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FINANCING AGRARIAN REFORM THROUGH
BENEFICIARY PAYMENTS: THE CHILEAN CASE

Richard L. Meyer

Cornell University

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**Department of Agricultural Economics
Cornell University Agricultural Experiment Station
New York State College of Agriculture and Life Sciences
A Statutory College of the State University
Cornell University, Ithaca, New York 14850**

FINANCING AGRARIAN REFORM THROUGH BENEFICIARY PAYMENTS:
THE CHILEAN CASE¹

Richard L. Meyer²

Chapter I

Introduction

Chile is one of the Latin American Countries that seriously tried to respond to the Alliance for Progress goal of effecting agrarian reform so that land would provide economic stability, increased welfare, and a guarantee of freedom and dignity for the man who tills. After his election in 1964, President Frei proposed legislation to accelerate the program of land redistribution first initiated by the government in the 1920's. Little land had actually been affected, however, because of general lack of support by the existing power structure which was reflected by the program's continual inadequate financing, and stringent regulations making land acquisition expensive and legally complex. Between 1928 and the end of 1964, all agrarian reform activities, including both government and Catholic Church programs, affected only 7,626 families and 1,129,933 hectares (3, p.255). Much of this land has limited potential and was located in extreme northern or southern portions of the country. The few plots of good land actually distributed were too small to ever become viable economic units; some were hardly more than family garden size.

Frei's objective, as stated in the presidential campaign, was to create 100,000 property owners during his six-year term of office. Considering the experience of past programs, an effort of this magnitude required an administrative structure much larger than presently existed, drastic changes in constitutional and legislative regulations concerning issues like expropriability of farms and compensation to owners, and financial resources consistent with the projected number of properties and beneficiaries to be involved. Even with a substantial electoral mandate, he was hard pressed to gain congressional approval for the necessary changes if the goal was to be met.

1. Adapted from a thesis presented to the faculty of the Graduate School of Cornell University in partial fulfillment of the requirements for the degree of Doctor of Philosophy.

2. Formerly graduate assistant in the Department of Agricultural Economics, Cornell University, Ithaca, New York. Presently Assistant Professor, Department of Agricultural Economics and Rural Sociology, The Ohio State University, Columbus, Ohio.

Finally in July, 1965, new agrarian reform legislation and a constitutional amendment were passed which incorporated some of the views of the Christian Democratic Party but modified by political compromises forced by both the political left and right in return for their support. Some of the essential features of this legislation will be reviewed later, but one important concept should be noted immediately: beneficiaries of land are expected to pay a major portion of the program's cost before they receive final title to their assigned properties. Thus some of the direct costs of return will be assessed to the persons benefiting from it.

Agrarian reform is by its very nature an expensive program due to the large investment in social overhead capital usually required. But financing becomes an even more crucial problem in cases such as Chile where the political realities at the time of Frei's victory required that land be acquired by expropriation with compensation rather than through confiscation. It is not surprising that beneficiaries of reform would be expected to help share this financial burden when the fiscal budget was also under pressure to finance other high-priority Christian Democratic programs like educational reform and "Chileanization" of the copper mines.

Besides this very practical issue of obtaining sufficient funds for the agrarian reform program, other philosophical and theoretical issues undoubtedly contributed to the adoption of this policy of debt repayment. One of the fundamental reasons given for reform was the need to create a new class of farm owners who would contribute more to the country's needs than the present ones. Creating a sense of social consciousness and responsibility amongst beneficiaries is one of the often repeated objectives of the Agrarian Reform Corporation (CORA), and the orderly payment of financial obligations is regarded as one of the chief symbols of responsibility. In this way, paying debts is considered part of the development of new entrepreneurs.

In recent years when CORA has come under attack by opponents of reform, one of its arguments in support of the program has been the relatively low cost to the Chilean taxpayer. It has been shown that although CORA's total budget has increased from 80,000,000 escudos in 1965 to 417,000,000 in 1968, the portion provided by the national treasury has declined from 86 to 46 percent (5, pp.19-20). Furthermore, almost 80 percent of its budget supposedly consists of investments and expenditures eventually to be recuperated through earnings and beneficiary payments. A larger and larger proportion of the program will be self-financed.

The beneficiaries' ability to pay debts is important because if they do fail to do so, then CORA by implication will have failed in its objective of preparing entrepreneurs. Also, inability to pay or simply a refusal to do so could jeopardize CORA's financial planning and lead to a slow-down in new expropriations and a reduction in technical assistance and credit now considered vital to beneficiaries. These problems would be even more crucial if a new government came to power with less enthusiasm for reform than the present one. Debt assessment needs to be evaluated in relation to beneficiaries' debt repayment capacity under current

and potential farm income. Assessments set too high could cause considerable frustration if beneficiaries become motivated to pay but simply have insufficient income to do so. If all net farm income must be used for debt payment and little remains to raise consumption levels, an important source of motivation will have been lost. Defaulted payments would create collection problems and, conceivably disgruntled beneficiaries could find political support to challenge the existing system, thereby leading to further political conflict in a society already replete with it. If a substantial proportion of them refused to pay, the entire repayment system might collapse.

Objectives of Study

The primary objective of this study is to evaluate the capacity of a selected group of beneficiaries to pay the debts that will be assessed the, considering both present and potential farm income. Secondly, since debt recuperation is only one goal of reform, farm level adjustments to increase debt repayment capacity are analyzed for their impact on other objectives such as increasing gross output and farm employment. Finally some policy alternatives are suggested which might assist the program to more fully achieve its overall goals.

Methodology

The focus of the study is on actual implementation of a program once legislative guidelines and general objectives have been established rather than on the development of an ideal-type model for agrarian reform. Therefore, it was essential to develop a thorough understanding of present and probable future policies and laws which set the parameters within which the program must operate. This was accomplished through a study of the history of Chilean agrarian reform and interviews with CORA officials and other persons knowledgeable about the program.

To evaluate debt repayment capacity it was necessary to develop production alternatives for comparison with the assigned debt. Following discussions with knowledgeable persons in Chile, it was decided that six asentamientos (land reform settlements) would be selected for study. Those chosen had to have been in operation for at least two full crop years, and represent as wide a range of resource endowment and profitability as possible.³ Financial returns for the years 1966/67 and 1967/68 would be used as indices of future profitability with the implicit assumption there would be no substantial changes in production or prices. To

3. Rather than study asentamientos drawn from the entire length of the country, it was decided for reasons of time, travel and basic importance of the region, to concentrate on the area included in CORA's administrative zones III and VI. This encompasses an area beginning approximately 150 kilometers north of Santiago and reaching about 350 kilometers south.

project future debt repayment capacity under good management with efficient farm operation, each of the six was paired with a well-managed private farm having similar soil and water resources. Technical coefficients obtained from these farms were used in a linear programming model to estimate maximum net farm income under assumptions outlined below.

Official CORA records were the source of most of the asentamiento data. Each settlement was visited for at least three or four days to verify the data and collect additional information. Private farm data were obtained from farm accounts which the farm operators had provided to the Catholic University as part of a record-keeping system. Each of these farms was also visited to verify the data.

The future productivity and profitability of reformed farms will undoubtedly be influenced by the ultimate method of ownership and operation chosen by the beneficiaries. However, since this method cannot be predicted with any accuracy, it was assumed that the experience of asentamientos and private farms during the past few years would serve as a guide for anticipating the future. The implication is that the existing size of unit, method of organization and operation, and efficiencies currently obtained will prevail irrespective of the method chosen to assign the land. Should the final assignment result in considerably altered attitudes toward seeking and adopting new technologies, toward utilizing present and forming new capital, and toward work generally, then these projections may be under- or over-estimations.

Furthermore, by selecting the asentamiento as the unit of analysis, it is possible to avoid what CORA will have to do--namely, assign the debt either to individual beneficiaries, or part to beneficiaries and part to a cooperative. Here it is necessary only to consider the debt in aggregate, not how it will be prorated.

Chapter II Description of Agrarian Reform Program

Asentamientos

The legislation sponsored by the Frei government was passed as Law 16,640 on July 16, 1967 and provides the general framework within which CORA must operate. A key provision of the law which gives rise to one of the distinctive characteristics of Chile's present reform program is the creation of an asentamiento¹ on expropriated farms. The Law refers to the asentamiento as the transitional stage between the period when CORA takes possession of the land and such time as it determines its final allocation, and the first step in the social and economic organization of the rural inhabitants who shall work the land. The objectives of the asentamientos are to:

- 1) farm the land in settlement areas efficiently, increasing output with the assistance of the Land Reform Corporation;
- 2) prepare and train settlers so that they may, upon completion of the settlement period, assume their full responsibilities as owner farmers;
- 3) guide and stimulate community development by preparing the way for, promoting the creation and strengthening of cooperatives and other basic organizational units;
- 4) promote the accumulation of capital by settlers ensuring that any increases in income shall be used mainly for this purpose;
- 5) create the necessary minimum infrastructure for the development of the family and community life of settlers and future beneficiaries, and also the infrastructure required for the normal working of the land at the present and in the future (6, p.34).

The asentamiento is to operate for three years but can be extended to five years by the President of the Republic. Those asentamientos established during the first years of the Frei administration ran the full three years, but due to a series of problems which will be outlined later, the tendency now is to shorten the period to as little as six months.

In the period from 1965 to October 31, 1968, 368 asentamientos had been formed consisting of 1,307,000 hectares. Less than 10 percent of the land, 126,000 hectares, were irrigated and 1,181,000 were non-irrigated. CORA's projections through the end of 1968 were for 446 asentamientos with almost 14,000 families benefited. Recent estimates suggest that as many as 20,000 families will be incorporated into asentamientos by the end of February 1970 (12, p.2). This would bring approximately 10 percent of total farmland and over 15 percent of irrigated land in Chile within the agrarian reform.

1. The literal translation for asentamiento is settlement.

To prepare for the ultimate distribution of land following the termination of the asentamiento, CORA is to use this transition period to study the potential of the farm and recommend to the asentados a system of ownership and operation which appears most appropriate. The asentados and CORA must agree on a plan which requires the approval of CORA's Vice-president. The stated principle of the Law is to divide the property into family farms for allocation to individual owners (Article 67). An agricultural family unit is one defined as having adequate resources to permit a family to live and prosper if personally operated in a rational manner (11, p. 270). However, provisions exist for communal ownership where property is assigned to a cooperative, or for mixed systems of both individual and communal ownership. In practice, the latter two systems are giving greatest encouragement because they require less farm infrastructure investment in roads, fences, and canals, and facilitate the distribution of productive inputs and the provision of technical assistance. Regardless of the system chosen, labor is expected to be provided by the beneficiaries and their families. Any occasional labor hired is entitled to share in farm profits.

Beneficiaries of land must be Chileans, capable of working the land, 18 years or older, married or serving as permanent family heads, continually engaged in agricultural work as a farm worker, renter, sharecropper, or landowner of less than one family unit. A point system for selection is used which gives preference to those who have been permanent workers on the farm for three of the last four years prior to expropriation, are asentados on the property at the moment of allocation, or are occupants of the land and personally worked it for at least five consecutive years prior to expropriation.

Once having been assigned the land, beneficiaries must pay for it before receiving final title. They must personally farm it, reside in a place compatible with working it, and belong to an agrarian reform cooperative if so required by CORA. They are prohibited from selling, dividing, renting or mortgaging the land without CORA's prior consent. The land cannot be abandoned and soil fertility must be maintained. If these regulations are violated, CORA can request cancellation of the assignment agreement through Provincial Agrarian Tribunals.

