yams should be recommended for table use over Cassava. Yams can easily be worked into the cycle of crops planted in the subsistence plot and can be used as an intercrop in new plantings of tree crops.

c. Tiquisque, Yautin, Cocoyam (Xanthosom)

This plant, with its huge leaves, is too bulky to be used as an intercrop and the farmer would probably only keep a few around for home use unless a market demand should arise. This crop also requires a deep, well drained soil. It, too, is much more nutritious than Cassava.

d. Taro (Colocasia)

This plant, like Tiquisque, is a large leaved aroid. It, too, requires a deep soil but grows well under wet conditions. The farmer can, therefore, plant wet spots to Taro. It is much more nutritious than Cassava and the starch has specialty uses for gastro-intestinal patients.

2. Crops requiring a central processing facility

There are several crops which need a central processing facility for successful operation. This require a disciplined organization of the participating farmers who, in turn, would have to have a guaranteed market for their product, at least initially. Members of a colony could cultivate a large planting in a single block by a communal arrangement, or single independent farmers could act as satellite producers for the central facility and receive advice and direction from agents who circulate among them. The type of organization would depend on the desires of the colonists.

a. Oil Palm

The oil palm is the heaviest producer, per hectare and per year, of any known oil crop. Two kinds of oil are produced: "pericarp" oil, expressed from the mesocarp or flesh of the fruit, which has a high content of oleis and palmitic acids; and the kernel oil, found in the albumen of the nut, which has a high content of lauric acid and resembles coconut oil. Palm kernel press cake, containing 18 - 20 per cent protein is used as an ingredient in livestock feed. The fiber remaining after pressing the "pericarp" oil from the fruit is used as fuel in the extracting plant. The extracting plant is, thus, energy efficient.

The fruits must be processed promptly after harvest to avoid spoilage of the pericarp oil. The kernels, however, if properly dried may be kept for long periods. It is because the fruits may not be kept long after harvest that the extracting facilities must be located close to the farm. The farms and factory customarily operate as parts of an integrated system.

The oil palm requires a deep, well drained and well aerated soil, a hot climate and abundant rainfall. It should perform well in the Northern Lowlands. An oil palm project was started at Mopan, in El Peten, but was abandoned. It was said to have been established on deep, well drained soil and that the failure was apparently due to managerial, rather than technical problems.

Disease and insect problems, the intial timing of harvest and the monitoring of fertility required by leaf analysis are further reasons for the integrated approach.

b. Rubber (Heven)

Rubber growing is a well established industry on the Pacific Coastal Plain of Guatemala and it should not be difficult to transfer this expertise to the Northern Lowlands. In fact, the Los Brillantes experiment station has thousands of grafted rubber plants waiting to be shipped to El Peten. These are single graft plants and are resistant to the South American leaf blight disease, but are low yielding. Commercial growers on the Pacific Coastal Plain are planting high yielding clones and prefer to spray for the control of blight. For El Peten conditions, one wonders why Los Brillantes did not prepare three story plants; high yielding trunk with disease-resistant top?

Rubber takes 6 - 7 years to bear, which is a trial for small farmers. It is possible, however, to interplant with other crops for at least three years. Once established, rubber makes a good crop for the small farmers.

c. Citrus

Sweet oranges and limes have been mentioned as possible crops for the Northern Lowlands. Because of the critical timing of harvest and the handling of the delicate fruit, a central canning and/or packing plant would certainly be required.

Deep, well drained soils should be selected. Disease and insect problems should be anticipated. A successful project of this kind is said to exist in Belize; it should be visited in order to anticipate and avoid problems.

d. Pejibaye

This palm produces suckers which arise from the base of the trunk. The tree may be grown to maturity for the fruit, in which case the suckers are not permitted to grow, or it may be grown as suckers only for the "heart of palm", in which case the trees are not grown to maturity. The plants are set at 5 X 5 or 6 X 6 meters for mature trees and 1.5 X 1.5 meters for suckers. It requires a deep, well drained and well aerated soil and should perform well in the Northern Lowlands, with careful prior investigation of site.

Most interest centers, at present, on the growing of suckers for the "heart of palm." The fruit does, however, offer interesting possibilities for human and animal nutrition. It is a good source of Vitamin A. An analysis made in Colombia indicated that it is more nutritious than Opaque-2 (high lysine) corn. Selections have been found with 14 - 25 per cent protein.

Grown for "heart of palm" this crop would require a closely integrated arrangement between the farmers and a nearby cannery. This should be a good crop for the small farmer and, although there is no Pejibaye activity in Guatemala at the moment, the Ministry of Agriculture should investigate this crop by inquiring of the University of Costa Rica and The Ministry of Agriculture, San Jose, Costa Rica, where an intensive research-development project on Pejibaye is in progress.

3. Crops not requiring central processing

a. Coffee

Many small farmers in the Northern Lowlands have a few coffee plants on their property. These are Arabica coffee, Coffea Arabica, and are often found in mixed plantings with other crops. Robusta coffee, C. canephora, would be better adapted to the conditions of the area than Arabian.

Because the farmers concerned are small scale planters, they should be given access to varieties which are resistant to Leaf Rust, caused by Hemilein vastatrix. Varieties of Arabica coffee resistant to Leaf Rust are somewhat lower yielding than the standard commercial varieties. Most cultivars of Robusta coffee are resistant to Leaf Rust and, whether planting Arabian or Robusta, this resistance should be demanded. Robusta coffee is self-sterile and, as a precaution to assure good pollination, a random mix of at least two different cultivars should be planted. Robusta coffee is hardier and higher yielding than Arabica, points which should interest small farmers. Robusta cherries remain on the stem, so that only one harvest need be made. Sun drying is customary.

Both Arabica and Robusta require well-drained soils. Robusta is, however, shallower rooted than Arabica and would be more tolerant of some of the conditions prevailing in the area. The Ministry of Agriculture should examine the possibility of developing a Robusta coffee market in the area for the benefit of the small farmers.

b. Coconut

Farmers are observed to have already planted some coconuts in the FTN. They appear to be largely dooryard plants, however, rather than attempts at commercial enterprise. Extension agents recommend the planting of the Malayan Dwarf coconut to avoid the Lethal Yellows disease. Hybrids which are taller but possess the same resistance should also be introduced. The taller coconuts may be used as shade over cacao.

The coconut makes a good crop for the small farmer in the Northern Lowlands. The fruit is a non-perishable, hermetically sealed, sterile capsule which can be transported through rough country without damage. Alternatively, the coconut meat may be converted into copra on inexpensive driers, using either wood or coconut shells as fuel, which the farmer himself can build. A local diversified industry, producing coconut oil and several by-products, could be based on coconuts produced in the area.

Coconuts require a deep, relatively light, well drained and well aerated soil and will not do well on shallow soils. They need a hot climate and plenty of sunshine and abundant, well distributed rainfall. Shallow Karst soils and those which are poorly drained are to be avoided.

The coconut, backed up by an effective extension program and a good market, can be a profitable source of income for the small farmer.

c. Cardamom

Cardamom is a crop which is well-adapted to the small farmer. All of the work of growing the crop can be done by hand and family labor can be used. The crop is grown under jungle shade so that the soil is protected against erosion. Care should be taken to prevent the shade from becoming too dense; 40 per cent is considered adequate. Guatemala has been exporting Cardamom for some time and there is an assured market.

d. Black Pepper

Pepper is a crop well adapted to the climatic conditions of the Northern Lowlands and should fit well into the small farmer's program. It requires a deep, well drained soil for optimum growth, as well as to reduce attacks by nematodes and the fungus causing Foot Rot. Strong support by the extension service and soils people will be required to assure the establishment of this crop.

e. Cacao

Cacao growing is well established in Guatemala on the Pacific Coastal Plain and has been mentioned as a possible crop for the Northern Lowlands. A small amount has been planted in the FTN. A nursery of seedlings is established there and is said to be waiting to be grafted. Los Brillantes also has a large nursery of seedlings destined for the Northern Lowlands waiting to be grafted.

It is interesting to note that grafted plants should be used on such a scale since a more commonly used planting material is seedling progeny of selected hybrids and certain open-pollinated selections. Also, the locally used planting distance is 4 X 4 m or 4 X 5 m and a population of 625 or 500 trees per hectare, whereas closer planting and a population of twice that or more is common practice today. A move towards the use of seedling planting material might speed up development, since seedlings are much cheaper and faster to produce than grafted plants. Also, a denser stand of trees per hectare should increase yield, as well as reduce control costs.

Cacao requires a deep, well drained, well aerated soil with plenty of root room. A high water table will greatly reduce potential yield. Disease control may be a costly problem. Cacao is a traditional small farmer crop in many countries with the farmers being content to harvest a low yield while investing a minimum of money and effort in improvements. If proper cultural practices are used, however, it can be very profitable.

f. Plantains

Plantains are a traditional home garden food for the small farmer in the tropics. Plantains can also be a valuable cash crop and are often used as shade over cacao and coffee. With the presence of the serious Black Sigatoka leaf spot disease, however, it is doubtful that the small farmer will be able to harvest many plantains. The spray program required to control the disease would be too costly and time-consuming to be economical for him. The Ministry of Agriculture should investigate the possibility of finding cultivars of Musa resistant to the Black Sigatoka with which to replace the plantains now grown.

g. Macadamia

Macadamia is a crop for which there seems to be a continuing good market and a steadily increasing demand. The tree requires deep, well drained soil with plenty of root room. This is not a crop for shallow Karst soils. It can perform well under rainfall varying from 1000 mm to 3000 mm. It should accomodate well in selected areas of the Northern Lowlands.

Macadamia is customarily planted at 35 ft. and persons having to do with such a project should find out whether more recent trials may have shown a closer planting to be more desirable. In any case the wide spacing allows for intercropping during several years in the early growth of the trees. Ground covers will eventually have to be planted to protect the soil against erosion.

Macadamia should be a useful crop with which the small farmer might diversify his activities, The National Association of Coffee Growers, ANACAFE, has been promoting the replacement of coffee with macadamia between 2,000 and 4,500 ft. and has developed expertise with the crop. ANACAFE might serve as a source of information and planting material for the Northern Lowlands.

h. Kenaf and Rosella

The soft fiber contained in the bark of these plants has properties similar to jute fiber and has become an important element in the bagging industry. It is also becoming of increasing importance for the manufacture of paper. Research on Kenaf has been done over a period of many years in Guatemala and two varieties developed in Guatemala, G-4 and G-5, are among the highest yielding.

The root bonat nematode is a serious problem on Kenaf and chemical means have to be used to control this. Rosella, however, is resistant to nematodes and, for this reason, is thought of as a good crop for the small farmer. Rosella seed is very fine and presents a problem in planting. Perhaps a system of diluting the seed with an inert substance might be devised to facilitate planting.

The small farmer should have access to a pond or lake in which to ret the fiber. There is a Kenaf industry in Guatemala and contractual arrangements for the receipt of fiber from a group of small farmers should be possible. The growing of Kenaf or Rosella should be a very good enterprise for the small farmer.

i. Lumbering

A resource which is almost always wasted during land clearing by small farmers is the timber which is felled. The small farmer is seldom in a position to do anything with the timber but to try to get rid of it as quickly as possible, by burning it. Although the more valuable lumber, such as mahogany and cedar, will have been logged off long before, countless thousands of board feet of usable lumber will still be destroyed in land clearing operations.

Through the use of portable sawmills it should be possible to derive some income from the sale of lumber during land clearing operations. Treatment of the wood against boring insects and wood-rotting fungi immediately upon cutting would help to recover much wood which is normally wasted. The establishment of sustained yield forestry projects on land not usable for agriculture should also be considered.

V. Support by Guatemalan Government Agencies

INTA, BANDESA, DIGESA, DIGESEPE and INAFOR all participated in the FTN Land Settlement Project during the period 1975 to the present. All have established headquarters at three locations, Fray Bartolome de las Casas, Raxuha and in the project area, with complete services at the former and partial services at the latter two. All of the agencies had some representation in the field but the coverage was thin, with the exception of FECOAR, a regional cooperative federation, which performed well and conscientiously. Doubtless this extended experience has value for any future land settlement programs which may be attempted in the Northern Lowlands.

There can be no doubt, however, that the coverage of the Northern Lowlands by agricultural personnel is very limited. The shortage of agricultural and livestock extension agents is especially serious. These are the type of technicians most needed. Because of the numerous soils problems prevalent in the area, having to do with Karst soils, erosion control, high water table, etc., a fairly strong contingent of soils specialists should be stationed in the area as well to work with the extension agents. Specialists in new crop and livestock activities have to be present to help in training both extension agents and farmers. Unquestionably all of the agricultural agencies should increase staff. A study by the Guatemalan National Council for Economic Planning published in 1982, found a nationwide shortage of 53 extension agents alone, without contemplating expanded services in the North.

Research in tropical agriculture is an activity in which Guatemala has not been active in during recent years. The Los Brillantes experiment station, located on the Southern Coastal Plain, is really a plant propagation station rather than a research center; thus it is presently unable to provide new research findings to help with the evaluation of agricultural development programs. The present Director is attempting to develop research activities at the station and should be encouraged. Los Brillantes is preparing rubber and cacao planting material for use in the North. To be sure that the latest research findings on projects contemplated for the North are available, it may be necessary to draw on tropical research stations in other countries. A small substation should be established somewhere in the Northern Lowlands to run field trials and do applied research on the various crops to be planted.

The Ministry of Agriculture, through its publications division, the Directorate of Agricultural Teaching and Training (DECA), is actively releasing bulletins and has an information bank of over 1200 publications to draw on. One hundred bulletins are in current release. This department should be willing and able to expand activities to accomodate new demands from the North.

VI. Conclusions

The only large area of land in Guatemala which can be used for colonization is the Northern Lowlands of the Franja Transveral del Norte and El Peten. Unfortunately this is mostly Class C land, suitable only for forestry, pasture and perennial crops. In addition, a considerable portion of

it is Karst land, shallow soil overlying porous limestone and of questionable utility for agriculture. It is the strong opinion of many soil scientists that the Karst land should not be touched but should be left in forest. Some forest reserves and parks have already been established in Guatemala.

On the other hand, Karst land has already been cut over and planted. An attempt to protect the Karst lands would probably be futile. It would, therefore, be advisable for the Guatemalan government to develop a policy for dealing with Karst which would put a good deal of it into forest reserves and parks and to develop techniques for the intelligent management of Karst which is put into agriculture. This kind of assistance and advise should be made available to farmers intensively farming small parcels, or as part of any further colonization efforts.

In this regard, planners should take a conservative, in fact quite modest, view of the numbers of colonists who might be settled in the FTN and El Peten because of the limited amount of deep soil, and the number of areas which are subject to flooding. The tree crops require deep soils and, if grown on shallow soil, are not apt to be very productive. One hears repeated references to shallow-rooted forest trees which tip over in the wind. Several tree crops may be grown profitably in the Northern Lowlands if planted on good sites, if fertilizer requirements are met, and if good cultural practices are followed. The making of such decisions requires the presence in the area of numerous agricultural technicians of several disciplines prepared to advise and assist the colonization planners and the farmers themselves.

VII. Recommendations

A. That the GOG Ministry of Agriculture activate a complete program of research in tropical agriculture at the Los Brillantes experiment station.

B. That a substation be established and staffed in the Northern Lowlands to carry out field trials of new crops, fertilizer use, pest and disease control, and other applied research for the benefit of the small farmers. This should be so located as to have access to both Karst and non-Karst soils. In the interest of speeding the research, the field work should be started immediately; buildings erected later.

C. That the Ministry of Agriculture increase the field staff of extension personnel and soils specialists stationed in the Northern Lowlands to provide an adequate coverage of the area so that all farmers may have access to assistance and advice.

D. That contact be made with the Costa Rican Ministry of Agriculture and the University of Costa Rica, in San Jose, Costa Rica, to obtain planting material and information necessary to establish a pejibaye industry pilot project in the Northern Lowlands. Dr. Jorge Mora Urpi, Dean of the Faculty of Arts and Sciences, U. C. R., is the research chief of the pejibaye development project there.

E. That contact be made with Mr. Fred H. Sherwood, Genl. Mgr., Productos de Kenaf, S.A., 1a Avenida 7-12, Zona 1, Guatemala, regarding the obtaining of seed and information to enable trial plantings of Kenaf and Rosella to be planted in the Northern Lowlands.

ANNEX 5.

Settlement on New Lands and Settlement on Currently Producing Lands:

A Cost and Returns Comparison

A. Costs

First, detailed complete cost records were not maintained for the public sector investment in settling colonizers. Where the records were not adequate, persons who worked on the project in managerial and advisory roles were asked to provide estimates.

For estimating costs, settlement activities were broken down as follows:

1. Recruitment, selection, transfer and initial support.
2. Land surveying (blocks, perimeters, townsites, farm plots, roads and pathways).
3. Public Infrastructure.
   a) Aldea schools (3 rooms)
   b) Center schools (6 rooms)
   c) Health posts (one per center)
   d) Public program facilities construction (offices, shops, warehouses, living quarters, plant nurseries, etc., for INTA, and DIGESA, and other facilities providing staff services to colonizers).
   e) Aldea drying floors (for coffee drying and general community uses).

f) Potable water system (centers, aldeas).

4. Cooperative facilities construction (offices and warehouse space).

5. Roads.

6. Credit

a) Grubstake credit for land clearing and construction of shelter.

b) Operating credit for first year.

7. External technical assistance (ACDI).

Except for grubstake credit and first-year farm operating credit, the above categories do not include farm operating capital requirements. Actual and estimated costs on a per family basis by activity category are shown in Column I of Table 5-1.

Since the project on which these cost data are based was experimental in nature, it is reasonable to assume that if the lessons learned in the pilot effort are applied in a continuing program, cost reductions can be achieved. Column II of Table 5-1 represents best estimates by those who were involved in pilot project implementation in managerial and advisory roles of cost savings that could be achieved in future new lands settlement programs.

These data indicate that actual pilot project costs, excluding credit, totalled $3,914 per family ($373 per hectare). This figure represents sunk (non-recuperable) costs. Total investment, including requirements for first-year credit, is $4,564 per family ($435 per hectare). Best estimates suggest that somewhat more than 50 per cent of the first-year credit granted may be recuperated. Thus, the estimate of total sunk costs is $4,239 per family ($404 per hectare).

TABLE 5-1:Actual/Estimated Settlement Costs for Pilot Colonization Project in the Franja Transversal del Norte, and Projected Future Costs, Per Family and Per Hectare, In Quetzales, Guatemala, 1982

	Cost Base ($)	Number of Families Involved	I Act/Est. Cost Per Family ($)	II Projected Future Cost Per Family ($)
A. DIRECT COSTS				
1. Recruitment, Selection, Transfer and Initial Support	850,000	1,500	567	400
2. Land Surveying (Blocks, perimeters, town-sites, farm plots, roads)	1,000,000	2,000	500.00	200[1]
3. Public Infrastructure Construction				
a. Aldea Schools	17,000 each	60	283	125[2]
b. Center Schools	34,000 each	875	39	39
c. Health posts	24,000 each	875	27	27
d. Program Facilities (Offices, shops, warehouses, living quarters, etc.)	500,000	3,500[3]	143	143
e. Aldea Drying Floors	2,000 each	60	33	33
f. Potable water systems				
- Centers	10,000 each	875	11	11
- Aldeas	5,000 each	60	83	83
4. Roads	2,226,000[4]	3,500	636	636[4]
5. Cooperative Facilities	116,000	3,500	33	33
6. External Technical Asst.	507,000	2,000	254	254[5]
- Sub-Total			$2,609	$1,984

B. INDIRECT COSTS					
7.- General GOG overhead	Estimated at 50% of direct			1,305	992
- Sub Total	-cost per family			$3,914	$2,976
	-cost per hectare			$373	$ 283
C. CREDIT COSTS					
1. Land preparation	Clear 3 hectares at $50/hectare		per family	150	350
2. First Annual operating credit		500	per family	500	500
D. TOTAL COSTS	-cost per family			$4,564	$3,826
	-cost per hectare			$435	$364

[1] Using Metes and Bounds system instead of optical (transit) surveying methods.

[2] Settlers finish school construction after roof structure and floor are completed by contractors.

[3] Number of families for which pilot program designed.

[4] Access to the project site benefited considerably from prior and continuing work on principal access roads from Sebol to Xalbal by the oil companies, the Military and INTA. If future projects do not benefit from similar road construction financed from other sources, road construction costs per family could increase substantially.

[5] Technical assistance mix should shift from major focus on planning and administrative support to agricultural production and local organization.

Project personnel estimate that future programs can realize cost savings in the categories of 1)recruitment and selection; 2) surveying, and 3) aldea school construction. They also believe that additional grubstake credit (Q200) is required for materials for shelter construction. Applying these adjustments to the costs of the pilot project, the following costs are projected for continuing settlement programs:

1) Excluding first year credit

a) per family	$2,976
b) per hectare	$ 283

2) Including first year credit.

a) per family	$3,826
b) per hectare	$ 364

B. Returns

The GOG receives virtually no direct returns from the pilot project. Settlers are required to pay only Q160 for the land received, with Q16 payable on receipt of provisional title and the balance of Q144 payable in equal annual installments over 20 years, without any interest charge. The only significant returns are to settler families from agricultural production.

Net returns to the family were developed from a combination of crop budgets prepared by Ingeniero Xuan (BANDESA) in 1981,[1] and information from persons knowledgeable and experienced in agricultural production in the project area.[2] BANDESA has not had sufficient lending experience in the region to have developed wholly reliable crop budgets for this region. We thus used crop budgets from similar nearby areas (Coban and Fray Bartolome de Las Casas) for additional perspective.