On each asentamiento a Sociedad Agricola de Reforma Agraria (SARA) is formed as the legal entity formalizing the relationship between the asentados and CORA. An actual contract is signed by both parties specifying the rights and responsibility of each. CORA agrees to provide the land and buildings, and advance credit for operating expenses and the purchase of livestock and equipment. Monthly cash advances are made to individual families for personal consumption and investment. Technical assistance is furnished through resident coordinators or mobile teams. The asentados agree to care for the property and provide labor for cooperative farm operations. An operating statement is prepared at the end of each year and net profits are split with CORA usually receiving 10 to 15 percent. The balance is prorated to the asentados on the basis of number of days worked, and all personal cash and non-cash advances received during the year are to be repaid.

2. The name given to the farm workers selected by CORA to be members of asentamientos as the intended future beneficiaries of the land.

Farm management and planning are the primary responsibilities of an asentamiento committee composed of five elected asentados and two CORA representatives. A production plan is developed each year specifying land use, general rotations, input requirements, and estimates of production and profit. These plans become the basic data used by CORA to project and distribute supplies, credit, and market products.

The actual operation of asentamientos varies widely amongst farms and CORA's administrative zones. The economic and social conditions on a farm at the time of expropriation greatly condition the type of operation which will be employed. In addition, the capability and personality of local CORA officials influence what they can achieve within the constraints imposed by the farms and farmers. The staff in one zone was largely drawn from INPROA, the Institute created by the Catholic Church in 1963 to oversee the distribution of church-owned land. Having had this previous experience, these people succeeded in developing a program and enthusiasm unknown in other zones and this was evident in much clearer operating policies and better organized asentamientos.

CORA's philosophy always seemed to be a strange mixture of paternalism and ultimate faith in the asentados. It was generally believed that in the long-run, inexperienced and untrained asentados would quickly learn the basic rudiments of good farm management and assume full responsibility for the farms. Yet out of apparent fear for short-run declines in production and efficiency, CORA maintained a tight rein on asentamiento decision-making. The relationship between CORA and the asentados contained an effective check on each party. Asentados could simply refuse to comply with those CORA plans they considered inappropriate but they had limited access to alternative sources of capital if they chose to strike out on their own.

Most Societies adopted CORA's preference and chose to operate the majority of asentamiento land through communal operations--that is, it is operated and managed as a single unit with each asentado contributing to the overall labor force. Usually the daily activities of the asentados are directed by the Committee President. The production plans specify the fields to be planted to the respective crops and the level of inputs to be used. Some asentados have differentiated roles such as herdsman, or tractor driver, and others specialize in specific crops. Although most of the work is supposed to be performed by asentados, almost all asentamientos hire additional workers, many of whom are relatives of asentados. These workers can either be paid as day laborers or receive a cash advance and have their work days credited towards the respective asentado's share of profits.

CORA provides machinery and livestock, and either charges a rental fee for its use or sells it to the asentados who pay annual installments out of year-end profits. Farm production is sold directly to consumers in roadside stands or open markets, and to traditional intermediaries with production contracts sometimes arranged by CORA.

A few societies have chosen to assign the usufruct of a portion or all of the farm land to group or individual operations. In the former case, a group of asentados rents a particular field or fields and shares in the work and profits according to their own pre-arranged formula. In the latter case, an individual family receives use rights. Marketing may be performed on an individual or group basis but the proceeds are to be used to cancel all advances received during the year and pay a land rental fee to CORA based on gross production.

All asentados, irrespective of the type of farm operations selected for the asentamiento, receive rent-free houses, a small tract of land ($\frac{1}{2}$ hectare or less) usually adjacent to the house for personal use, and grazing rights for a specified number of livestock. The latter is an especially important perquisite because raising livestock is a good method of saving and capital formation in a rapidly inflating economy. To improve the quality of this family-owned livestock, CORA purchases good quality animals for resale to interested asentados with the purchase price added to their personal accounts. Recently there has been dissatisfaction with the amount of land available for personal use so some asentamientos have allocated another $\frac{1}{2}$ to 1 hectare per household. Wives and children of asentados provide most of the labor required in these private plots, and all cash receipts from the sale of any livestock or products, of course, accrue to the family.

As can be readily concluded from this brief description, asentamientos are extremely complex organizations and require considerable financial and human input to function satisfactorily. In early 1969 as the first ones were completing three years of operations, several conclusions could be drawn from their experience. On the positive side, the program was meeting with greater success in production than has been the case in other countries which have attempted state intervention in the agricultural sector. Gross value of output has generally risen from pre-reform levels due to increased yields, a higher proportion of land in high value crops, and a larger amount of land devoted to cultivated crops. Furthermore, the monetary income of asentados has risen except for persons who formerly held farm administrative positions (7, p.63; 8). Thus, they eat and dress better, their homes are more adequately furnished, and they enjoy greater financial security. Many asentados are beginning to participate in farm decision-making for the first time in their lives.

Another plus for the Chilean reform which is undoubtedly related to the one just mentioned is the relatively efficient nature in which CORA has been administered. Seed, fertilizer, machinery, and other supplies generally have been available when needed. Cash advances and wages for hired labor have usually been paid when promised. Considerable investment has been made in housing so that all asentados live in cleaner, healthier surroundings. Literacy classes have been conducted, schools constructed, and cooperatives organized, and perhaps most importantly, the administration has exhibited a willingness to experiment and innovate not often associated with governmental bureaucracies.

In addition to these substantial achievements there are several problems which blemish the asentamiento record. Many of these problems have been recognized by CORA and efforts are being made to correct them. One serious problem is production efficiency. Although gross value of output has increased, some asentamientos could not have paid the high incomes received by asentados and hired laborers if the normal charges for depreciation, maintenance and interest had been made for invested capital. In fact, some operations barely cover direct production costs, implying that asentados should have received little or no return for their contributions of labor and management. This problem can be attributed to insufficient resources for the asentado population, inefficiencies in the use of machinery and hired labor, and a failure to adopt management and production techniques with high marginal returns.

The amount of productive capital per asentado represented by land, buildings, machinery, and livestock, is highly variable among asentamientos. Resources varied prior to expropriation and new investments made by CORA have not always tended to alleviate the situation. A serious fundamental problem faced by CORA has been the inability to shift substantial numbers of families from over- to under-populated farms. People who trace their ancestors for several generations on a particular unit resist moving even though there is promise for higher earning potential on another asentamiento. Likewise, asentados on under-populated farms resist accepting new people knowing full well that the relatively fixed economic pie would have to be split amongst more recipients. An additional troublesome factor has been the lack of clear policy regarding the method by which new asentados can share in the capital already accumulated from past asentamiento operations.

Bookkeeping has been the biggest single complaint expressed by asentados. The system is as accurate and detailed as they could desire but its complexity and the internal accounting system of CORA are such that the final profit statement is often unavailable until six to eight months after the end of the agricultural year. This tardiness, besides creating discontent over not knowing the economic results for the previous year, causes two problems: the results of one year are not available for use in planning the next, and asentados whose withdrawals exceeded their profit shares in one year are not aware of this debt until well into a second year, so late that a reduction in current withdrawals is not likely to compensate for the previous year. Likewise, CORA may feel that cash and non-cash advances are incommensurate with earning capacity but cannot effectively argue for reductions when the data are unavailable. Thus, the system encourages a certain amount of economic irresponsibility, exactly opposite from what CORA hopes to achieve.

This problem is exaggerated on asentamientos with a large proportion of individual operations, where CORA has no direct access to receipts from sales. Besides the usual monthly cash advances, the asentados build up large debts for seed, fertilizer, work animals and livestock advances. Since their land rental is a fixed proportion of gross output, they often report a lower-than-actual total production. Then, upon sale of their products, they may turn over little of the receipts for application to their debts.

This debt problem has another damaging effect on CORA's educational program. It is intended that the asentados recognize the advances for what they are--namely, an advance against future profits which varies with earned farm income. However, when the asentados annually negotiate the amount and terms of payment and are not forced to live consistent with actual earned income, the advances take on the character of wages and CORA becomes more employer than partner. This poses a difficult political dilemma for CORA. Forcing asentado income to a level payable with earned income would mean that real income on some asentamientos would be lower than prereform levels or lower than some private farms.

Like many cooperative and communal experiences elsewhere, worker motivation is a problem on some asentamientos. Participation in farm returns is calculated on the basis of the same per day coefficient, naturally irrespective of the variation in productivity from day to day or asentado to asentado. Obviously some work harder, faster, and more efficiently than others and this results in two tendencies: the slowest effectively set the "work rate" and the rest gravitate to that level, and the more energetic asentados become resentful and demand individual plots rather than continue in cooperative production.

Using labor efficiently is difficult on almost all asentamientos. The tendency is to continue farm operations as they were prior to reform and, of course, these expropriated farms generally had the worst management of any in the country. Work habits were developed under a latifundial system which paid few rewards for energetic performance. If asentamientos are not over-populated at the start, labor usage often grows to excess levels as asentados naturally try to employ increasing numbers of friends and relatives without concomitant increases in farm output. A labor-intensive investment program could absorb some of the labor but such efforts have usually met with limited success. CORA's program to employ asentados in the construction of their own houses was frustrated when they demanded the same pay for this work as any other on the farm rather than work as volunteers. Due to the desire to rapidly increase farm output, land improvement projects are generally performed utilizing skilled labor and heavy equipment rather than through the slower process of asentamiento work animals and machinery.

Asentado participation in planning for new investments has often been minimal. As a result, the type and location of new houses has not been of their choosing and some have actually been left vacant. Providing asentados with credit for housing would probably have resulted in more area for the same money but in a style and location more acceptable.

Investment in other types of farm infrastructure has lagged behind that of housing. Attention has been focused on immediate and obvious problems like granaries, warehouses, fences, access roads, and improvements in irrigation in order to effectively utilize existing resources. In the future, productive investments in orchards, and livestock and poultry operations will be required to increase income earning potential and create additional employment opportunities if the existing asentado population is to be maintained and productive work is to be available for their maturing children.

A final shortcoming recognized by CORA is the lack of information communicated to asentados which would assist them to learn how to become independent entrepreneurs. The overall problem of bookkeeping has already been mentioned but, in addition, information about prices paid and received is often not available when desired. Sometimes supplies are shipped to asentamientos without any billing because prices are not yet even known by CORA. Bulk purchases may have been made by the Central Santiago office and the zonal offices may not have received price information before distribution. Final billing for imports like fertilizer and machinery may be delayed for a year or two until the Central Bank has calculated all costs of foreign exchange, shipping, handling and storage. CORA has now begun distribution of tentative price lists, but with continual inflation, they must be frequently updated to be valid.

Another communication problem exists over the assignment of land. This was especially evident when the writer, visiting one asentamiento nearing the end of its third year, was continually asked by asentados how the land was going to be distributed. Previously, they had received several conflicting viewpoints from CORA officials. This particular case was complicated because it was the first asentamiento in that zone and CORA's policy had not yet been completely formulated.

At least two causes can be identified for the lack of adequate communication: the first concerns the relationship between CORA and the asentados, and the second is an internal problem on the asentamiento itself. The asentados do not deal with a single authoritative CORA representative. Day to day contacts are with the resident Coordinator or members of a Mobile Group who may give some suggestions or interpretation of policy only to be superseded by the Area Supervisor or the Production Chief. Then the Zonal Director might be called in for a final decision. In addition, the Departments of Public Works and Accounting make their own direct contacts with asentados as they perform their functions. The asentados question all these people about various aspects of policy but never learn or clearly understand the respective functions of each, and therefore develop a very confused image of CORA.