For purposes of analysis, three sets of cropping plans and budget projections were prepared. Utilizing the BANDESA budgets as base information, projections classified as 1) most optimistic, 2) most likely, and 3) most pessimistic, were prepared, both for cropping plans and for crop budgets. Variables considered were; 1) rate of and total amount of land brought into production, 2) costs of production, 3) yields, and 4) prices.

The above described approach was used in lieu of a single set of crop plans and budgets because of:

1) Lack of prior recorded agricultural production experience in the area,

2) Inexperience of the colonizers, e.g., the colonizing families had no prior experience in the area, and many had no prior experience as managers of their own farms, and

3) Downward price trends for major crops being produced for export.

Cropping plans were prepared for four crops: coffee, cardamom, corn and pasture. BANDESA budget information was not available for deriving pasture costs and returns: they are based on knowledgeable judgements.

Cropping plans and criteria applied to the three crop budgets to obtain the three different projections were as follows:

BANDESA budget labor requirements and hired labor costs were accepted unchanged for all budgets. However, it was assumed that all labor would be family labor for food crops, and 50 per cent would be family labor for permanent crops. It also was assumed that subsistence requirements for family labor are equal to two-thirds of the BANDESA specified hired labor wage rate for the area. Thus, family labor is included in the budgets as a family subsistence cost. This means that net returns shown in the budgets are returns after paying for family subsistence expenses. In addition, an interest charge has been included in the budget for the full amount of crop production expenses. Therefore, net returns shown are returns to land, permanent improvements, working capital, management, equity and profits. These returns are available for increased family consumption or investment.

Differences in cropping patterns among the three projections are as follows:

Cropping Pattern (hectares)

Projections	Coffee	Cardamom	Corn*	Pasture*	House, Wood lot, waste, fallow.
Most Optimistic	2	3	2	3	0.5
Most Likely	2	3	2	2	1.5
Most Pessimistic	2	2	2	2	2.5

* Corn and pasture will rotate on a 2 corn-3 pasture or 2 corn-2 pasture rotation.

Differences in rates of bringing land into production for the three projections are as follows:

Year Brought into Production

Projection	1	2	3	4	5	6	7	8	Total
Most Optimistic	2 has	3 has	2 has	-	2 has	1 has	-	-	10has
Most Likely	1 ha	2 has	1 ha	1 ha	1 ha	2 has	-	1ha	9has
Most Pessimistic	1 ha	2 has	1 ha	1 ha	1 ha	1 ha	-	1ha	8has

1) The "most optimistic" projection includes input levels, yields and prices called for in the BANDESA budgets referred to earlier, for all crops budgeted.

2) The "most likely" projection reduced fertilizer use by 30 per cent for coffee (no fertilizer is used for cardamom and corn) below that in the BANDESA budgets, yields were reduced by 25 per cent for all crops from the "most optimistic" levels, and prices remained the same as for the "most optimistic" levels.

3) The "most pessimistic" projections are the same as the "most likely" except that for corn, yields were reduced to two-thirds of "most optimistic" yields, and prices were reduced by ten per cent for coffee and by one-third for cardamom.

From the relevant crop budgets and cropping plans, cash flow projections were made by crop, by year and by hectare. These are shown in Tables 5-14, 5-15 and 5-16 in the Statistical Appendix to this Annex, and are summarized below.

Cash Flow Projections (Quetzales)

Year	Most Optimistic	Most Likely	Most Pessimistic
1	-256	64	40
2	-38	-200	-272
3	-174	-789	-861
4	775	-24	-233
5	3,176	-199	-549
6	5,046	1,109	-851
7	6,732	2,262	1,631
8	6,648	3,278	2,011
9	6,798	3,903	2,328
10	6,798	4,390	2,478
% reduction in full production	----	35% from "most optimistic"	64% from "most optimistic"
Cash flow from one projection to other	----	-----	44% from "most likely"

Internal rates of return on the actual/estimated and the projected costs of colonization, for the three cash flow projection levels are as follows:

Projected Internal Rates of Return (ROR)

	Internal Rate of Return by	
	Actual/Estimated Colonization Cost	Projected Colonization Cost
Cash Flow Projections	of Q4,564	of Q3,826
	(%)	(%)
Most Optimistic	29.42	32.71
Most Likely	8.76	10.96
Most Pessimistic	0.86	2.72

These projections suggest that under the "most optimistic" cash flow projections, rates of return are quite satisfactory (30 to 33 per cent rounded). It should be kept in mind that these returns accrue to the poorest segments of Guatemala's rural society since most of the colonizers were under or unemployed agricultural workers when they were recruited.

The projected ROR under the "most likely" cash flow projections are considerably less satisfactory at a 9 to 11 per cent (rounded) yield. This is less than the open market cost of credit (16 to 22 per cent)in Guatemala. Nevertheless, since economic and social benefits from this type of colonization accrue to the poorest segments of rural Guatemala, these benefits may well be considered to justify the lower ROR.

Even under the "most pessimistic" cash flow projections, ROR remains positive at one to three per cent (rounded)*. This compares favorably with other colonization efforts in Latin America. Derived economic benefits, such as bringing new lands into production and expanding the purchasing power of a segment of the population, and derived social benefits, including the prestige of land ownership and greater opportunities for future generations of the beneficiaries, will accrue to the population from this type of colonization. It is reasonable to assume that the GOG might consider at least this level of subsidy to be justified.

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* Even the "most pessimistic" cash flow projections assume that GOG and cooperative support services will continue to be provided to these colonizers (e.g. credit, input supply, technical assitance and output marketing services).

II. Costs and Returns for Settlement on Existing Productive Lands.

A. Settlement Costs.

The model for which costs have been estimated is based on the following assumptions:

1) A financial system and institutional structure are in place by which willing sellers of large farms and willing buyers from the target group of landless laborers and campesinos with insufficient land can finance their transactions.

2) Willing sellers of large farms will offer for sale significant amounts of productive and/or potentially productive land, and buyers within the target group will buy the land at the price offered (or at a lower negotiated price).

3) Private organizations, such as Fundacion del Centavo, Movimiento de Reconstruccion Rural, cooperatives, etc. will come forward to assist in bringing willing buyers and sellers together, and will assist buyers to arrange the transaction and take possession of the land.

4) The land being purchased is located in settled areas and has been more or less in production for some time or is near to land that has been in production for some time. Thus, basic infrastructure required for production (e.g., roads, input supply and output marketing facilities, credit access, basic support services, technical assistance, etc.), exists in some measure in the area. Additional infrastructure may need to be developed as the permanent settlement of more families (resulting from a shift from large farm to small farm agriculture) exceeds the service capacity of existing infrastructure.

5) Average size of farm will be 4.0 hectares (3.5 producing hectares) of Class A land (or its equivalent). This is the amount estimated to be necessary to fully utilize family labor year-round.

Based on the above described assumptions, costs of settlement are estimated as follows:

B. Direct Costs.	Estimated Cost Per Family
1. Assistance in organizing buyer groups; assistance in negotiating the transaction and in taking possession	Q100
2. Land surveying (to draw bounderies of individual family plots)	100
3. Additional school construction (3 room)	125
4. Additional public services facilities construction or rental	50
5. Potable water system for access by new households	50
6. Additional area access roads or dry season trails	50
7. New or expanded cooperative facilities construction	50
8. External technical assistance	50
Sub-Total (A)	Q575

C. Indirect Costs.

-General GOG overhead at 12% of direct costs*	69
-present value of 4% interest rate subsidy for financing land purchase (Q4,000 amortized over ten years)	292
Sub-Total (B)	Q361

D. Total Costs.

- per family	Q936
- per hectare	Q234

* Since this alternative primarily would be private sector implemented and involves private lands, GOG overhead is expected to be minimal (12 per cent).

It is assumed that land purchase will be paid for by the buyers on a ten year annual amortization basis with interest at 12 per cent. Cost of land purchased is assumed at an average of Q1,000 per hectare for four hectares of Class A land or its equivalent (3.5 producing hectares). In those areas of the country where permanent crops are grown, it is assumed that these crops already are established and in fair condition. (For details, see cropping plans and budgets referred to in the next section.)

An attempt was made to classify and price land in assumed model farms by location, based on interviews with farmers, bankers and agronomists familiar with local conditions. The results are shown in Table 5-17 in the Statistical Appendix. The range in price per farm by location is as follows:

Highlands	Q5,000
Boca Costa	Q4,000
Costa Baja	Q3,750

To simplify the analysis, average cost of purchase was assumed to be Q4,000 per farm of 4.0 hectares (3.5 cropped hectares). This reflects the average price expected to be paid for land.

E. Returns

Crop budgets from BANDESA were used as the basis for estimating net returns. Because BANDESA has had a number of years experience in lending in these areas of existing crop production, it was not considered necessary to provide the three sets of budgets (most optimistic, most likely and most pessimistic) as was done for the FTN*. The only adjustment made to the BANDESA budgets were 1) to apportion total labor used between hired and family in accord with a general estimate of available family labor, and 2) to charge family labor costs (family subsistence) at two-thirds of wage labor costs.

Model cropping patterns and crop budgets for three locations were utilized: Highlands (Solola and Quetzaltenango); Boca Costa (Malacatan and Retalhuleu); Costa Baja (Nueva Concepcion). Table 5-29 (next page) shows model cropping patterns for the three locations. Crop budgets for these crops are included in the Statistical Appendix as Tables 5-18 through 5-28.

Based on these cropping patterns and crop budgets, cash flow projections were prepared. These are shown in detail in Tables 5-31, 5-32 and 5-33 in the Statistical Appendix, and are summarized in Table 5-30 (on page 18).

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* However, sensitivity of internal rate of return to cash flow levels was tested by reducing net cash flow (after land amortization payment) by 50 per cent (see later discussion).

Table 5-29

Model Cropping Patterns

for Three Locations: Settlement on Existing Lands

Through Purchase, Guatemala, 1982

Crops	Locations		
	Highlands	Boca Costa	Costa Baja
	(In Hectares)		
1. Corn/Beans	1.5	-	-
2. Corn/Sesame	-	0.5	3.0
3. Wheat	1.0	-	-
4. Potatoes	0.5	-	-
5. Cabbage	0.5	-	-
6. Coffee	-	2.0	-
7. Cardamom	-	1.0	-
8. Plantains	-	-	0.5
9. House, garden, fruit, waste	0.5	0.5	0.5
Totals	4.0	4.0	4.0

TABLE 5-30 Adjusted Gross Cash Flow Projections
For Three Locations - Settlement on Existing Lands
Through Purchase, Guatemala, 1982

Years	Locations		
	Highlands	Boca Costa	Costa Baja
	(In Quetzales)		
1	2,123	1,766	875
2	2,123	2,256	1,595
3	2,123	3,570	1,595
4	2,123	4,224	1.595
5	2,123	4,224	1,595
6	2,123	4,224	1,595
7	2,123	4,224	1,595
8	2,123	4,224	1,595
9	2,123	4,224	1,595
10	2,123	4,224	1,595

The cash flow projections shown in Table 5-30 represent "adjusted gross income" (after all crop production expenses including family subsistence, but before deducting a land purchase amortization payment). After deducting a land purchase amortization payment of Q708 (amount of annual payment required to amortize Q4,000 over ten years at 12 per cent annual interest), the net cash flows for each of the three locations are as follows (See Tables 5-31 to 5-33 for details):

1. Highlands: Remains unchanged at Q1,415 each year.
2. Boca Costa: Year 1: Q1,058
   Year 2: Q1,548
   Year 3: Q2,862
   Year 4 and each year thereafter: Q3,516
3. Costa Baja: Year 1: Q167
   Year 2 and each year thereafter: Q887

Based on the above net cash flow projections and a settlement cost of Q936 (estimated in the previous section), internal rates of return for the three locations are as follows:

1. Highlands: 151%
2. Boca Costa: 158%
3. Costa Baja: 64%

To test sensitivity to changes in net cash flow, internal rates of return were calculated with net cash flow reduced by 50 per cent. The internal rates of return for net cash flows reduced by 50 per cent were as follows:

1. Highlands: 75%
2. Boca Costa: 93%
3. Costa Baja: 34%

To further test sensitivities of internal rates of return to purchase price of farm land, it was assumed that in the Highlands the 4.0 hectare farm might cost Q8,000 (Q2,286 per producing hectare) instead of Q4,000, and that the interest rate for financing would be 16 per cent instead of 12 per cent. The internal rate of return under these assumptions is 49 per cent. With net cash flow then reduced by 50 per cent, the internal rate of return dropped to 21 per cent (See table 5-31 in Statistical Appendix).

To further test sensitivity in the Highlands, it was assumed that only 50 per cent of the adjusted gross cash flow would be available to amortize the purchase price, with interest at 12 per cent, payable in annual installments over ten years. Under these assumptions, the farmer could make amortization payments of Q1,061 annually. This is sufficient to amortize a purchase price for the farm of Q6,000.

As noted above, family subsistence income is included in the crop budget at a cost (as a return to family labor). The estimates of proportion of total labor for each crop that is provided by the family are based on customary practices. Table 5-34 (in the Statistical Appendix) summarizes hired and family labor requirements for each of the small farm

models used in the analysis. It also shows the amount of subsistence income the family will receive under each model if they provide the proportion of family labor indicated. The amount ranges from Q555 for the Costa Baja model farm to Q1,015 for the FTN model farm with (Q1,010 for the Boca Costa and Q755 for the Highlands). The range of Q755 to Q1,015 is considered adequate to cover basic subsistence for a family of five to six persons.

Subsistence income on the Costa Baja farm is low, as is the amount of family labor utilized on the farm. This is due to the higher level of mechanization in the lower coastal area. This farm family could supplement the subsistence income with part time work on surrounding large farms (cotton and sugar cane harvest). Knowledgeable persons indicate that it is not possible for this farm to shift hired labor inputs into family labor because of the concentration of labor requirements in a very short period of time. In the case of the FTN model farm, the average family probably cannot supply the amount of family labor budgeted (682 days per year). Relatively more hired labor will be required from the BANDESA Budgets, thereby reducing family subsistence income to about Q750 (450 labor days at Q1.67), and slightly increasing total costs of production for the farm (232 labor days with an added cost each day of Q0.83 = Q192) and decreasing "adjusted gross" cash flow from Q1,595 to Q1,403.

III Conclusions

1. FTN colonization cost experience in the pilot project shows acceptable internal Rates of Return (ROR) under the "most optimistic" projections for net crop production income. For the "most likely" and "most pessimistic" projections, although ROR remains positive, the rates drop below probable future commercial interest rates.

2. If target group families could be settled on farms by financing the purchase of existing farm land at 12 to 16 per cent interest over ten years, they can amortize payments and realize a net cash flow that is sufficient to achieve on ROR to settlement costs significantly above that for FTN colonization. Analysis of projected cash flows in three locations under various assumptions showed ROR's above probable future commercial interest rates, even when the projected price of land was doubled and the projected net cash flow was halved. This projection further illustrates the economic inequalities in Guatemala as reflected in the near monopolistic control of land assets.

3. Based on the analysis, target group farm families can be settled on existing farm land through a financially viable voluntary land market system at about 20 per cent of the cost of settling farm families on new lands, and internal rates of return on net cash flows (after land amortization) are considerably higher under the voluntary land market system.

4. Private capital formation by the new lands settler is negative in the first three to five years, whereas private capital formation by the existing lands settler is positive from the first year of settlement onward. The new lands settler's rate of private capital formation after his farm is in full production is higher under the "most optimistic" and "most likely" projections than is that of the existing lands settler. However, on a per hectare basis, the existing lands settler forms private capital at a rate equal to or in excess of the "most likely" new lands projection in all cases except that of settlement in the Costa Baja.

End Notes

[1] BANDESA, "Costos E. Ingresos de Produccion", Guatemala, 1981

[2] David Fledderjohn and David Thompson, ACDI

ANNEX 5.
Statistical Appendix

Table 5-2 Most Optimistic Crop Budget (per hectare)

Crop: Coffee
Location: FTN

	Year 1 (Q)	Year 2 (Q)	Year 3 (Q)	Year 4 (Q)	Year 5 (Q)
I. Direct Costs					
A. Inputs					
1. Fertilizer	70	70	84	84	84
2. Pesticides					
3. Seed	248				
B. Labor					
1. Wage Labor	253	90	115	205	250
2. Family Labor	168	60	77	137	167
-Sub-Total	(739)	(220)	(276)	(426)	(501)
II. Indirect Cost					
1. Interest	74	22	28	43	50
2. Contingency					
-Sub-Total	(74)	(22)	(28)	(43)	(50)
Total Costs	813	242	304	469	551
III. Income					
A. Gross Income					
Yield			30qq	80qq	120qq
Price			Q13	Q13	Q13
Amount			390	1,040	1,560
B. Net Income	-813	-242	86	571	1,009

Table 5-3 Most Optimistic Crop Budget (per hectare)

Crop: Cardamom
Location: FIN

	Year 1 (Q)	Year 2 (Q)	Year 3 (Q)	Year 4 (Q)	Year 5 (Q)
I. Direct Costs					
A. Inputs					
1. Fertilizer					
2. Pesticides					
3. Seed	167				
B. Labor					
1. Wage Labor	114	104	183	254	299
2. Family Labor	76	69	121	169	199
-Sub-Total	(356)	(173)	(304)	(423)	(498)
II. Indirect Cost					
1. Interest	36	17	30	42	50
2. Contingency					
-Sub-Total	(36)	(17)	(30)	(42)	(50)
Total Costs	392	190	334	465	548
III. Income					
A. Gross Income					
Yield			12.5qq	20qq	28qq
Price	Q70	Q70	Q70	Q70	Q70
Amount			875	1,400	1,960
B. Net Income	-392	-190	541	935	1,412

Table 5-4 Most Optimistic Crop: Corn
Location: FTN

Crop Budget (per hectare, one crop)1

	Year 1 (Q)	Year 2 (Q)	Year 3 (Q)	Year 4 (Q)
I. Direct Costs				
A. Inputs				
1. Fertilizer				
2. Pesticides				
3. Seed	3			
B. Labor				
1. Wage Labor				
2. Family Labor	123			
-Sub-Total	(126)			
II. Indirect Cost				
1. Interest	5			
2. Contingency	13			
-Sub-Total	(18)			
Total Costs	144			
III. Income				
A. Gross Income				
Yield	35qq			
Price	Q8			
Amount	280			
B. Net Income	136			

1 One hectare will produce two crops per year.

Table 5-5 Most Likely Crop Budget (per hectare)

Crop: Coffee
Location: FTN

	Year 1 (Q)	Year 2 (Q)	Year 3 (Q)	Year 4 (Q)	Year 5 (Q)
I. Direct Costs					
A. Inputs					
1. Fertilizer	50	50	70	70	70
2. Pesticides					
3. Seed	248				
B. Labor					
1. Wage Labor	253	90	115	205	250
2. Family Labor	168	60	77	137	167
-Sub-Total	(719)	(155)	(262)	(412)	(487)
II. Indirect Cost					
1. Interest	72	16	26	41	49
2. Contingency					
-Sub-Total	(72)	(16)	(26)	(41)	(49)
Total Costs	791	171	288	453	536
III. Income					
A. Gross Income					
Yield			22.5qq	60qq	90qq
Price			Q13	Q13	Q13
Amount			293	780	1,170
B. Net Income	-791	-171	5	327	634

Table 5-6 Most Likely Crop Budget (per hectare)

Crop: Cardamom
Location: FTN

	Year 1 (Q)	Year 2 (Q)	Year 3 (Q)	Year 4 (Q)	Year 5 (Q)
I. Direct Costs					
A. Inputs					
1. Fertilizer					
2. Pesticides					
3. Seed	167				
B. Labor					
1. Wage Labor	114	104	183	254	299
2. Family Labor	76	69	121	169	199
-Sub-Total	(356)	(173)	(304)	(423)	(498)
II. Indirect Cost					
1. Interest	36	17	30	42	50
2. Contingency					
-Sub-Total	(36)	(17)	(30)	(42)	(50)
Total Costs	392	190	334	465	548
III. Income					
A. Gross Income					
Yield			9.5qq	15qq	21qq
Price			Q70	Q70	Q70
Amount			665	1,050	1,470
B. Net Income	-392	-190	331	585	922

Table 5-7 Most Likely

Crop: Corn
Location: FTN

Crop Budget (per hectare, one crop)1

	Year 1 (Q)	Year 2 (Q)	Year 3 (Q)	Year 4 (Q)
I. Direct Costs				
A. Inputs				
1. Fertilizer				
2. Pesticides				
3. Seed	3			
B. Labor				
1. Wage Labor				
2. Family Labor	123			
-Sub-Total	(126)			
II. Indirect Cost				
1. Interest	5			
2. Contingency	13			
-Sub-Total	(18)			
Total Costs	144			
III. Income				
A. Gross Income				
Yield	26qq			
Price	Q8			
Amount	208			
B. Net Income	64			

1 One hectare will produce two crops per year

Table 5-8 Most Pessimistic Crop Budget (per hectare)

Crop: Coffee
Location: FTN

	Year 1 (Q)	Year 2 (Q)	Year 3 (Q)	Year 4 (Q)	Year 5 (Q)
I. Direct Costs					
A. Inputs					
1. Fertilizer	50	50	70	70	70
2. Pesticides					
3. Seed	248				
B. Labor					
1. Wage Labor	253	90	115	205	250
2. Family Labor	168	60	77	137	167
-Sub-Total	(719)	(155)	(262)	(412)	(487)
II. Indirect Cost					
1. Interest	72	16	26	41	49
2. Contingency					
-Sub-Total	(72)	(16)	(26)	(41)	(49)
Total Costs	791	171	288	453	536
III. Income					
A. Gross Income					
Yield			22.5qq		
Price			Q12	Q12	Q12
Amount			270	720	1,080
B. Net Income	-791	-171	-18	267	544