A subtle aspect of the communication problem is due to the very nature of social relationships within the society and especially those which traditionally exist in the countryside. Paternalism is likely to dominate interaction between superiors and subordinates and it can inhibit the communication of ideas and information. It also leads to a concentration of administrative power, so that in organizations like CORA, an inordinate number of decisions can only be made at the highest levels and subordinates are simply ordered to carry them out without a sufficient appreciation for their justification. This serves as a model for their relationship with the asentados even though the recognized ideal requires cooperative decision-making. The problem is heightened because most of the trained agriculturalists have received their practical experience on their fathers' farms where a definite patron-campesino structure existed. They internalized the image of decision-making and order-giving as being the appropriate role for farm owners and administrators, and in spite of considerable idealism with respect to agrarian reform, this image is difficult to change.

This problem is further manifest in relations among asentados. The President of the Asentamiento Committee--the person who is really relied on to represent the asentados--is often selected because of his recognized leadership qualifications. Often he will have gained his experience as a member of the administration of the expropriated farm. In a society which stresses status differences, he may soon feel superior to his fellow asentados and plunge into his elected office with considerably more authority than is desirable for the growth and development of the rest. Soon he becomes more manager than representative, and although he is consulted by CORA, he does not adequately consult or communicate with the other asentados. He may act in their best interests but they may not even be aware of it.

These problems outlined above, if taken separately, are certainly not going to determine the ultimate success or failure of the agrarian reform. The ultimate outcome will depend on the performance of individual beneficiaries as independent operators in a socio-economic environment which cannot be fully anticipated now. But if several of these problems obtain in any one asentamiento, they will influence its potential for meeting agrarian reform objectives. The asentamiento stage will definitely affect future attitudes of asentados; it will contribute to determining future income earning potential, and will affect, at least in the short-run, the number of persons the land can support.

It appears to the author that the asentamiento will be especially important in influencing the type of land assignment accepted by the asentados. Clearly CORA would like to encourage cooperative operation, if not communal ownership, to avoid the infrastructure costs associated with creating individual family farms. But they recognize the strong individualistic tendencies of asentados and their desire for separate tracts of land. Thus, the asentamiento serves as an important demonstration of what can be accomplished by cooperative action. If they are economically and socially successful, CORA can argue that it is largely due to this particular form of farm operation and, perhaps, convince the asentados to initially assign the land to a cooperative in which they all would be members. But if the asentamiento does not live up to expectations, the demand for individual titles will increase and the associated expenditure might have to be made.

Debt Repayment Policy

As the fieldwork for this research was being completed in early 1969, the initial three-year asentamiento period was terminating for the first-formed asentamientos. CORA was developing its policy on debt repayment and was assigning land on the oldest asentamientos. The method of debt payment outlined here, which is the basis for the projections made later, is the system CORA intended to use as of that date. Of course, it is possible that on any given asentamiento a slightly different approach will be used, or an entirely new general policy might be established, or the overall legislation framework may be entirely altered. But with the present legislation, some aspects of policy are predetermined.

Assignment of Land

CORA appeared to be planning some form of mixed landholding and operating scheme for most asentamientos. Each beneficiary would receive title to a house, a small tract of land roughly equivalent to his present garden, and perhaps an additional plot in one of the fields. The balance of the land would be assigned to a cooperative composed of all beneficiaries who would be obligated to contribute labor for communal operations. Annual profits would be prorated according to the amount of labor actually contributed during the year. Administrative details were vague and considerable discretion was apparently to be given to the beneficiaries. Transfer of ownership rights, liquidation of a beneficiary's share of the cooperative's capital, and other important operational problems had not been resolved. Although efforts were being made to arrange credit from commercial sources, CORA anticipated that it would have to provide this service and many others for quite some time following termination of the asentamiento.³ A point system for selecting beneficiaries was initiated but it appeared that in practice it would be difficult to deny land to anyone who had been an asentado for the full three years. However, in the case of the first assignments in the over-populated Choapa Valley, CORA assigned land to some of the asentados and encouraged others to relocate on under-populated asentamientos in the south.

Determining the Total Debt

CORA will have to assess each individual beneficiary and/or cooperative for the land. But since the total assessments for all beneficiaries will equal the total farm debt, for purposes of this analysis it is possible to treat the beneficiaries as a group and thus avoid the problem of anticipating the final method used to distribute the land and corresponding debt. In other words, the total value of land, buildings, machinery, etc. will be fixed irrespective of the number of beneficiaries, assuming that existing farm infrastructure is adequate for whatever system of land distribution is chosen. If, however, the asentados insist on individually owned and operated farms, additional costs will be incurred to alter irrigation systems, roads, fences and storage facilities. The current value of infrastructure used in this analysis would then underestimate the actual value at the time of land assignment.

There are several items which must be taken into account if the total debt is to be accurately determined using CORA's method of calculation. They include debts accumulated by the asentados during operation of the asentamiento; the value of land, infrastructure, machinery and livestock to be assigned, and an assessment made by CORA equal to two percent of the total value for the items included in the second category above. The first item--outstanding debts of the asentados--is the

³ Even the newer asentamientos were being encouraged to seek commercial credit because of CORA's financial constraints and its desire to have asentados become familiar with these sources.

one for which policy had not yet been established. Indeed, the entire procedure for liquidating the assets and liabilities of the societies (SARA) upon formation of the cooperative had not been specified. However, since the number of asentados who have accumulated very large debts on asentamientos is likely to be quite small, this item will be ignored here. Furthermore, it is probable that many of these debts will be erased with the justification that they are uncollectible.

The policy on land value is straightforward. CORA planned to use the tax assessed value in effect in the year of the assignment. Any farm structures and improvements not included in this tax value will either be appraised at the time of assignment or the value listed in the original expropriation agreement for the farm will be adjusted to account for inflation. All post-expropriation investments made by CORA will either be appraised or valued by adjusting the actual costs incurred. Likewise, working capital consisting of tools, machinery, and livestock will either be appraised or charged at adjusted book value.

Once all these values have been determined, they will be summed and an additional two percent of the total will be assessed to cover part of CORA's administrative expenses.

Annual Installments for Paying the Assessed Debt

Two separate debt assessments will be made. The first will be for working capital, and the second will cover land, improvements, and the two percent administrative fee. Regarding the land assessment, Law 16,640 states that a cash down payment is required and the balance payable within 30 years after assignment (Article 88). The Law states that the first installment is due at the end of the second agricultural year following allocation of the land, and in special cases it can be deferred until the third year. This initial three-year grace period will probably be applied universally, meaning that the total land assessment minus down payment cannot be divided into more than 28 equal annual installments. To partially compensate for inflation, 70 percent of each installment is adjusted in proportion to the change experienced in the Consumer Price Index between the year of land distribution and payment of the installment. Interest is charged at the rate of three percent annually on each installment plus 50 percent of the adjustment,⁴ except that no interest is charged on the first three installments.

CORA's guidelines recommend that working capital should be completely paid for in five to seven years after acquisition. It is suggested that livestock be paid for in three to four years and machinery in no less than five years. Much of it will have been acquired during the first year or two of the asentamiento and some asentados will have already paid one or two installments out of asentamiento profits. Those that have done so will be in a good position to pay the unpaid balance during the grace period before land installments become due.

4. As in the case of the bonds given to owners of expropriated land, interest is charged on each installment as it becomes due rather than on the unpaid balance. Therefore, three percent annual interest means that interest for the first installment is three percent, six percent for the second, etc.

These regulations and policies determine the maximum amount of time in which the debts are to be paid. Of course, beneficiaries can pay faster if they choose, and in fact, CORA hopes to accelerate repayment by setting debt installments at a level consistent with a farm's projected debt repayment capacity assuming good management.

There is an interesting aspect of this debt repayment procedure which needs to be pointed out as it leads to a simplifying assumption made in subsequent analysis. By applying the procedure to a specific case, it can be shown that under some conditions the real value of payments made by beneficiaries will not equal the initial amount of the debt. For example, if a \$637,500 debt is assumed to be paid with \$12,500 down payment and 25 annual installments of \$25,000 each, with a three-year initial grace period and 20 percent annual inflation, the real value of total payments including adjustments and interest equals just over \$580,000 or approximately 91 percent of the original debt. Furthermore, the deflated value of each annual installment never reaches the \$25,000 amount.⁵ Four factors contribute to this result: there is a grace period before the first installment and interest payment, adjustment is made for less than 100 percent of inflation, the suggested rate of inflation is high (but not unrealistic for Chile), and interest is charged on only one-half of the adjustment.

⁵ The complete repayment schedule can be found in 10, page 78.

Chapter III

Determining the Debt Repayment Capacity of Asentamientos

It is clear from the preceding discussion that the exact post-reform structure and operation of farms cannot be predicted with accuracy. Likewise, government policies can and probably will be altered with concomitant effects on output and profitability. Therefore, to project debt repayment capacity of the Chilean agrarian reform beneficiaries, it was necessary to make several simplifying assumptions about the data and clearly establish the parameters within which the conclusions derived from the data would be valid.

Although debt repayment capacity is an important consideration for reasons indicated above, it cannot be studied in isolation. For example, it would be possible to demonstrate how debt payment could be accomplished by drastically reducing the farm labor force, or greatly increasing farm investment. But these variables are of interest in themselves to both the beneficiaries and the Chilean society. Undoubtedly a country like Chile with large food imports would prefer a system producing the highest gross value of farm output with a reasonable demand for resources. Beneficiaries would prefer to employ a large part, if not all, available family labor rather than discharge excess labor in order to increase debt repayment capacity. Therefore, each farm organization and operation alternative must be evaluated on at least the following variables: debt repayment capacity, farm employment, operating capital requirements, and gross value of farm production.

Analysis of each of these variables presents a series of difficulties but special attention is drawn to gross value of production. This variable is an obvious function of physical production and farm prices. In an absolutely free market system, prices derived from the interaction of supply and effective demand reflect society's preference for products. But in economies such as Chile where prices are altered by governmental agencies with consumer oriented policies, market prices may not reflect true accounting or shadow prices. Wheat is a clear example. Prices of wheat and bread are controlled at a level below that which would prevail in a free market. Subsidized imports help to enforce the established price. A preferred method of analysis would be to impute product prices which more accurately reflect true supply and demand conditions, but such a task is almost impossible, so prices paid are taken at their face value. This simplification tends to undervalue all enterprise mixes with the greatest bias occurring for those combinations with the highest proportion of products having controlled prices.

Data Analysis

The basic requirement of data analysis was that the amortized debts of the reform be compared with projected farm income. In the absence of transfer payments, farm income will determine if beneficiaries attain desired levels of consumption with a sufficient residual left for debt retirement. Theoretically, a family can reduce consumption and thereby increase debt repayment capacity, but obviously there is a minimum subsistence level below which it cannot fall. There is probably another

somewhat higher level of desired consumption which if not attained will force a beneficiary to give up his land and seek a better life in the city. In cooperative production schemes, the members become accustomed to periodical personal withdrawals, and it is even more difficult to restrict consumption because to do so requires group consent. Families could attempt to supplement farm income with non-farm employment, but the Chilean reform aims to create viable farm units so this alternative is ruled out.

Since part, if not all, the reform debt will be assigned to beneficiaries and individuals, the most appropriate method of analysis would project individual families' ability to pay debts. This would require projecting a specific method of land distribution and correlated debt assessment. To avoid this problem, it was decided to treat the asentamiento rather than the family as the basic unit of analysis.