Table 5-9 Most Pessimistic Crop Budget (per hectare)

Crop: Cardamom
Location: FTN

	Year 1 (Q)	Year 2 (Q)	Year 3 (Q)	Year 4 (Q)	Year (Q)
I. Direct Costs					
A. Inputs					
1. Fertilizer					
2. Pesticides					
3. Seed	167				
B. Labor					
1. Wage Labor	114	104	183	254	299
2. Family Labor	76	69	121	169	199
-Sub-Total	(356)	(173)	(304)	(423)	(498)
II. Indirect Cost					
1. Interest	36	17	30	42	50
2. Contingency					
-Sub-Total	(36)	(17)	(30)	(42)	(50)
Total Costs	392	190	334	465	548
III. Income					
A. Gross Income					
Yield			9.5qq	15qq	21c
Price			Q53	Q53	Q53
Amount			504	795	1,113
B. Net Income	-392	-190	-170	330	565

Table 5-10 Most Pessimistic Crop: Corn
Location: FTN

Crop Budget (per hectare, one crop)[1]

	Year 1 (Q)	Year 2 (Q)	Year 3 (Q)	Year 4 (Q)
I. Direct Costs				
A. Inputs				
1. Fertilizer				
2. Pesticides				
3. Seed	3			
B. Labor				
1. Wage Labor				
2. Family Labor	123			
-Sub-Total	(126)			
II. Indirect Cost				
1. Interest	5			
2. Contingency	13			
-Sub-Total	(18)			
Total Costs	144			
III. Income				
A. Gross Income				
Yield	23qq			
Price	Q8			
Amount	184			
B. Net Income	40			

[1] One hectare will produce two crops per year

Table 5-11 - Projected Cropping Plan per Settled Family, by Year and by Hectare, El Colonization, Guatemala, 1982
(Most Optimistic Projection)

Hectares (cleared)	SETTLEMENT YEAR									
	1	2	3	4	5	6	7	8	9	10
1	Corn (1crop)	Corn (2crops)	Coffee established		Coffee begins production (30qq)	80qq	120qq	120qq	120qq	120qq
2	Cardamom established		Cardamom begins production (12.5qq)	20qq	28qq	28qq	28qq	28qq	28qq	28qq
3		Corn (1crop)	Corn (2crops)	Coffee established		Coffee begins production (30qq)	80qq	120qq	120qq	120qq
4		Corn (1crop)	Corn (2crops)	Corn (2crops)	Pasture established	Pasture produces	Pasture produces	Corn (2crops)	Corn (2crops)	Corn (2crops)
5		Cardamom established		Cardamom begins production (12.5qq)	20qq	28qq	28qq	28qq	28qq	28qq
6			Corn (1crop)	Corn (2crops)	Corn (2crops)	Pasture established	Pasture produces	Pasture produces	Corn (2crops)	Corn (2crops)
7			Cordamom established		Cardamom begins production (12.5qq)	20qq	28qq	28qq	28qq	28qq
8					Corn (1crop)	Corn (2crops)	Corn (2crops)	Pasture established	Pasture produces	Pasture produces
9					Corn (1crop)	Corn (2crops)	Cron (2crops)	Pasture established	Pasture produces	Pasture produces
10						Corn (1crop)	Corn (2crops)	Corn (2crops)	Pasture established	Pasture produces

Table 5-12 - Projected Cropping Plan per Settled Family, by Year and by Hectare, FTN Colonization, Guatemala, 1982 (Most Likely Projection)

Hectares (cleared)	SETTLEMENT YEAR 1	2	3	4	5	6	7	8	9	10
1	Corn (1crop)	Corn (2crops)	Coffee established		Coffee begins production (22.5qq)	60qq	90qq	90qq	90qq	90qq
2		Cardamom established		9.5qq	15qq	21qq	21qq	21qq	21qq	21qq
3		Corn (1crop)	Corn (2crops)	Corn (2crops)	Coffee established		22.5qq	60qq	90qq	90qq
4			Corn (1crop)	Corn (2crops)	Corn (2crops)	Pasture established	Pasture	Pasture	Corn (2crops)	Corn (2crops)
5				Cardamom established		9.5qq	15qq	21qq	21qq	21qq
6					Corn (1crop)	Corn (2crops)	Corn (2crops)	Pasture established	Pasture	Pasture
7					(12.5qq)	Cardamom established		9.5qq	15qq	21qq
8						Corn (1crop)	Corn (2crops)	Corn (2crops)	Pasture established	Pasture
9								Corn (1crop)	Corn (2crops)	Corn (2crops)
10	Timber reserve and waste.									

Yields: 75% of most optimistic land brought into production at slower pace.

Table 5-13 - Projected Cropping Plan per Settled Family, by Year and by Hectare, FTN Colonization, Guatemala, 1982 (Most Pessimistic Projection)

SETTLEMENT YEAR

Hectares	1	2	3	4	5	6	7	8	9	10
1	Corn (1crop)	Corn (2crops)	Coffee established		Coffee begins production (22.5qq)	60qq	90qq	90qq	90qq	90qq
2		Cardamon established		9.5qq	15qq	21qq	21qq	21qq	21qq	21qq
3		Corn (1crop)	Corn (2crops)	Corn (2crops)	Coffee established		22qq	60qq	90qq	90qq
4			Corn (1crop)	Corn (2crops)	Corn (2crops)	Pasture established	Pasture	Pasture	Corn (2crops)	Corn (2crops)
5				Cardamom established		9.5qq	15qq	21qq	21qq	21qq
6					Corn (1crops)	Corn (2crops)	Corn (2crops)	Pasture established	Pasture	Pasture
7	Waste									
8						Corn (1crop)	Corn (2crops)	Corn (2crops)	Pasture established	Pasture
9								Corn (1crop)	Corn (2crops)	Corn (2crops)
10	Timber reserve and waste									

Table 5-14 - Projected Cash Flow per Settled Family, by Year and by Hectare, FTN Colonization, Guatemala, 1982
(Most Optimistic Projection)

Hectares	SETTLEMENT YEAR 1	2	3	4	5	6	7	8	9	10
1	136	272	-813	-242	86	571	1,009	1,009	1,009	1,009
2	-392	-190	541	935	1,412	1,412	1,412	1,412	1,412	1,412
3		136	272	-813	-242	86	571	1,009	1,009	1,009
4		136	272	272	-100	50	50	272	272	-100
5		-392	-190	541	935	1,412	1,412	1,412	1,412	1,412
6			136	272	272	-100	50	50	272	272
7			-392	-190	541	935	1,412	1,412	1,412	1,412
8					136	272	272	-100	50	50
9					136	272	272	-100	50	272
10						136	272	272	-100	50
Totals	-256	-38	-174	775	3,176	5,046	6,732	6,648	6,798	6,798

Table 5-15 - Projected Cash Flow per Settled Family, by Year and by Hectare, FTN Colonization, Guatemala, 1982 (Most Likely Projection)

Hectares	SETTLEMENT YEAR 1	2	3	4	5	6	7	8	9	10
1	64	128	-791	-171	5	327	634	634	634	634
2		-392	-190	331	585	922	922	922	922	922
3		64	128	128	-791	-171	5	327	634	634
4			64	128	128	-100	50	50	128	128
5				-392	-190	331	585	922	922	922
6					64	128	128	-100	50	50
7						-392	-190	331	585	922
8						64	128	128	-100	50
9								64	128	128
10	Timber reserve and waste									
Totals	64	-200	-789	-24	-199	1,109	2,262	3,278	3,903	4,390

Table 5-16 - Projected Cash Flow per Settled Family, by Year and by Hectare, FTN Colonization, Guatemala, 1982 (Most Pessimistic Projection)

Hectares	SETTLEMENT YEAR 1	2	3	4	5	6	7	8	9	10
1	40	80	-791	-171	-18	267	544	544	544	544
2		-392	-190	170	330	565	565	565	565	565
3		40	80	80	-791	-171	-18	267	544	544
4			40	80	80	-100	50	50	80	80
5				-392	-190	170	330	565	565	565
6					40	80	80	-100	50	50
7						40	80	80	-100	50
8								40	80	80
9	Timber reserve and waste									
10	Timber reserve and waste									
Totals	40	-272	-861	-233	-549	851	1,631	2,011	2,328	2,478

Table 5-17 - Estimated Cost of Existing Farm Land by Location and Type of Production for Which it is Appropriate
Guatemala, 1982

LOCATION

Type of Land	Highlands			Boca Costa			Costa Baja		
	Number of Hectare	Price Per Hectare (Q)	Total Cost (Q)	Number of Hectare	Price Per Hectare (Q)	Total Cost (Q)	Number of Hectare	Price Per Hectare (Q)	Total Cost (Q)
1. Coffee land with existing plantations in fair condition				2.0	1,500	3,000			
2. Unused land appropriate for Cardamom production				1.0	500	500			
3. Unused land appropriate for plantation production							0.5	500	250
4. Annual crop land of average quality for the area appropriate for corn and secondary crop production or for wheat	2.5	1,000	2,500	0.5	500	500	3.0	1,000	3,000
5. Annual crop land of high quality for the area	1.0	2,000	2,000						
6. Land not appropriated for crops, but appropiated for house, garden, firewood, waste	0.5	500	500	0.5			0.5	500	500
Total	4.0		5,000	4.0		4,000	4.0		3,750

Table 5-18

Crop: Cabbage
Location: Highlands

Crop Budget (per hectare)

	Year 1 (Q)	Year 2 (Q)	Year 3 (Q)	Year 4 (Q)
I. Direct Costs				
A. Inputs				
1. Fertilizer	255			
2. Pesticides	120			
3. Seed	18			
B. Labor				
1. Wage Labor				
2. Family Labor	316			
-Sub-Total	(709)			
II. Indirect Cost				
1. Interest	19			
2. Contingency	71			
-Sub-Total	(90)			
Total Costs	(799)			
III. Income				
A. Gross Income				
Yield	1,800 containers			
Price	1.50			
Amount	2,700			
B. Net Income	1,901			

Table 5-19

Crop: Potatoes
Location: Highlands

Crop Budget (per hectare)

	Year 1 (Q)	Year 2 (Q)	Year 3 (Q)	Year 4 (Q)
I. Direct Costs				
A. Inputs				
1. Fertilizer	420			
2. Pesticides	130			
3. Seed	630			
B. Labor				
1. Wage Labor	215			
2. Family Labor	143			
-Sub-Total	(1,538)			
II. Indirect Cost				
1. Interest	41			
2. Contingency	154			
-Sub-Total	(195)			
Total Costs	1,733			
III. Income				
A. Gross Income				
Yield	400qq			
Price	Q 7			
Amount	2,800			
Net Income	1,067			