This strategy did not control for the variation in future farm income and expenditures which will surely occur when asentamientos are terminated and beneficiaries exercise more control over the use of farm resources. Production could quickly change when they begin to make decisions about crops, rotations, fertilization, etc., without the firm presence of CORA. Therefore, it seemed logical to project two possibilities: one in which future farm operations continue much as they are now, and the second when they approach management levels of efficient private farms. Of course it is possible that farm efficiency could decline below present levels but even a government unsympathetic to reform would probably be forced to undertake programs and policies which would maintain beneficiary income at some minimal level.

Farm operations following reform will change both in terms of the management of individual enterprises and the combination of enterprises. By focusing on enterprises, it was possible to determine how various combinations would affect farm income, output, employment, and operating capital requirements. Therefore, to evaluate debt repayment capacity from both present and future income, three steps were required in the analysis of each asentamiento:

1. Enterprise budgets had to be prepared for the asentamientos' actual operations in 1966/67 and 1967/68. Budgets also had to be prepared for each enterprise to provide input-output coefficients for expected results obtainable with improved management.
2. Using the coefficients developed in the budgets, an optimum combination of enterprises was determined by a linear programming model which maximized net farm income subject to various constraints.
3. The present and optimum enterprise combinations were compared using the four criteria selected for the study.

Enterprise Budgets

The enterprise budgets had to be prepared in such a way so as to facilitate the comparison of present and improved management, and provide input data for linear programming. The general format chosen is presented in Table 1. The first two columns report the respective items as they were calculated from the asentamiento data. The input-output coefficients represent as accurate an estimate as possible of the labor and fertilizer used per hectare of crop enterprise and the resulting yield. Enterprise gross returns include cash sales, the imputed value of production consumed by the asentados, and any unsold inventory remaining from the year's production. Increases in the inventory value of livestock were included in the gross returns for livestock enterprises.

Enterprise cash expenses include the usual items of seed, fertilizer, and chemicals which are fairly easily distributed among enterprises, but also an effort was made to assign machinery operating costs. These included rental fees, annual assessments made by CORA for the use of its machinery, and operating costs including fuels, lubricants, and repairs. When specific costs such as harvesting could be associated with a single enterprise, they were assigned to it. But most general expenditures had to be allocated as an average cost per hectare for the entire farm or proportionately to each enterprise depending on the relative use of mechanization. Home grown feeds were charged to the livestock enterprises at the cost of production.

Enterprise net returns were calculated by deducting cash expenses from gross returns. They represent the amount the enterprise contributes to paying the farm's wage costs; indirect cash expenses such as taxes, electricity, water rights, and general repairs; and returns to asentado labor, capital and management.

The third or "Budget" column lists the same type of information, assuming improved management, and as such is considerably more subjective than the other two columns. Several sources of information were used in deriving the data for this budget. First, the two years' performance of the asentamiento was helpful. Secondly, for each asentamiento CORA officials estimated input requirements and corresponding yields for the important enterprises, assuming good management and the use of recommended techniques and levels of fertilization. Thirdly, input-output coefficients were derived for the paired private farms where they had the same enterprises. Fourthly, a farm survey of the physical inputs actually used in enterprises in Chile in 1961/62 is available (4). Except for some notable exceptions, asentamientos currently use less fertilizer and more labor, and had lower yields and net returns than reported by the other sources. If the data from the other sources were quite varied, intermediate values were chosen for the budget.

A rule was adopted to choose input values at high levels and yields at less than maximum in order to derive conservative estimates of potential net returns. Thus, the income projections obtained from the linear programs which used these budgeted coefficients should be realistic within the parameters established for the analysis.

Table 1. SAMPLE OF ENTERPRISE BUDGETS USED IN STUDY

Enterprise Budget

Asentamiento

	Actual		Budget
	1966/67	1967/68	

Kilos or man-day per ha.

Input-output coefficients:

Yields

Annual labor use

Fertilizers

Escudos per ha.

Gross returns

Cash expenses

Seed

Fertilizer

Chemicals

Machinery

Other

Net returns

An important consideration in determining the optimum combination of enterprises is that of relative product prices. Farm level prices in any one year may be distorted because of unusual supply and demand conditions or government price policies. To compensate for this problem, published price series for the recent past were compared with the prices reportedly received by both private farm and asentamientos. Adjustments were made to obtain a "Budget" price which seemed consistent with past relative prices. Such adjustments were usually small because the prices of many important products are controlled, and are increased annually by a similar coefficient to compensate for inflation. Similar adjustments were made for the prices of fertilizer, the only input for which reliable published price data were available.

Farm Returns

The enterprise budgets provide a convenient method of calculating net farm returns. The farm level concepts are defined in the following way:

Gross farm returns = sum of individual enterprise gross returns plus miscellaneous items such as firewood sales and pasture rental.

Cash farm expenses = sum of individual enterprise cash expenses.

Net farm returns = gross farm returns minus cash farm expenses.

Thus net farm returns represent that portion of gross farm returns which remains for fixed costs, wages for hired labor, and returns to asentado labor, capital and management.

Debt repayment capacity is easily calculated after net farm returns have been determined. The scheme of analysis is as follows:

Net farm returns	E ^o
less labor payments	E ^o _____
equals net farm income	E ^o
less fixed costs	E ^o _____
yields returns to capital and management	E ^o

Labor payments are considered a cost to the firm and include wages paid to hired labor and advances made to asentados for work directly related to crop and livestock production. Fixed costs also include some labor payments--namely, the wages and advances paid for general farm work such as cleaning irrigation canals, repairing buildings and fences, and caring for work animals and machinery. Other cash expenses such as taxes, water rights and bookkeeping services complete the category of fixed costs. The balance--returns to capital and management--is the amount available for maintenance of the capital stock, for covering the opportunity cost of invested capital, for new investment, for improving consumption (through increased payments to labor), and for debt repayment.

It should be recognized that this model determines debt repayment capacity in a manner quite distinct from normal family farm analysis. The end-of-year cash balance is generally used to measure debt repayment capacity of a family. It is assumed that high priority will be given to paying a debt installment and consumption will be adjusted accordingly. But in a cooperative form of organization, it is likely that past labor payments derived from the farm will become institutionalized as the minimum level of consumption demanded by the members; therefore, labor payments have prior claim on farm income before debt payment. In addition, the members may decide that part of the returns to capital and management should also be distributed for consumptive purposes so not even all of that category would be available for debt repayment.

Fixed costs must be deducted before debt installments can be paid. The reason for including some labor payments in fixed costs is related to the projections which follow. It is assumed that fixed costs, including the labor portion, will remain relatively unchanged irrespective of the enterprise mix selected and the amount of labor that it requires. That is, canals will need to be cleaned, fences and buildings repaired, and animals cared for regardless of the nature of other farm operations. Therefore, this labor requirement is kept separate from other farm activities.

Inflation must be accounted for when returns, expenses or income between two time periods are compared. Since the balance sheets for the asentamientos from which the basic data were derived correspond to the period May through April, any values for 1966/67 which are compared with those of 1967/68 are adjusted upwards by the inflation registered in the Consumer Price Index from May 1 to April 30. In April 1967 the Index was 715.8 (1958 = 100) and by May 1968 it had increased by 25.6 percent to 898.7. Thus, 1966/67 values are increased 25.6 percent for comparison with 1967/68. There is an obvious limitation in using this index since the relationship between farm level and consumer prices varies from year to year and product to product. However the CPI is the most widely accepted single series available and is used to adjust public and private sector wages, savings deposits, bonds paid to landowners and the CORA debt.

Linear Programming

The system of enterprise budgets as outlined above is suitable for evaluating the efficiency of existing enterprises, and could be used in a linear programming model for a family farm where labor is assumed to have no opportunity cost. But it must be modified for use on large farms of the type considered here where labor costs are variable. Theoretically, the number of families could be increased or decreased, and wage labor could be hired or dismissed, in accord with the needs of the enterprise combination chosen. Therefore, to maximize profits through an optimum combination of enterprises, the quantity and cost of labor per unit of enterprise had to be determined in addition to enterprise net returns. Since it was argued that past labor payments have become

accepted as a minimum for consumption, the wage rate used in the program was derived from a weighted average of 1967/68 payments. Specifically:

$$\text{wage rate} = \frac{\text{Total cost of wage labor + total advances to asentados}}{\text{Total number of days worked by asentados and wage laborers}}$$

Thus, the net income derived from any enterprise can be determined by subtracting the labor cost from enterprise net returns. Maximizing net farm income becomes the objective function for linear programming.

Several restrictions were placed on all programs to make them as realistic as possible and consistent with recommendations made by CORA agronomists. Total tillable land for each farm was fixed at present levels. Rotations were limited to four to six successive annual crops followed by forage. Rice is grown for a maximum of two years, then followed by a year of forage for moisture and weed control. Cattle were introduced to graze forage crops, except where the selling of hay is widely practiced. The total number of hectares devoted to a single crop was restricted because of market limitations, disease problems, or to avoid some of the risks, uncertainties, and problems of labor management inherent in specialization.

Three basic production alternatives were used to project debt repayment capacity of the farms, and the four criteria--farm income, farm emplagment, gross value of output, and operating capital requirements--were analysed for each.

Alternative A predicts farm income based on asentamiento's results in 1966/67 and 1967/68. Using such a basis for prediction assumes that future farm organization, relative prices, yields, output mix, input costs and productivity will remain relatively unchanged.

Alternative B incorporates improvements in farm management represented by the increased use of purchased inputs, higher yields, and general efficiency in resource use. It predicts farm income if: a) the budgeted input-output relationships are achieved for the enterprises, and b) an optimum combination of enterprises is selected to maximize net farm income. The enterprises permitted to enter the solution were restricted to those traditionally found on the farm, plus forages to complete recommended rotations and cattle to consume them. Complete specialization was not permitted but some of the least profitable enterprises were discontinued. Orchards and vineyards were not permitted to exceed present size. Increases in operating capital were limited to the purchase of seed, fertilizer, chemicals, and livestock, the value of which would be recovered from the year's production. No long-term capital investments were programmed for land, buildings, breeding herds, or orchards and vineyards. No specific type of farm organization was assumed, except that for the results to be valid, the budgeted input-output coefficients and programmed output mix must obtain.

The total amount of labor, including both asentados and hired workers, was not restricted the first time Alternative B was programmed because the objective was to determine maximum net farm income and associated labor requirements when enterprises were selected solely on the criteria of highest per hectare net income. In all cases, the resulting optimum required substantially less labor than presently employed on the asentamientos. Therefore, surplus labor was defined as the difference between the amount presently used and the amount required by the optimum output mix. Then an attempt was made to force more labor-intensive enterprises into the solution by charging for this surplus labor. This approach met with limited success because the labor-intensive enterprises tended to have the highest net income per unit of land, and thus, were already in the solution up to the maximum permitted by some constraint.

One methodological problem regarding labor requirements must be pointed out. Throughout the study, labor is calculated as total man-days per year. Obviously the seasonal nature of much farm work could result in temporary labor shortages if the asentamiento work force was reduced to the number of workers just able to provide the required labor by working full-time throughout the year. If sufficient data were available, a preferred procedure would be to program peak monthly labor requirements by enterprise subject to a maximum monthly labor constraint. However, two factors tend to mitigate against any errors or biases introduced by using this simplified methodology. First, at this stage of Chile's development, the number of landless laborers is so high as to facilitate hiring occasional labor. Secondly, each alternative includes several thousand man-days for general farm work not associated with specific crop or livestock enterprises. Much of this work could be planned for slack seasons, thereby freeing the entire work force for peak labor requirements.

The third alternative, C, attempts to deal with both the debt repayment and labor problems by increasing investment in existing or new labor-intensive enterprises. For each asentamiento an enterprise was selected which appeared to have good market potential and was known to respond well to similar soil, water, and climatic conditions. They tended to be fruit or nut crops as they use larger amounts of labor than most field crops and have fairly good long-run demand prospects, particularly in foreign markets. However, there are limitations to the quantity of product that can be absorbed in the short-run, and complete specialization by a few properties could saturate the market. Since this study intends to demonstrate realistic alternatives for the entire reform program, expansion of production on any one farm had to be restricted.

One of the problems of projecting future income from these types of capital investments is the irregularity in income and expense over time. For example, an orchard requires considerable initial investment followed by several years of maintenance before any income is received. Physical production begins slowly, reaches a peak, then declines. Therefore net income is first negative, then becomes positive and increases to a maximum, and finally begins to fall. The technique used in this analysis to account for this variation was a discounted cash flow method which derives

an annual equivalent cash flow.¹ The annual income and expense during the life of an investment was estimated, then discounted at the rate of eight percent and summed, to provide the total net present value of the investment. This total was converted to an annual equivalent cash flow which if received and discounted annually over the same time period would generate the same net present value. This annual equivalent is the income coefficient for the linear program. Eight percent was used as the discount rate because it was assumed that low-income farm workers would require a rate higher than the guaranteed six percent available in savings institutions for them to invest. Likewise if CORA was to provide loan funds for farm investment borrowed from international sources, it would have to cope with rising interest rates, often approaching eight percent. The effect of such a high rate was to discourage all but the most profitable investments implying that CORA might have to provide subsidized credit for some types of investments.

Determination of total asentamiento debt followed as closely as possible the method CORA anticipated using as outlined in the previous chapter. Land values were obtained from tax assessments. The value of farm structures, improvements, orchards, and vineyards was taken from the farm appraisal made at the time of expropriation and adjusted to 1968 values using the Consumer Price Index. The actual cost of infrastructure investments made by CORA was adjusted the same way. To calculate working capital debt, the book value of tools, machinery, and livestock appearing in the asentamiento operating statement was adjusted by the Price Index to 1968 values. Two percent of the total outstanding debt was added to the land debt to cover CORA's fee.

Converting these debts to yearly installments posed some problems because the policy is variable for working capital, and as was noted above, the real value of total debt payments will differ from the actual debt depending on how interest is charged, how adjustments are made for inflation, and the actual rate of inflation. To simplify this issue, it was decided to divide the working capital and land debts into 5 and 30 equal installments, respectively. This implies that the real value of total payments exactly equals the total debt but no interest is charged. By using the 30-year period, the annual land installments are as small as possible if repayment is to be accomplished within the term set by the law. It is hoped that the debt installments calculated in this way would approximate the real value of installments actually charged in a less-than-30-year plan but for which the effects of inflation are not fully adjusted.

After the annual installments had been calculated, they were compared with returns to capital and management for Alternatives A, B, and C to evaluate the possibilities for debt payment. If the returns to capital and management exceeded the debt installments, the income derived from the alternative was sufficient to pay debts, at least in the short-run. However, this type of financial analysis gives high priority to debt repayment, while a standard economic analysis would first deduct an item like depreciation on invested capital. This omission in a financial analysis

1. This technique is described in (1) and (2).

implies that at some future date a considerable financial outlay will be required to replace worn-out capital. Therefore, returns to capital and management should exceed debt installments at least by an amount equal to depreciation if the long-run viability of the firm is to be maintained. Moreover, this residual should be large enough to permit future capital investment besides permitting increases in consumption by the beneficiaries. Some economic analyses would also deduct the opportunity cost of invested capital. However, from society's point of view there is little if any alternative use for capital already invested in long-term investments such as farmland and buildings.

Chapter IV

Debt Repayment Capacity of Six Asentamientos

The results of the data analysis for the six asentamientos are presented below. They are ranked from highest to lowest in debt repayment capacity based on present income. Each is briefly described but they are designated with numerals rather than their official names to preserve a degree of anonymity. It was not feasible to reproduce here the more than 60 enterprise budgets prepared in the original research; the interested reader is invited to consult the original manuscript cited as (10).

Case I

Description

Asentamiento I is a showcase for the reform, and is an example of a well-run asentamiento. Production was high before expropriation and subsequently has increased. Yields are respectable, operating costs have been controlled, and farm income is high. Soils on the 300-plus irrigated hectares are variable; the low-lying land is used for annual crops while the foothills are kept in continuous alfalfa. Unirrigated pasture is available for grazing 50 to 60 head of cattle for two months in late spring. Located only two hours north of Santiago by truck, the farm has good access to the Santiago market as well as regional markets in Los Andes and San Felipe. Crops mature early because of the warm climate. Producers of horticultural crops have a slight edge by having their products reach the markets early in the harvest season. Several large fruit farms are located nearby and some export a portion of production. Growing conditions also favor raising alfalfa for sale as meal or hay.

The farm traditionally has had several enterprises; some like tobacco, hemp and broom corn are specific to this region. Since domestic demand is limited and production fluctuates widely from year to year, specialization in any one is avoided. An adequate supply of irrigation water has been a consistent problem. During the 1968/69 drought, several fields were left uncultivated because of water shortage. CORA was constructing a holding reservoir to accumulate the night flow of irrigation water which currently is poorly used or entirely lost. This should assure a reliable supply except in years of severe drought.

CORA has also made other investments in the asentamiento including the building of storage facilities and new houses for all asentados. A 37 hectare plantation of peaches and walnuts has been established. The Community of asentados purchased a Hereford cow herd with CORA's financial assistance, but considering cattle prices relative to the value of alfalfa consumed, it would seem to be a questionable investment. Machinery was late in arriving the first year so some custom hiring was required. Inexperienced machine operators have contributed to expensive maintenance costs.

The 51 asentados are hard working and have assumed most of the management responsibilities. An additional 10 to 15 workers, most of them relatives of asentados, are employed and receive daily wages. Their work-days are credited to their respective asentado families and thereby increase the asentado's share of year-end profits. Teenage family members are employed for light work in tobacco fields. Except for approximately 25 hectares in garden plots, all land has been farmed through communal operations. The garden plots are intensively cultivated and some families have marketed part of the produce. All families have a few head of livestock and some poultry. The asentamiento's coordinator lives in a neighboring town, and after the first year he was able to spend the majority of his time working with other asentamientos. Part of the first two years' operating profits were used to cancel two of five working capital debt installments.

Results in 1966/67 and 1967/68

This asentamiento had ten different enterprises in 1966/67 and added barley, peaches and walnuts in 1967/68 (Table 2). The latter two, of course, are in the process of formation and required only irrigation and pruning after being planted. Wheat and corn were the two most important crops both years in terms of total area, but the industrial crops of hemp, broom corn and tobacco yielded higher net returns per hectare. Potatoes were grown for consumption by asentados. Clover was introduced as an experiment but proved inferior to alfalfa and was going to be plowed under in the 1968/69 crop year. Besides the 37.0 hectares for the plantation, another 21 hectares were absorbed the second year for construction of houses and reservoir.

In spite of this decrease in harvested hectares, gross farm returns increased the second year from almost E° 627,000 to E° 667,000, an increase of 6.5 percent (Table 3). At the same time, expenses declined over 40 percent from E° 212,000 to E° 127,000. A large proportion of this reduction was due to lower machinery expenses. Total labor payments were relatively equal for the two years, fixed costs increased 2.5 times, and the returns to capital and management rose from almost E° 233,000 to over E° 287,000. The increase in fixed costs was partly due to the large number of man-days used in housing construction.

The total debt and the annual installments required to cancel it within the prescribed time periods are given in Table 4. Because the asentados already paid two installments of the working capital debt, the unpaid balance is divided into three installments of E° 56,000 apiece. The land debt is almost 2.5 million escudos with 42 percent of it attributed to investments made by CORA after expropriation. Annual installments of over E° 82,000 are required to cancel the land debt and CORA's fee. Thus for the first three years after land assignment, beneficiaries would need to pay a total of almost E° 139,000 per year in debt payments. Once the working capital debt is paid, only the land installment would remain for the last 27 years.

Table 2.

ASENTAMIENTO I, ENTERPRISE COMBINATIONS
1966/67 and 1967/68, Alternatives B and C

Enterprise Combination	Alternative A		Alternative B				Alternative C	
	1966/67	1967/68	With Livestock		Without Livestock		Non-Use of Labor Charged	
			E ^o 0/day	E ^o 10.50/day	E ^o 0/day	E ^o 10.50/day	E ^o 0/day	E ^o 10.50/day
	NUMBER OF HECTARES							
Alfalfa: Total	71.0 ^{a/}	41.5	167.6	152.0	167.6	150.9	139.6	135.1
Rotation A			132.0	116.4	132.0	115.3	104.0	99.5
Rotation B			35.6	35.6	35.6	35.6	35.6	35.6
Wheat: Total	91.5	84.5	41.9	38.0	41.9	37.7	34.9	33.8
Rotation A			33.0	29.1	33.0	28.8	26.0	24.9
Rotation B			8.9	8.9	8.9	8.9	8.9	8.9
Hemp	30.0	14.0	20.0	20.0	20.0	20.0	20.0	20.0
Broom Corn	15.0	10.0	15.0	15.0	15.0	15.0	15.0	15.0
Tobacco	33.0	22.0	0	19.5	0	20.9	0	5.6
Peaches and Walnuts	0	37.0	37.0	37.0	37.0	37.0	72.0	72.0
Corn	79.5	44.0						
Clover	4.5	4.5						
Potatoes	3.0	2.0						
Horticultural Crops	2.0	4.0 ^{b/}						
Barley	0	22.0						
Beef Cattle (head)	103	103	100	100	0	0		
Total hectares	307.5	281.5	281.5	281.5	281.5	281.5	281.5	281.5

a/ 31.0 hectares established, 18.0 new seeding, 22.0 one cutting only.

b/ Not included in total due to double cropping.

Table 3. **ASENTAMIENTO I: RETURNS TO CAPITAL AND MANAGEMENT**
CHILE, 1966/67 and 1967/68

Item	Years:		Percent Change 1966/67 to 1967/68
	1966/67 ^{a/}	1967/68	
	1968 Escudos		
Gross farm returns	626,808	667,249	+ 6.5
Cash farm expenses	212,435	126,959	- 40.2
Net farm returns	414,373	540,289	+ 30.4
Labor payments	133,331	132,161	- 0.9
Net farm income	281,042	408,128	+ 45.2
Fixed costs	48,287	120,440	+149.4
Returns to capital and management	232,755	287,688	+ 23.6

^{a/} The actual values for 1966/67 have been increased by 25.6 percent to account for inflation.

Table 4. ASENTAMIENTO I: TOTAL DEBT AND ANNUAL INSTALLMENTS
CHILE, 1968

Item	Amount in 1968 Escudos		
<u>DEBT:</u>			
Working capital debt:			
Tools and machinery	140,444.16		
Livestock	<u>125,644.02</u>		
Total working capital debt	266,088.28		
Less payments	<u>96,763.11</u>		
Balance		169,325.17	
Land debt:			
Land	1,320,388.00		
Improvements	76,868.53		
CORA's investments	<u>1,019,257.78</u>		
Total land debt		2,416,514.31	
CORA fee (2 percent of working capital and land debt)		<u>51,716.79</u>	
		2,637,556.27	
Item	Total debt	Installments	
		First 3 Yrs.	Last 27 Yrs.
<u>INSTALLMENTS:</u>			
Working capital debt	169,325.17	56,441.72	--
Land debt	2,468,231.10	82,274.37	82,274.37
Total	2,637,556.27	138,716.09	82,274.37

Compared with returns to capital and management obtained in both 1966/67 and 1967/68, these debt installments could be paid and still leave a substantial residual (Table 5). The minimum residual would be E° 94,000 during the first three years of payment under the profitability of 1966/67, and the maximum would be over E° 205,000 for the last 27 years with returns to capital and management equal to those of 1967/68.