Table 5-20 Crop: Beans-Second Crop
Location: Highland

Crop Budget (per hectare)

	Year 1 (Q)	Year 2 (Q)	Year 3 (Q)	Year (Q)
I. Direct Costs				
A. Inputs				
1. Fertilizer				
2. Pesticides	40			
3. Seed	44			
B. Labor				
1. Wage Labor				
2. Family Labor	154			
-Sub-Total	(238)			
II. Indirect Cost				
1. Interest	6			
2. Contingency	24			
-Sub-Total	(30)			
Total Costs	268			
III. Income				
A. Gross Income				
Yield	15qq			
Price	30			
Amount	450			
B. Net Income	182			

Table 5-28

Crop: Corn
Location: Costa Baja

Crop Budget (per hectare)

	Year 1 (Q)	Year 2 (Q)	Year 3 (Q)	Year 4 (Q)
I. Direct Costs				
A. Inputs (Land prep.)	52			
1. Fertilizer	45			
2. Pesticides	55			
3. Seed	25			
B. Labor				
1. Wage Labor	78			
2. Family Labor	52			
-Sub-Total	(307)			
II. Indirect Cost				
1. Interest	8			
2. Contingency	31			
-Sub-Total	(39)			
Total Costs	346			
III. Income				
A. Gross Income				
Yield	55qq			
Price	Q9			
Amount	495			
B. Net Income	149			

Table 5-21

Crop: Corn
Location: Highlands

Crop Budget (per hectare)

	Year 1 (Q)	Year 2 (Q)	Year 3 (Q)	Year 4 (Q)
I. Direct Costs				
A. Inputs				
1. Fertilizer	120			
2. Pesticides	20			
3. Seed	7			
B. Labor				
1. Wage Labor				
2. Family Labor	153			
-Sub-Total	(300)			
II. Indirect Cost				
1. Interest	16			
2. Contingency	30			
-Sub-Total	(46)			
Total Costs	346			
III. Income				
A. Gross Income				
Yield	55qq			
Price	Q 9			
Amount	495			
B. Net Income	149			

Table 5-22

Crop: Corn
Location: Boca Costa

Crop Budget (per hectare)

	Year 1 (Q)	Year 2 (Q)	Year 3 (Q)	Year 4 (Q)
I. Direct Costs				
A. Inputs (Land Prep.)	46			
1. Fertilizer	60			
2. Pesticides	10			
3. Seed	23			
B. Labor				
1. Wage Labor				
2. Family Labor	101			
-Sub-Total	(240)			
II. Indirect Cost				
1. Interest	10			
2. Contingency	24			
-Sub-Total	34			
Total Costs	274			
III. Income				
A. Gross Income				
Yield	66qq			
Price	Q 9			
Amount	558			
B. Net Income	284			

Table 5-23 Crop: Coffee - Maintenance)
Location: Boca Costa

Crop Budget (per hectare)

	Year 1 (Q)	Year 2 (Q)	Year 3 (Q)	Year 4 (Q)
I. Direct Costs				
A. Inputs				
1. Fertilizer	45			
2. Pesticides	45			
3. Seed				
B. Labor				
1. Wage Labor				
2. Family Labor	367			
-Sub-Total	(457)			
II. Indirect Cost				
1. Interest	46			
2. Contingency	46			
-Sub-Total	(92)			
Total Costs	549			
III. Income				
A. Gross Income				
Yield	23qq pergamino			
Price	70			
Amount	1,610			
B. Net Income	1,061			

Table 5-24

Crop: Sesame Second Crop
Location: Boca Costa

Crop Budget (per hectare)

	Year 1 (Q)	Year 2 (Q)	Year 3 (Q)	Year 4 (Q)
I. Direct Costs				
A. Inputs				
1. Fertilizer				
2. Pesticides	20			
3. Seed	8			
B. Labor				
1. Wage Labor				
2. Family Labor	73			
-Sub-Total	(101)			
II. Indirect Cost				
1. Interest	5			
2. Contingency	20			
-Sub-Total	(25)			
Total Costs	126			
III. Income				
A. Gross Income				
Yield	14qq			
Price	30			
Amount	420			
B. Net Income	294			

Table 5-25

Crop: Cardamom
Location: Boca Costa

Crop Budget (per hectare)

	Year 1 (Q)	Year 2 (Q)	Year 3 (Q)	Year 4 (Q)
I. Direct Costs				
A. Inputs				
1. Fertilizer	14	14	42	42
2. Pesticides				
3. Seed	333	33		
B. Labor				
1. Wage Labor				
2. Family Labor	220	88	86	86
-Sub-Total	567	135	388	518
II. Indirect Cost				
1. Interest	45	11	31	41
2. Contingency				
-Sub-Total	(45)	(11)	(31)	(41)
Total Costs	645	155	441	587
III. Income				
A. Gross Income				
Yield			4qq dry	6qq d
Price			400	400
Amount			1,600	2,400
B. Net Income	-645	-155	1,159	1,813

Table 5-26

Crop: Plantains
Location: Costa Baja

Crop Budget (per hectare)

	Year 1 (Q)	Year 2 (Q)	Year 3 (Q)	Year 4 (Q)
I. Direct Costs				
A. Inputs				
1. Fertilizer	60	60		
2. Pesticides				
3. Seed	149			
B. Labor				
1. Wage Labor	173	344		
2. Family Labor	115	229		
-Sub-Total	(497)	(633)		
II. Indirect Cost				
1. Interest	26	61		
2. Contingency				
-Sub-Total	(25)	(51)		
Total Costs	523	684		
III. Income				
A. Gross Income				
Yield		400 containers		
Price		Q 4		
Amount		1,600		
B. Net Income	-523	916		

Table 5-27

Crop: Sesame Second Crop
Location: Costa Baja

Crop Budget (per hectare)

	Year 1 (Q)	Year 2 (Q)	Year 3 (Q)	Year 4 (Q)
I. Direct Costs				
A. Inputs				
1. Fertilizer	5			
2. Pesticides	30			
3. Seed	4			
B. Labor				
1. Wage Labor	94			
2. Family Labor	62			
-Sub-Total	(195)			
II. Indirect Cost				
1. Interest	5			
2. Contingency	20			
-Sub-Total	(25)			
Total Costs	220			
III. Income				
A. Gross Income				
Yield	15qq			
Price	Q30			
Amount	450			
B. Net Income	230			

TABLE 5-29. Model Cropping Patterns

for Three Locations: Settlement on Existing Lands

Through Purchase, Guatemala, 1982

Crops	Locations		
	Highlands	Boca Costa	Costa Baja
	(In Hectares)		
1. Corn/Beans	1.5	-	-
2. Corn/Sesame	-	0.5	3.0
3. Wheat	1.0	-	-
4. Potatoes	0.5	-	-
5. Cabbage	0.5	-	-
6. Coffee	-	2.0	-
7. Cardamom	-	1.0	-
8. Plantains	-	-	0.5
9. House, garden, fruit, waste	0.5	0.5	0.5
Totals	4.0	4.0	4.0

TABLE 5-30 Adjusted Gross Cash Flow Projections

For Three Locations - Settlement on Existing Lands

Through Purchase, Guatemala, 1982

Years	Locations		
	Highlands	Boca Costa	Costa Baja
	(In Quetzales)		
1	2,123	1,766	875
2	2,123	2,256	1,595
3	2,123	3,570	1,595
4	2,123	4,224	1.595
5	2,123	4,224	1,595
6	2,123	4,224	1,595
7	2,123	4,224	1,595
8	2,123	4,224	1,595
9	2,123	4,224	1,595
10	2,123	4,224	1,595

Table 5-31 - Projected Cash Flow per Settled Family, by Year and by Hectare and Farm Total, Net Cash Flow after Land Amortization Payments, and Internal Rate of Return Under two Assumptions, Guatemala, 1982
(Highlands)

Crop and Hectares	SETTLEMENT YEAR 1	2	3	4	5	6	7	8	9	10
1. Corn	224									
Beans (1.5)	273									
2. Wheat (1.0)	141				Same each year					
3. Potato (0.5)	534									
4. Cabbage (0.5)	951									
5. House, garden, fruit, animals (0.5)										
6. Adjusted Gross Cash Flow*	2,123	2,123	2,123	2,123	2,123	2,123	2,123	2,123	2,123	2,123
7. Less Land Amortization[1]	708	1,655[4]	1,061[5]							
8. Net Cash Flow	1,415	468	1,062							
9. Internal Rate of Return(IROR)[2]	151%	49%	113%							
IROR AT 50% Reduction[3] in Net Cash Flow	75%	21%	56%							

* After crop production expenses (including family subsistence) but before land amortization payment

1 Q4,000 for 10 years at 12% interest
2 Initial investment of Q936.00
3 Cash Flow of Q708.00
4 Q8,000 for 10 years at 16% interest
5 This alternative assumes that the farmer can afford amortization payments equal to 50% of his adjusted gross cash flow. Thus, the price he can afford to pay under this criterion is Q1,714 per producing hectare assuming a 12% interest rate and 10 years to pay Q6,000 for a 4.0 hec[illegible] farm with 3.5 producing hectare.

Table 5-32 - Projected Cash Flow per Settled Family, by Year, and by Hectare and Farm Total, Net Cash Flow after Land Amortization Payments, and Internal Rate of Return Under Two Assumptions, Guatemala, 1982
(Boca Costa)

Crops and Hectares	SETTLEMENT YEAR 1	2	3	4	5	6	7	8	9	10
1. Coffee (1.0)	1,061	1,061	1,061	1,061	1,061	1,061	1,061	1,061	1,061	1,061
2. Coffee (1.0)	1,061	1.061	1,061	1,061	1,061	1,061	1,061	1,061	1,061	1,061
3. Cardamom (1.0)	-645	-155	1,159	1,813	1,813	1,813	1,813	1,813	1,813	1,813
4. Corn	142	142	142	142	142	142	142	142	142	142
Ajonjoli (0.5)	147	147	147	147	147	147	147	147	147	147
5. House, Waste, Garden and fruit (0.5)										
6. Adjusted Gross Cash Flow*	1,766	2,256	3,570	4,224	4,224	4,224	4,224	4,224	4,224	4,224
7. Less Land Amortization payments[1]	708	708	708	708	Same each year					
8. Net Cash Flow	1,058	1,548	2,862	3,516	Same each year					
9. Internal Rate of Return (ROR)	158%									
10. ROR at 50% reduction in Net Cash Flow	93%									

* After crop production expenses (including family subsistence), but before land amortization payment
1 Q4,000 purchase price at 12% interest payable over 10 year

Table 5-33 - Projected Cash Flow per Settled Family, by Year and by Hectare, and Farm Total, Net Cash Flow after Land Amortization Payments, and Internal Rate of Return under Two Assumptions, Guatemala, 1982
(Costa Baja)

Crops and Hectares	SETTLEMENT YEAR 1	2	3	4	5	6	7	8	9	10
1. Corn	149	149	149	149	149	149	149	149	149	149
Sesame (1.0)	230	230	230	230	230	230	230	230	230	230
2. Corn	149	149	149	149	149	149	149	149	149	149
Sesame (1.0)	230	230	230	230	230	230	230	230	230	230
3. Corn	149	149	149	149	149	149	149	149	149	149
Sesame (1.0)	230	230	230	230	230	230	230	230	230	230
4. Plantains (0.5)	-262	458	458	458	458	458	458	458	458	458
5. House, garden, fruit (0.5)										
6. Adjusted Gross Cash Flow*	875	1,595	1,595	1,595	1,595	1,595	1,595	1,595	1,595	1,595
7. Less Land Amortization Payments[1]	708	708	Same each year							
8. Net Cash Flow	167	887	Same each year							
9. Internal Rate of Return	64%									
10. IROR AT 50% reduction in Cash Flow	34%									

* After crop production expenses (including family subsistence) but before land amortization payment.