These values do not take into account the future costs and returns from peaches and walnuts which will begin bearing in 5-6 years. Calculations in the original manuscript demonstrated that net farm income could increase by E° 150,000 when these trees are in full production.

Alternative B

Clearly this asentamiento is in good financial position with respect to debt installments. Even if future profitability does not improve over present levels, debt repayment could be easily accomplished. It will be shown later that other asentamientos do not have this same payment capacity from present farm income and methods must be found to increase their income. Alternatives B and C offer some possibilities.

Alternative B maximizes net farm income through a linear program solution using the technical coefficients derived in the enterprise budgets. Constraints were placed on the program in recognition of production and marketing limitations. First, the tillable land was divided into two classes, A and B, with a separate rotation established for each. Class A land including the lowland has little restriction in its usage; a nine year rotation consisting of four years of alfalfa, four of cultivated crops, and one year of wheat associated with alfalfa was introduced. The foothills were included in rotation B consisting of four years of alfalfa and a year of wheat due to poorer quality soil. Hemp, broom corn and tobacco were restricted to 20, 15, and 25 hectares respectively, amounts consistent with the quantities grown the past two years. Melons were limited to 10 hectares and the beef herd was maintained at a 100 cow level. Thirty-five hectares of good alfalfa pasture were allocated for maintenance of the calves and cows. Peaches were continued at the 37 hectare level. The daily wage rate was set at E° 10.50, equal to 1967/68 per day labor payments, but the total amount of labor used was not constrained.

The optimum combination of enterprises obtained from this program is shown in Table 2, column 3. Hemp and broom corn are at maximum levels, and alfalfa, the crop with the next highest net income per hectare after deducting labor costs, absorbs the remaining hectares. Wheat enters the solution because of its role as a cover crop for alfalfa. Net farm returns with this alternative rise to E° 637,000 compared to E° 414,000 in 1966/67 and E° 540,000 in 1967/68 (Table 5).

But in this solution, the amount of labor directly required for the crop and livestock enterprises is only 10,861 man-days compared to 13,840 actually used on the asentamiento in 1967/68. Therefore, part of the gain in net farm income is at the expense of farm employment.

Table 5. ASENTAMIENTO I: RESIDUAL
CHILE, 1966/67 and 1967/68

Item	Years			
	1966/67		1967/68	
	First 3 Years	Last 27 Years	First 3 Years	Last 27 Years
	1968 Escudos			
Returns to capital and management	232,755	232,755	287,688	287,688
Debt installments	138,716	82,274	138,716	82,274
Residual	94,039	150,481	148,972	205,414

To test the possibility of absorbing labor by shifting to more labor-intensive enterprises, a charge of E° 10.50 (the wage rate) was assessed against surplus labor (i.e., 13,840 minus 10,861 man-days). In effect, this established a fixed labor cost of E° 145,320. Table 2, column 4 gives the results. Tobacco enters the solution at a level of 19.5 hectares, and alfalfa and wheat drop accordingly. Net farm returns increase but net farm income declines because of the increase in labor payments. All 13,840 man-days of labor are now utilized. Labor is used most profitably in alfalfa and wheat, but when surplus labor is charged, it is preferable to bring in tobacco to effectively employ all the labor rather than pay additional labor payments and retain the previous enterprise mix.

The shift to tobacco could have been predicted by comparing per hectare labor requirements and net returns of tobacco versus a rotation of four years of alfalfa and one year of wheat. The respective coefficients were:

	<u>Alfalfa and Wheat</u>	<u>Tobacco</u>
Man-days per hectare	22	175
Net returns	E° 2,269	E° 3,423
Less labor payments (E° 10.50 per man-day)	231	1,837
Net income	E° 2,038	E° 1,586

With no minimum restriction on labor use, the program will select the alfalfa and wheat combination as it has highest net income per hectare. The minimum charge for non-use of labor which will cause tobacco to substitute for alfalfa and wheat can be calculated with the formula:

$$w = \frac{R_1 - R_2}{L_2 - L_1}$$

where:

w = non-use charge where solution is indifferent between selecting enterprises 1 or 2,

R₁ = net income of the most profitable, least labor-intensive enterprise,

R₂ = net income of the least profitable, most labor-intensive enterprise,

L₁ = labor use in enterprise 1, and

L₂ = labor use in enterprise 2.

Thus in this case:

$$w = \frac{E^0 2.038 - 1.586}{175 - 22} = E^0 2.95$$

Any charge against the non-use of labor exceeding E⁰ 2.95 will bring tobacco into the solution. The quantity of hectares substituted depends, of course, on the total labor constraint selected. In this case, 2,979 man-days were left unemployed in the first solution, each hectare of tobacco employs 153 more man-days than a hectare of the alfalfa/wheat combination, so 19.5 hectares of tobacco are sufficient to employ all surplus labor. However, if the surplus would have been sufficiently large, tobacco would have reached its constraint of 25 hectares without providing sufficient employment. Then it is possible to determine what non-use charge would have been required to bring in other labor-intensive enterprises. Melons and corn would have entered the solution with charges exceeding E⁰ 14.14 and E⁰ 23.61, respectively.

Both of these programs have assumed the continuation of the cow herd as an enterprise even though it appears to be a poor investment because of the high returns obtainable from the sale of alfalfa hay rather than using it for pasture. When this enterprise is permitted to leave the solution, the optimum enterprise mixes shown in Columns 5 and 6, Table 2 are obtained. When non-use of labor is not charged, the alfalfa is sold as hay, net farm income increases to E⁰ 602,000, but labor use drops to 10,641 man-days (Table 6). Charging for the non-use of labor brings in tobacco at a level of 20.9 hectares, net farm income almost reaches E⁰ 593,000 and all labor is employed. By dropping the cow herd, the working capital debt would also be reduced, but this factor is ignored in subsequent analysis.

Alternative C

Employment opportunities on this farm could be profitably expanded beyond present levels with further capital investments. One alternative has already been suggested by CORA's establishment of the plantation. Only 13 percent of tillable land is currently devoted to the plantation, and even though there are marketing uncertainties with this enterprise, it would not seem unreasonable to increase peach production to, say, 25 percent of total area by the addition of another 35 hectares. Sufficient land is available with soil and water conditions similar to the present orchard and most of the necessary machinery has already been purchased.

Analyzing long-term investments, such as a peach orchard with high initial costs followed by increasing, then decreasing net income, is facilitated by a discounted cash flow procedure. Annual cash flows can be converted into equal annual equivalents for comparison with potential income from other sources. The technique involves the construction of cash flows for the life of the orchard, discounting them by a selected interest rate,

TABLE 6.

ASENTAMIENTO I: COMPARATIVE RESULTS FOR ALTERNATIVES A, B AND C
CHILE, 1968

Item	Alternative A		Alternative B				Alternative C	
	1966/67	1967/68	With Livestock		Without Livestock		Non-use of Labor Charged	
			E° 0/day	E° 10.50/day	E° 0/day	E° 10.50/day	E° 0/day	E° 10.50/day
	1968 Escudos							
Net farm returns	414,373	540,289	637,208	659,699	713,883	738,035	721,744	728,245
Labor payments	133,331	132,161	114,039	145,320	111,729	145,320	136,279	145,320
Net farm income	281,042	408,128	523,169	514,379	602,154	592,715	585,465	582,925
Fixed costs	48,287	120,440	92,000 ^a	92,000	92,000	92,000	92,000	92,000
Returns to capital and management	232,755	287,688	431,169	422,379	510,154	500,715	493,465	490,925
Debt installment:								
First 3 years	138,716	138,716	138,716	138,716	138,716	138,716	138,716	138,716
Last 27 years	82,274	82,274	82,274	82,274	82,274	82,274	82,274	82,274
Residual:								
First 3 years	94,039	148,972	292,453	283,663	371,438	361,999	354,749	352,209
Last 27 years	150,481	205,414	348,895	340,105	427,880	418,441	411,191	408,651
Labor use ^b	18,558	18,036	14,861	17,840	14,641	17,840	16,979	17,840
Operating capital required	345,765	259,120	360,585	393,469	355,775	392,087	384,041	393,546
Gross value of prod.	626,808	667,248	791,721	815,819	865,896	891,774	877,481	884,446

^aE° 50,000 plus 4,000 man-days at E° 10.50 per man-day.

^bThe values given for Alternatives B and C include 4,000 man-days needed for general farm work. Therefore, the amount required for the respective enterprise combinations is 4,000 less than these amounts.

summing to obtain the present value of discounted future income, and converting this sum to an annual equivalent. The annual equivalent cash income and expense, and average number of man-days of labor required per year are then used as coefficients in the linear program.

Table 2, columns 7 and 8, gives the results for this program. The additional 35 hectares of peaches displace 28 hectares of alfalfa and 7 hectares of wheat. Net farm income reaches E° 585,000 and 12,979 man-days of labor are required. When surplus labor is charged, tobacco comes back into the solution and all surplus labor is used.

Comparison of the Three Alternatives

The merits of these various programs can be seen in Table 5. Although debt repayment capacity could be obtained with present farm income, several improvements in farm management are evident. In Alternative B the improvement is limited to better management and an optimum enterprise combination, while Alternative C includes an investment in 35 additional hectares of peaches. Both these alternatives increase gross value of farm production, but also increase farm operating capital requirements which would have to be supplied by CORA initially, and perhaps by the beneficiaries themselves at a later date when they save part of earned income. In both alternatives labor use falls below present levels unless surplus labor is charged the same rate required labor.

Case II

Description

Asentamiento II, a farm of almost 300 tillable hectares located south of Curico, has a long history of grape growing and wine processing. Much of the vineyard is 30 years old and had been allowed to deteriorate prior to expropriation. Likewise, the wine press and storage facilities were in poor repair so the first objective of CORA has been renovation of the entire growing and processing operation. Large doses of fertilizer have been applied to the aging vines, and improved systems of pruning have been introduced. As a result, wine production increased from 6,000 liters per hectare of grapes in 1966/67 to 7,800 in 1967/68.

Under the previous owner, most of the remaining farm land was uncultivated because it is not particularly fertile, and the water table is close to the surface in some fields. Since wine sales provided a good income and other crops did not produce well, the owner permitted his workers to cultivate some land for their personal use and left the balance in natural pasture for the horses used in the vineyard. CORA encouraged the asentados to plant some of this land but crops have not done well on it, and it is now concluded that some fields should remain in pasture unless properly drained.

The response of the asentados, the majority of whom have resided on the farm for several years, has been interesting. With their long experience in wine-making, they have shown little enthusiasm for experimenting with new crops and learning related production practices. Most prefer to work with grapes and leave a few others to supervise hired labor utilized in the new activities. These new crops might have performed better with the same careful attention given grapes.

Excessive amounts of wage labor have been a problem. The number of asentados was increased from 31 in 1966/67 to 40 in 1967/68 but they still furnish less than half the total man-days worked. However, they now resist accepting additional families knowing farm income would have to be divided among more people. Each month, 40 to 50 full-time wage laborers are hired and the number can go as high as 100 during grape harvest. A serious effort was made in 1967/68 to discharge surplus workers, but a political issue developed when they refused to leave, and they were employed an additional few months before the matter was resolved.