1 Q4,000 purchase price at 12% interest payable over 10 years

Table 5-34 - Full Production Hired and Family Labor Requirements for Selected Small Farm Models, Guatemala, 1982

Crops in Farm[1]	Franja Transversal del Norte			Highlands			Boca Costa			Costa Baja		
	Hectares	Jornales Hired	Family	Hectares	Jornales Hired	Family	Hectares	Jornales Hired	Family	Hectares	Jornales Hired	Family
1. Cardamom	3.0	358	358				1.0	87	87			
2. Corn	2.0 (2crops/yr)		148	1.5		138	0.5		30	3.0	68	68
3. Beans				(1.5) (double crop)		138						
4. Sesame							(0.5) (double crop)		17	(3.0) (double crop)	81	81
5. Coffee	2.0	176	176				2.0		340			
6. Cabbage				0.5		79						
7. Potatoes				0.5	54	54						
8. Plantain										0.5	89	89
9. Wheat				1.0	43	43						
10. Totals	7.0	534	682	3.5	97	452	3.5	87	474	3.5	238	238
Hired Wage Rate		2.50			2.50			3.20			3.50	
Subsistence Rate			1.67			1.67			2.13			2.33
Family Subsistance Income from Farm Labor			Q1,015			Q755			Q1,010			Q555

[1] Labor involved in garden, animals and pasture is not included.

ANNEX 6

Note on Feasibility of Establishing An Active Land Market in Guatemala.

There presently is only a limited land market in Guatemala. Small plots of land are bought and sold among small farmers in the Highlands and some other parts of the country, but these transactions only take place where; 1) the buyer has the cash to pay the purchase price, 2) the seller is willing to finance the sale, or 3) the buyer can borrow funds from a friend or relative, or from some other informal source (such as a money lender). There are no formal institutional sources of financing for land purchase for small farm buyers. Informal land purchase financing usually is for a short time (one to three years). Thus, many campesino families who desire to buy land, and who even may have some funds for a down payment, are excluded from purchasing for lack of a financing mechanism.

Large farms are bought and sold in Guatemala, although more recently, because of guerrilla activity and economic recession, there are few transactions. Even before, sales were limited in number. To be a buyer, one must be well capitalized and, if borrowing from a bank to pay for a part of the purchase price, one must have extensive assets other than the farm to secure the loan.

Large farm sales are too few to establish an active market (and a market price), although most farmers and banks have some impression of the value of land in certain locations. Large farms sell as units or in relatively large tracts. Therefore, a campesino family that wants to buy a few hectares is excluded from access even if it has the purchase price. The only

institutionalized experience in Guatemala of any consequence of financing land purchases by campesinos is that of the Fundacion del Centavo (Penny Foundation). The Fundacion has for several years financed on a small scale the purchase of land by Indian groups. These Indian groups locate the land they want to buy, negotiate a price and agree on the organizational form by which they will own and farm the land. The Fundacion provides the groups with technical assistance in these matters.

The groups usually are five to 20 families in size. Financing is for 20 years at a highly subsidized interest rate. All group members are required to sign jointly and severally on the debt. Some cooperatives make short term loans to their best customers for very small land purchases for farm enlargement.

One option to consider in Guatemala for providing landless campesino families (and campesino families with insufficient land) with access to land is to establish a land market in which they can participate, even though they have little funds for a down payment[1].

Essential characteristics of such a land market might include the following:

1. A financing system that can finance small transactions or multiples of small transactions over a long term (ten years or more) at commercial or less than commercial interest rates, with a modest down payment. Some down payment, however nominal it might be, should likely be required.

2. Availability of land in the market place (offers of land for sale) at prices that permit amortization from production of the financed purchase price, and in addition, provide income for family living expenses.

3. Availability of land in the market place in parcels small enough to permit a campesino family to purchase a small family-size unit and a mechanism by which several campesino families can join together and buy a larger tract, either to farm in common or to divide into family units among themselves.

In order to obtain a first approximation of the feasibility of establishing a land market in Guatemala with these characteristics, informal contacts were made and general discussions were held with a limited number of persons considered to be knowledgeable about agricultural land conditions in Guatemala. The results are summarized below.

A. Establishment of a Financing System.

Selected Guatemalan bankers and farmers knowledgeable about land market conditions in their areas were asked to comment on the feasibility of establishing a "land mortgage company" for financing small farmer land purchases. Responses were positive. Some relevant observations were:

1. The interest rate may have to be subsidized in order that the small farmer does not pay more than eight to 12 per cent interest. The subsidy might be by a) direct payment of the difference between the commercial bank rate and the mortgage rate to the mortgage company (similar to the Farmers Home Administration guaranteed loan in the U.S.), or b) by providing soft loans, or "free" or "low priced" capital to the mortgage company for on-lending.

2. To the question of whether the banking system voluntarily would accept mortgage paper from the mortgage company on a rediscount basis, the response was cautious: a) the paper would have to carry a strong guarantee, probably

from the GOG; b) the mortgage company would have to take full responsibility for loan collecting (i.e., the bank would receive payments from the mortgage company); c) the yield of the discounted mortgage paper would have to be as good as or better than alternative bank investments and/or it would have to qualify as a part of reserve requirements. Income therefrom would not be taxable, or some other type of financial benefit would have to accrue. One alternative suggested was that legislation be approved requiring all banks to carry a certain proportion of their lending portfolio in this mortgage paper.

3. Ways to capitalize the mortgage company were discussed. It generally was felt that a significant amount of initial capitalization would be required from a "soft money" source (GOG, AID, multi-lateral lenders, etc.). A suggestion that banks and "financieras" could subscribe to shares in the mortgage company and pay for them in some proportion to their earnings from rediscounted mortgage paper was met with some skepticism, although not rejected. It was felt that further examination of this option would be required.

B. Availability of Land in the Marketplace.

The general concensus is that a number of large farms in most areas of the country would be offered for sale at acceptable prices, if a financial system were available whereby the seller got his money at the time of turning over possession.

The reasons given as to why large farmers now are ready (and even eager) to sell their land included:

1. Unstable political and security conditions in the country.

2. Existing high debt funding in many large farm operations. In many cases, farm income cannot service the existing debt. This is partially due to the short term nature of virtually all farm debt. Thus, interest rates are at their current high levels, and principal repayment requirements are high.

3. Poor international prices for most large farm export crops, combined with rapidly accelerating input costs has made farming unprofitable for all but the most efficient large farmers. This problem is exacerbated by the generally low efficiency of labor utilization (combined with relatively rapid minimum wage increases) on large farms which suffer from dis-economies of scale in labor use.

4. High accumulated labor obligations (severance and retirement pay obligations).

5. Reduced attractiveness of owning and operating farm land as a hedge against inflation and for financial security, combined with professional and/or urban business options for many traditionally landed family heads of household.

6. Development of a social conscience in some large owners, and a desire on their part to improve the lives of "Colono" families who have worked on their farms for years or generations.

Estimates of the amount of farmed and farmable land, derived from discussions with the knowledgeable persons referred to earlier, that might be offered for sale in the short run were as follows:

1) In coffee producing areas - 150,000 to 200,000 Mz (105,000 to 140,000 ha.)

2) Lower South Coast - 200,000 to 250,000 Mz (140,000 to 175,000 ha.), especially land traditionally used for cotton production

3) Highlands annual cropland - 50,000 to 100,000 Mz (35,000 to 70,000 ha.)

4) Oriente - 100,000 Mz (70,000 ha.)

5) Verapaces - 300,000 to 400,000 Mz (210,000 to 280,000 ha.)

C. Ability of Small Farmers to Buy.

It generally was felt that some kind of support organization would be necessary to assist small farmers to organize themselves into groups, to negotiate the purchase of land and transact the paperwork, to allocate or subdivide it, and to settle into possession. The experience of the Fundacion del Centavo was considered to be quite helpful in this regard. Other organizations named that might fill this role included the Movimiento de Reconstruccion Rural (in the Oriente), and existing cooperative federations. Skepticism was expressed about direct GOG involvement in this process, although there was general agreement that support services (technical assistance, operating credit, marketing services, etc), would need to be forthcoming from the GOG and producer cooperatives.

Some persons expressed the strong opinion that the GOG should not be involved either in operating the mortgage company or in assisting target group families to carry out the purchase transaction.

D. Estimating Magnitudes of Financing Required.

Persons interviewed all urged that any effort to establish a land market financing system should be tested on a small scale until experience is gained. Also, it was felt that care should be taken not to raise expectations unrealistically either on the part of buyers or sellers.

On the basis of estimates made in an earlier section, settlement costs per family on existing farmlands will be Q936. This is assumed to be a public sector cost, although actual settlement assistance probably should be carried out by private sector organizations (cooperatives, Fundacion del Centavo, Movimiento de Reconstruccion Rural, and other private voluntary groups) under contract with the GOG. Average cost of farmland is assumed to be Q1,000 per hectare, and average size farm per family to be 4.0 hectares.

A goal might be established to settle enough families annually to equate to ten per cent of the existing number of landless agricultural familes without permanent jobs (30,000 families annually). To settle 300,000 families (at 30,000 families per year), plus the natural growth of new agricultural families during the settlement period (assuming three per cent per year) would require 12-14 years.