To encourage the substitution of family for hired labor, the asentados abandoned communal operation of the vineyard in 1968/69 and assigned portions of it to individual asentados. Past production records were used to delineate areas of approximately equal yield potential. Each family was to provide the labor required for its respective area. If labor was hired, the cost would be charged to the respective asentado's account along with all other purchased inputs. All such costs would be deducted from the value of his production. A standard production plan was to be adopted, and if anyone failed to apply the appropriate fertilizers or insecticides, labor would be hired to perform the task and automatically charged to the laggard individual. Unfortunately, a late spring frost destroyed 30 to 40 percent of the crop so the experiment had to be abandoned.

Besides investments made in the wine-making enterprise, CORA invested in housing so most asentados live in new or repaired houses. However, some new dwellings stand vacant because the intended residents refuse to occupy them. The asentados have paid no installments on the working capital debt, but as individuals they have acquired horses and miscellaneous equipment.

Of the six asentamientos studied, this one was closest to terminating the asentamiento period and the logical topic of conversation was the method for final land assignment. CORA proposed individual assignment of homes, garden plots, and the majority of land not in grapes. The vineyard would be assigned to a cooperative in which all asentados would be members. This plan may have had less than wholehearted support because surveyor stakes placed at the proposed boundaries were removed one night by unidentified persons. Interviews with asentados revealed that the president's failure to fully communicate the results of negotiations with CORA contributed to a state of confusion and apprehension.

An asentado who previously served on the farm's administrative staff has been elected president all three years of the asentamiento's operation. Two other former staff members also occupied formal leadership positions. All three admitted to receiving lower incomes after the reform while most other asentados reported increases. This may explain why they seemed to

be the most adamant advocates of individual ownership, including the vineyard. The expectation of receiving individual tracts of land may have been their reason for staying on the asentamiento. Being more aggressive than the others, individual ownership might permit them to progress faster than would be possible in a cooperative.

Results in 1966/67 and 1967/68

The asentamiento had six enterprises in 1966/67 and added watermelons and assorted vegetables in 1967/68 (Table 7). Barley was increased the second year as wetter fields were brought into cultivation. However, results were disappointing because the average yield declined from 2,200 to 800 kilos per hectare. The area devoted to corn was decreased but yields more than doubled. Sugar beet production per hectare also doubled but the number of hectares was greatly reduced the second year. The vineyard occupied 132 hectares the first year, and an additional three hectares was planted. In 1967/68, the asentamiento purchased grapes from a nearby farm to expand the wine-processing activity. Natural pasture declined by 10 hectares the second year and the total tillable area was reduced because of new house sites.

With all these adjustments from 1966/67 to 1967/68, gross farm returns increased by almost 39 percent (Table 8) from E° 846,000 to E° 1,174,000. But cash farm expenses rose over 163 percent so net farm returns increased only four percent to E° 690,000. Labor payments and fixed costs also increased and returns to capital and management actually declined by 20 percent.

The increase in fixed costs largely resulted from a change in book-keeping system. In 1966/67, small tools and miscellaneous hardware items were charged to long-term debts. Subsequently, it was decided that such items should be considered operating costs so all purchases, losses, and depreciation for two years were charged to 1967/68.

Table 9 gives the total asentamiento debt converted to annual installments. Since no installments had been paid on the working capital debt, payments of E° 20,500 each would be required for five years after land assignment. The land debt totals E° 1,763,000, of which 20 percent corresponds to long-term investments made by CORA. Installments of almost E° 59,000 would be required to pay the land debt within 30 years.

Like Asentamiento I, this asentamiento can pay projected debt installments out of present net farm income and still leave a sizable residual (Table 10). Net farm income will increase slightly when the three hectares of recently planted grapes come into production, but this could be offset by renovation of other old sections of vineyard. In fact given the advanced age of the vineyard, it might be necessary to accelerate the replanting program thereby reducing present income.

Table 7.

ASENTAMIENTO II: ENTERPRISE COMBINATIONS
1966/67 and 1967/68, Alternatives B and C

Enterprise Combination	Alternative A		Alternative B		Alternative C	
	1966/67	1967/68	Non-use of Labor Charged		Non-use of Labor Charged	
			E ^o 0/day	E ^o 15.90/day	E ^o 0/day	E ^o 15.90/day
	Number of Hectares					
Rotation A:						
Wheat			12.7	12.7	7.7	7.7
Clover			25.3	25.3	15.3	15.3
Potatoes	6.5	9.1	3.0	3.0	23.0	23.0
Sugar beets	41.1	14.1	35.0	35.0		
Rotation B:						
Wheat			19.0	19.0	19.0	19.0
Clover			19.0	19.0	19.0	19.0
Rotation C:						
Wheat			6.0	6.0	6.0	6.0
Clover			24.0	24.0	24.0	24.0
Vineyard	132.0	135.0	135.0	135.0	165.0	165.0
Beef Cattle (head)			129	129	99	99
Barley	23.7	61.8				
Corn	46.8	25.0				
Beans	10.6	14.1				
Watermelon and other horticultural crops		5.2				
Natural pasture	25.1	15.0				
Total Hectares	285.8	279.3	279.0	279.0	279.0	279.0

Table 8. ASENTAMIENTO II: RETURNS TO CAPITAL AND MANAGEMENT
CHILE, 1966/67 and 1967/68

Item	Years		Percent Change 1966/67 to 1967/68
	1966/67 ^{a/}	1967/68	
	1968 Escudos		
Gross farm returns	845,940	1,173,687	+ 38.7
Cash farm expenses	183,766	483,854	+ 163.3
Net farm returns	662,174	689,832	+ 4.2
Labor payments	400,091	423,552	+ 5.9
Net farm income	262,083	266,280	+ 1.6
Fixed costs	109,756	145,343	+ 32.4
Returns to capital and management	152,327	120,937	- 20.4

a/ The actual values for 1966/67 have been increased by 25.6 percent to account for inflation.

Table 7.

ASENTAMIENTO II: ENTERPRISE COMBINATIONS
1966/67 and 1967/68, Alternatives B and C

Enterprise Combination	Alternative A		Alternative B		Alternative C	
	1966/67	1967/68	Non-use of Labor Charged		Non-use of Labor Charged	
			E° 0/day	E° 15.90/day	E° 0/day	E° 15.90/day
Number of Hectares						
Rotation A:						
Wheat			12.7	12.7	7.7	7.7
Clover			25.3	25.3	15.3	15.3
Potatoes	6.5	9.1	3.0	3.0	23.0	23.0
Sugar beets	41.1	14.1	35.0	35.0		
Rotation B:						
Wheat			19.0	19.0	19.0	19.0
Clover			19.0	19.0	19.0	19.0
Rotation C:						
Wheat			6.0	6.0	6.0	6.0
Clover			24.0	24.0	24.0	24.0
Vineyard	132.0	135.0	135.0	135.0	165.0	165.0
Beef Cattle (head)			129	129	99	99
Barley	23.7	61.8				
Corn	46.8	25.0				
Beans	10.6	14.1				
Watermelon and other horticultural crops		5.2				
Natural pasture	25.1	15.0				
Total Hectares	285.8	279.3	279.0	279.0	279.0	279.0

Table 10:

ASENTAMIENTO II: RESIDUAL
CHILE, 1966/67 and 1967/68

Item	Years			
	1966/67		1967/68	
	First 5 Years	Last 25 Years	First 5 Years	Last 25 Years
	1968 Escudos			
Returns to capital and management	152,327	152,327	120,937	120,937
Debt installments	79,275	58,783	79,275	58,783
Residual	73,052	93,544	41,662	62,154

surplus labor is charged E° 15.90, the output mix is unaffected and net farm income declines by the amount paid unused labor. Therefore, net income falls from E° 474,000 to E° 398,000 (Table 11). The burden of increasing employment opportunities rests with Alternative C.

Alternative C

The logical labor-intensive enterprise to consider expanding is the vineyard. New plantings have been prohibited in the past, but the agrarian reform law provides exemptions for certain groups including agrarian reform cooperatives. The chief limitation on this asentamiento is the quality of soil. Only class A land is suited for vineyard. To protect against uncontrollable risks such as frosts, presumably a portion of this land will be retained in crops like sugar beets to provide cash income and employment when a grape crop fails. Therefore, an expansion of 30 hectares in vineyard was projected. The annual cash flow equivalent for the discounted net cash income derived from a 40-year production cycle of grapes was calculated to be E° 3,288 with an average yearly labor requirement of 111 man-days. This enterprise is similar in net returns and labor use to sugar beets but the latter are part of a rotation with other lower income crops, so the average return for the rotation is less.

When this 30 hectare increase in vineyard was permitted the results in Table 7, column 5 were obtained. The vineyard increased 30 hectares, sugar beets dropped to 23 hectares and potatoes were eliminated. Pasture is available for only 99 head of cattle. Once again, charging non-use of labor at E° 15.90 per man-day caused no change in the enterprise combination because the relationship between sugar beets and potatoes did not change. Net farm income increased to E° 490,000 and E° 438,000 for the respective solutions (Table 11). The labor problem is not completely solved as the expanded vineyard increases labor requirements by only 1,500 man-days. Roughly 13 percent of the average amount of labor employed in 1966/67 and 1967/68 would still be surplus.

Comparison of the Three Alternatives

A comparison of the three alternatives can be made by reviewing Table 11. Either of the B or C alternatives is considerably superior to 1966/67 and 1967/68 in net farm income and gross value of production. Returns to capital and management are almost twice present levels implying that debt repayment would be much easier to accomplish while leaving a substantial residual for increased consumption and investment. These alternatives require larger amounts of operating capital than used in 1966/67 but less than used in 1967/68.

One limitation of these alternatives is that they do not budget renovation costs for the vineyard. Production for the next few years could reach projected levels without renovation, but the advanced age of the vines will ultimately result in reduced yields. If high yields are to be maintained in the long-run, a systematic program of replanting will be required which will temporarily reduce harvested area.

Alternative B

Alternative B evaluates the potential increases in net farm income which could be obtained on this asentamiento through improved management and an optimum enterprise mix. Almost one-half of total tillable hectares will undoubtedly be retained in vineyard because of its high net income per hectare and the existence of adequate wine-making facilities. Therefore, any alternative designed to increase net farm income is limited to improving efficiency in the wine-making enterprise, and seeking the optimum enterprise mix for the remaining land. Moreover, the enterprise budget for the vineyard suggests the asentamiento is already using acceptable management for this activity.

There are changes in other enterprises, however, which are suggested by linear programming. Several constraints were required to make the program as realistic as possible. First, the variable soil conditions were accounted for by establishing three classes of land and rotations. Class A land of about 76 hectares has relatively little restriction in use, and a rotation of wheat or barley, two years of clover, and three years of cultivated crops was envisioned. A rotation of two years of wheat or barley followed by two years of clover was established for approximately 38 hectares of poor, partly wet class B land. Class C land of approximately 30 hectares is very wet and is restricted to permanent clover and grass pasture reseeded every five years with wheat or barley as a cover crop. The following restrictions were placed on the respective crops to avoid overspecialization: potatoes, 10 hectares; sugar beets, 35 hectares; and melons, 10 hectares. The vineyard was continued at its present 135 hectare level. Feeder cattle were introduced to consume the pasture. Consistent with normal grazing practice, it was assumed that class A and B pasture would support 2.5 head per hectare and class C pasture two head. Thirty animal units of pasture were deducted for maintenance of horses used in cultivation of the vineyard. The wage rate was set at E^o 15.90, equal to average per day labor payments of hired and asentado labor in 1967/68.