One could assume a start-up period of two to five years, beginning with perhaps 1,000 to 2,000 families in the first year and increasing to a maximum of 30,000 families per year. The arithmetic for a fully functioning operation at 30,000 families settled per year would be as follows:

Year One			
30,000 families	X Q936	=	Q28,080,000
30,000 families	X Q4,000	=	Q120,000.000
Net first-year cost			Q148,000.000
Year Two			
30,000 families	X Q936	=	Q28,080,000
30,000 families	X Q4,000	=	Q120,000,000
Less 30,000 payments at	Q708*	=	- Q 21,240,000
Net second-year cost			Q126,840,000
Year Three			
New financing			Q148,000,000
Repayment (60,000 X Q708)			- Q 42,480,000
Net third-year cost			Q105,520,000
Year Four			
New financing			Q148,000,000
Repayment			- Q 63,720,000
Net fourth-year cost			Q 84,280,000
Year Five			
New financing			Q148,000,000
Repayments			- Q 84,960,000
Net fifth-year cost			Q 63,040,000

Year Six		
New Financing	Q148,000,000	
Repayments	- Q106,000,000	
Net sixth-year cost	Q 41,800,000	
Year Seven		
New Financing	Q148,000,000	
Repayments	- Q127,440,000	
Net seventh-year cost	Q 20,560,000	
Year Eight		
New Financing	Q148,000,000	
Repayments	Q148,680,000	
Net eight-year cost	- Q680,000,000	(surplus)
Cumulative funding requirements for seven years:		Q589,360,000

*First-year land amortization payment

Present value of the eight year funding operation described above (assuming two per cent interest during a ten year grace period, e.g. present AID terms), would have a present value of Q260,620,000, discounted at a rate of 12 per cent. 30,000 families would purchase 105,000 hectares of productive crop land (3.5 hectares per family). If the earlier estimates of land that might come on the market are reasonably correct, enough land potentially would become available in the marketplace for about eight years of operation at this pace (630,000 to 840,000 hectares).

If a system were developed whereby mortgage paper written by the mortgage company were discounted into the banking system, the company could be expected to function with seed capital equal to perhaps ten per cent of the total financing placed. This would require seed-capital as follows:

Year 1	Q12,000,000
Year 2	Q22,000,000
Year 3	Q30,000,000
Year 4	Q35,000,000
Year 5	Q39,000,000
Year 6	Q40,000,000 (fully capitalized)

In addition to the capitalization of the mortgage company, the GOG would be required to fund Q28,000,000 each year in settlement costs. A significant amount of this investment is for public services that are the continuing responsibility of a number of ministries (health, roads, potable water, education, agricultural extension). This amounts to about 40 per cent of total settlement costs, which should constitute an on-going part of ministry

budgets. It might be feasible for the buyer to pay a service fee of Q200 (to be financed), for surveying and settlement assistance. This reduces the direct subsidy to about Q350 per family or about Q10,000,000 annually for settling 30,000 families on purchased lands.

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[1] Peter Dorner, et al, discuss some experiences around the developing world in financing land transfers in "Interventions in Land Markets to Benefit the Rural Poor", Madison, April, 1981, pp.31-44.

GLOSSARY

1.	ACDI	Agricultural Cooperative Development International, the USAID/Guatemala contractor for technical assistance to the colonization project in the Franja Transversal del Norte.
2.	Aldea	A small rural settlement, generally the lowest level of formal civil organization in rural areas.
3.	Altiplano	See Highlands.
4.	Baldio	Land in the public domain, neither titled nor claimed by an individual or by a municipality.
5.	BANDESA	Banco Nacional de Desarrollo Agricola, Guatemala's national bank for agricultural development; makes individual and group loans at all levels and for virtually all purposes, except land purchases.
6.	Boca Costa	See Piedmont.
7.	Costa Baja Costa Sur	See South Coast.
8.	Colono	Permanent resident laborer on a farm who has been given a plot of land to cultivate for subsistence purposes.
9.	Cuerda	Unit of land measured in varas (one vara = 33 inches), may be either 25, 30, 36 or 40 varas square, with 25 varas square being the most common.
10.	DECA	Direccion de Ensenanza y Capacitacion Agricola, a unit under DIGESA which publishes information for farmers as part of the extension service.
11.	Departamento (department)	Sub-national division of government of which there are 22 in Guatemala (excluding Belize); as in most of Latin America, this is a weak level of government.
12.	DIGESA	Direccion General de Servicios Agricolas, a semi-autonomous agency under the Ministry of Agriculture with the primary responsibility of extension in crops production
13.	DIGESEPE	Direccion General de Servicios Pecuarios, a semi-autonomous agency under the Ministry of Agriculture in charge of extension in animal production.

14.	DIRENARE	Direccion de Recursos Renovables, a unit under DIGESA charged with research and support services in renewable resources as part of the extension service, particularly soils analysis.
15.	Ejido	Agricultural community in which land ownership is in the name of the community; individual holdings within the ejido vary in terms of cultivation rights and tenancy, depending upon the ejido's internal structure.
16.	Encomienda	Spanish colonial practice of ceding lifetime control over tracts of land as payment for services or as an honor to servants of the crown; included the use of the resident indigenous population and was imbued with the concept of stewardship, of both the land and the indigenous population, at least in theory if not in practice.
17.	FECOAR	Federacion de Cooperativas Agricolas Regionales, national level federation of regional agricultural cooperatives which was in charge of recruitment and selection, and provided virtually all technical assistance for settlers in the colonization project in the Franja Transversal del Norte.
18.	FENACOAC	Federacion National de Cooperativas de Ahorro y Credito, national federation of savings and loan cooperatives which was somewhat active in the colonization project; primarily makes production loans to individuals.
19.	FCE (First Class Equivalents)	Unit of land equal in productive capacity to one hectare of Class A agricultural land; system developed by the Bovay Engineering group which made an in-depth national soils study in Guatemala in 1974-75; each soil classification group is assigned a conversion ratio for FCE's.
20.	FTN (Franja Transversal del Norte)	Large extension of land in the northern portions of the department of Huehuetenango, El Quiche, Alta Verapaz and Izabal which has been designated by the Guatemalan government as a zone of resettlement and establishment of agricultural communities; site of the AID supported colonization project.
21.	Fundacion del Centavo (Penny Foundation)	Private Guatemalan foundation which makes group loans to cooperatives and other groups for all types of improvements and for the purchase of land.
22.	FYDEP	Empresa de Fomento y Desarrollo de El Peten, independent government company charged with the exploitation and development of El Peten department; in charge of all technical, colonization, and concessions for exploitation of natural resources in El Peten.

23.	Gini Index (Gini Coefficient)	The Gini Index or Gini Coefficient is a measure of the concentration of resources. When applied to land, the Gini Index is based on two variables: farm size and amount of land. The number of farms in each farm size category is compared to the amount of land in each category. In a perfectly equal distribution, the Gini Index would equal 0. The higher the index (100 is the theoretical maximum), the greater the concentration of land in larger farms.
24.	GOG	Government of Guatemala.
25.	Highlands	Generally that area of Guatemala which lies above 1500 meters altitude, though areas below this altitude occur in valleys within the Highlands, normally divided into Western, Central and Eastern Highlands regions.
26.	ICTA	Instituto de Ciencias y Tecnologia Agricola, a semi-autonomous agency under the Ministry of Agriculture devoted to crops research.
27.	INAFOR	Instituto Nacional Forestal, a semi-autonomous agency under the Ministry of Agriculture which performs research, propagation and extension services in forestry; also performs a forest protection function with forestry police.
28.	INDECA	Instituto Nacional de Comercializacion Agricola, a semi-autonomous agency under the Ministry of Agriculture which buys and stores basic grains and promotes commercial agricultural production.
29.	INFOM	Instituto Nacional de Fomento Municipal, an autonomous agency which promotes the development of municipal government and local institutions.
30.	INTA	Instituto Nacional de Transformacion Agraria, an autonomous agency affiliated with the Ministry of Agriculture which has broad responsibility in the development of agricultural and rural areas, including colonization, infrastructure, land titling, taxation, planning, management of National Farms and purchase of private property for redistribution.
31.	Karst	A classification of soils with varying water tables, limestone outcroppings, low water retention, irregular soil depths and high potential for erosion and leaching if the permanent forest cover is removed. See Annex 4 for a detailed description of this soil type.

32.	Landless	For the purposes of this study, heads of household who do not have secure, permanent access to agricultural land; in one section of the study two separate figures are used, one includes mozos and colonos, and one excludes these two groups of permanent employees.
33.	Landpoor	Heads of households who do not have secure, permanent access to sufficient agricultural land to provide subsistence for the nuclear family; 3.9 hectares of First Class Equivalent land is considered to be the lower limit for family subsistence with milpa agriculture.
34.	Latifundia	Tenancy pattern characterized by extensive landholdings which are generally farmed with outdated technology or with very low levels of technology, often including extensive pasture or fallow land.
35.	Lotificacion	Titling process for house plots, may be urban or rural, but does not include agricultural land; titles are to individuals
36.	Manzana	Unit of land equal to 16 cuerdas of 25 varas square, or .7 hectares.
37.	Microparcela-miento	Titling type for small pieces of agricultural land, usually to augment existing holdings in areas where only small parcels (microparcelas) are available; titles are to individuals.
38.	Minifundia	Tenancy pattern characterized by extremely small holdings of agricultural land which are not capable of producing sufficient income to satisfy the needs of the farmer, usually farmed with relatively low levels of technology.
39.	Movimiento de Reconstruccion Rural	A private rural development group; operates primarily in the Oriente of Guatemala; receives some funding from the Guatemalan government and other non-Guatemalan sources; and makes loans for production and construction to small farmers.
40.	Mozo	Laborer; used here as a permanent laborer on a farm, who does not have access to land for growing subsistence crops.
41.	Municipio	The most important level of local government; may be equated to county or township government in the United States; collects taxes, issues land titles, carries out public works and relates as an entity directly to the national government.

42.	Northern Lowlands	Areas below 1500 meters in the northern departments of Huehuetenango, El Quiche, Alta Verapaz, Izabal and El Peten.
43.	Northern Transversal Strip	See Franja Transversal del Norte.
44.	Ociosa	Land which is fallow, abandoned or not used for crops, pasture or forest.
45.	Oriente	The eastern section of Guatemala, includes the departments of Zacapa, Jalapa, Jutiapa, Chiquimula, El Progreso and Santa Rosa.
46.	Parcelamiento	Titling type for issuing family-size plots of land (parcelas) to individual owners.
47.	Patrimonio Agrario Colectivo	Titling process whereby a group of families, which may or may not be a cooperative, receives title collectively to a single parcel of agricultural land.
48.	Patrimonio Familiar Mixto	Titling type in which family-size plots are awarded to individuals, but with pasture land titled on a cooperative basis for use by individuals under provisions set by INTA.
49.	Piedmont (Southern Pidmont)	The Southwestern slopes of the Highlands between 700 and 1500 meters, the transition area between the Highlands and the South Coast.
50.	Quintal	Hundred weight, the most common bulk measure of basic grains in rural areas.
51.	Repartimiento	Award of permanent title to tracts of land during the colonial period by the Crown to individuals; no provisions were made nor responsibility entailed for the indigenous population.
52.	South Coast (South Coastal Plain)	Area between sea level and 700 meters on the southwestern plains of Guatemala; contains the highest concentration of Class A land in the country; area of largest scale and most mechanized agriculture.

53.	Usufruct (usufructo)	Use rights or privileges to land belonging to another; can be for varying periods of time from one crop cycle to lifetime; may entail certain conditions such as a share of the crop or days of labor, etc.; the Spanish definition states that the beneficiary has rights to <u>all</u> the product of the land.
54.	Vara	A measure of length equal to about 33 inches.

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