Table 7, column 3, gives the resulting optimum enterprise combination. Sugar beets are at the maximum of 35 hectares and potatoes occupy the remaining three hectares not required for wheat or clover by the rotations. There is sufficient pasture for 129 head of cattle. Net farm income associated with this alternative is E^o 474,000 compared to E^o 262,000 in 1966/67 and E^o 266,000 in 1967/68 (Table 11).

Once again, part of this gain in net farm income is at the expense of employment. Whereas 24,900 and 26,700 man-days were directly assignable to 1966/67 and 1967/68 crop production, Alternative B requires only 21,000 man-days. But unlike Asentamiento I, charging non-use of labor at the wage rate does not alter the solution, because potatoes, the one crop which utilizes more labor than sugar beets, will not increase in area until the labor non-use charge exceeds E^o 18.46. When the total labor constraint is set at 25,800 (the average amount of labor used the previous two years) and

TABLE 11.

ASENTAMIENTO II: COMPARATIVE RESULTS OF ALTERNATIVES A, B, AND C
CHILE, 1968

Item	Alternative A		Alternative B		Alternative C	
	1966/67	1967/68	Non-use of Labor Charged		Non-use of Labor Charged	
			E ^o 0/day	E ^o 15.90/day	E ^o 0/day	E ^c 15.90/day
	1968 Escudos					
Net farm returns	662,174	689,832	808,172	808,172	848,119	848,119
Labor payments	400,091	423,552	334,329	410,220	357,861	410,220
Net farm income	262,083	266,280	473,843	397,952	490,258	437,899
Fixed costs	109,756	145,343	120,650 ^a	120,650	120,650	120,650
Returns to capital and management	152,327	120,937	353,193	277,302	369,608	317,249
Debt installment						
First 5 years	79,275	79,275	79,275	79,275	79,275	79,275
Last 25 years	58,783	58,783	58,783	58,783	58,783	58,783
Residual						
First 5 years	73,052	41,662	273,918	198,027	290,333	237,974
Last 25 years	93,544	62,154	294,410	218,519	310,825	258,466
Labor use ^b	28,638	30,803	24,527	24,527	26,007	26,007
Operating capital required	693,612	1,052,750	702,257	778,148	705,612	757,971
Gross value of production	845,940	956,698	997,475	997,475	1,029,499	1,029,499

^aE^o 65,000 plus 3,500 man-days at E^o 15.90 per man-day.

^bThe values given for Alternatives B and C include 3,500 man-days needed for general farm work. Therefore, the amount required for the respective enterprise combinations is 3,500 less than these amounts.

None of these alternatives utilize all present labor; productive employment for all existing workers will require additional adjustments. Planting the remaining 36 hectares of class A land to grapes would employ another 1,800 man-days per year. Labor intensive horticultural crops might be grown but marketing problems would have to be overcome. Other new enterprises might be introduced. Beet tops might be a relatively inexpensive supplement to existing pasture. The asentamiento is only three kilometers from a paved highway and has access to both the Talca and Curico markets, so dairying might be feasible but a major limitation is the lack of existing facilities. An investment in barns, corrals, milk house, and equipment would have to be made, in addition to purchasing the dairy herd. Inexperienced asentados would be a major limitation for any of these new enterprises, but unless one is adopted, this farm cannot efficiently utilize all the present labor force, much less provide employment for the maturing children of asentado families.

Case III

Description

Asentamiento III is a farm with 330 tillable hectares, of which 80 are devoted to vineyard. It is located 70 kilometers west of San Fernando in a valley well known for excellent grape-producing soil and climatic conditions. The asentamiento's wine storage and processing facilities exceed current production because they were built when the farm was part of a larger unit. Like Asentamiento II, the vineyard and wine-making facilities were run-down so CORA has made large investments in renovation. Much of the vineyard is old and needs to be replanted if production is to be maintained at high levels.

Although wine-making has been the most important single enterprise, wheat, corn, and beans have always been grown in varying amounts on the fertile cropland. Orange, avocado and lemon groves are numerous in the valley; this farm has 4.5 hectares of oranges, part of which is approaching peak production. In addition to irrigated land, the farm has over 600 hectares of rough land which provides poor quality pasture. It now serves as a source of firewood and occasional grazing for the asentados' personal livestock. Except for approximately 25 hectares in garden plots, all land is communally operated.

The total farm work force has declined from 100 to 110 workers five years ago to 45 asentados plus 40 permanent full-time hired laborers at present. Additional help is contracted for the grape harvest. Apparently no attempts have been made to increase the asentado population. Discharging excess laborers would be especially difficult because all but two are relatives of asentados.

Several new houses were constructed for workers just prior to expropriation, and CORA is building additional units. Their location has been debated by CORA and the asentados. Having become accustomed to their quiet, shady surroundings in an isolated wooded area of the farm, some asentados resist moving to the new clustered housing constructed in an open field adjacent to a public road. CORA's reasoning is that this is the rational way for services like water and electricity to be provided.

A coordinator actively participated in managing the farm during the first year. Thereafter, the asentados became more independent although the coordinator continued to reside nearby. In spite of this freedom, the asentados have not developed sound leadership strength. An ex-administrator of the farm became an asentado and was elected president the first and third years of operation. In compliance with CORA's policy of rotating leadership, a new man was elected the second year, but he occupied only a figurehead position. The president owns a general store, a truck for transporting purchases, and a small tract of land from which he obtains a rental income. Because of his many interests and superior status, he never engages in field work. Indeed, if he was forced to perform manual labor like other asentados, he would probably leave the asentamiento.

This situation poses a dilemma for land assignment because such an individual would likely dominate a cooperative or communal operation, thus violating the egalitarian concepts reform planners espouse. But if given a separate tract of land, he would undoubtedly hire labor for the farm work while he managed his several interests. This demonstrates the difficulty of creating a system which stimulates capable and aggressive people to advance but restricts them from engaging in supposedly anti-social behavior.

Results in 1966/67 and 1967/68

Barley occupied the largest number of hectares in 1966/67 (Table 12), but was eliminated the next year in favor of wheat. Corn was grown on 88 hectares in 1966/67, but this was reduced to 28 in 1967/68. Yields were 25 percent lower the first year because improper adjustment of the corn planter resulted in a low plant population. Approximately 25 hectares of beans were grown both years while potatoes were increased from 12 to 45 hectares. The expectation was that the latter would be profitable and employ considerable labor, but yields have not reached potential. Clover was planted the second year and 16 head of beef cattle were added.

Gross farm returns actually declined from E° 824,000 in 1966/67 to E° 756,000 in 1967/68 (Table 13). One of the important causes was the low return from 52 hectares of clover. Sixteen beef cattle could hardly consume the available roughage so apparently the asentados benefited by having good pasture for their personal stock.

Cash farm expenses increased 13 percent from E° 165,000 to E° 186,000. Almost 6,000 additional man-days of labor were employed the second year so payments to labor increased by 10 percent in spite of lower real wages. This combination of lower gross farm returns, and higher expenses reduced net farm income from E° 376,000 to E° 257,000. Fixed costs also rose so the net effect was a reduction in returns to capital and management of more than 56 percent.

The total debts of the asentamiento amount to 2.7 million escudos, 10 percent of which is working capital (Table 14). No payments have been made so installments of almost E° 55,000 would be required to pay the working capital debt in five years. Annual installments of E° 82,000 would pay the land debt in 30 years. Therefore, total payments of E° 137,000 would be required the first five years, followed by E° 82,000 per year for 25 years.

Table 12. ASENTAMIENTO III: ENTERPRISE COMBINATIONS
CHILE, 1966/67 AND 1967/68, ALTERNATIVES B AND C

Enterprise Combination	Alternative A		Alternative B		Alternative C	
	1966/67	1967/68	Non-use of labor charged		Non-use of labor charged	
			E° 0/day	E° 15.30/day	E° 0/day	E° 15.30/day
	Number of hectares					
Wheat	0	70	30	30	27.1	27.1
Corn	88	28	120	94	108.6	88.3
Potatoes	12	45		26		20.3
Glover	0	52	60	60	54.3	54.3
Vineyard	80	80	80	80	80	80
Cranges	4.5	4.5	4.5	4.5	24.5	24.5
Beef cattle (head)		16	135	135	121	121
Beans	25	24				
Barley	94					
Natural pasture	4	4				
Total hectares	307.5	307.5	294.5	294.5	294.5	294.5

Table 13. ASENTAMIENTO III:
RETURNS TO CAPITAL AND MANAGEMENT
CHILE, 1966/67 AND 1967/68

Item	Years		Percent change 1966/67 to 1967/68
	1966/67 ^{a/}	1967/68	
	1968 Escudos		
Gross farm returns	824,118	755,504	+ 8.3
Cash farm expenses	164,531	186,138	+ 13.1
Net farm returns	659,587	569,366	- 13.7
Labor payments	284,071	312,629	+ 10.1
Net farm income	375,516	256,737	- 31.4
Fixed costs	113,708	140,911	+ 23.9
Returns to capital and management	261,808	115,826	- 56.8

^{a/} The actual values for 1966/67 have been increased by 25.6 percent to account for inflation.

Table 14. ASENTAMIENTO III: TOTAL DEBT AND ANNUAL INSTALLMENTS CHILE, 1968

Item	Amount in 1968 Escudos
DEBT:	
Working capital debt:	
1. Tools and machinery	260,176.39
2. Livestock	13,382.76
Total working capital debt	274,009.15
3. Less payments	0
4. Balance	274,009.15
Land debt:	
5. Land	923,120.00
6. Improvements	1,250,810.20
7. CORA's investments	243,970.81
Total land debt	2,417,901.01
CORA fee (2-percent of working capital and land debt)	53,838.20
Total debt	2,745,748.36

Item	Total debt	Installments	
		First 5 Yrs.	Last 25 Yrs.
INSTALLMENTS:			
Working capital debt	274,009.15	54,801.83	--
Land debt	2,471,739.21	82,391.30	82,391.30
Total	2,745,748.36	137,193.13	82,391.30

The debt payments during the first five years would create payment problems with returns to capital and management equal to 1967/68. Those returns fall E° 21,000 short of covering both land and working capital installments (Table 15). However, the residual is E° 125,000 and E° 179,000 for the first five years and last 25 years, respectively, with returns to capital and management equal to 1966/67. The obvious conclusion is that the superior efficiencies and returns obtained in 1966/67 are necessary if debt repayment is to be achieved. Moreover, additional income must be generated to renovate the vineyard, maintain existing capital, make new investments, and raise consumption levels.

Alternative B

For programming Alternative B, it was assumed that at least in the short-run both the vineyard and orange grove would be continued at present levels as they employ considerable labor and yield the highest net returns per hectare. After the new house sites are deducted, there remain approximately 210 hectares to be programmed for annual crops. Irrigation water is available in sufficient quantity and the soil is well suited for several crops, except for one stony field with shallow topsoil. A rotation recommended for the farm included wheat or barley, two years of clover, and four years of cultivated crops. Potatoes were restricted to 45 hectares assuming they would not be repeated more than two years in succession and would never be grown in the poorer field. Beans were limited to 25 hectares because difficulty was encountered in disposing of past production. Pasture rental and beef cattle were introduced as alternative uses of clover. Fifteen animal units of pasture were reserved for horses used in the vineyard. Labor payments were set at E° 15.30 per man-day, the average daily rate for hired and asentado labor in 1967/68. No constraint was placed on the total amount of labor used.

The results of this program are listed in Column 3, Table 12. Corn becomes the major crop with 120 hectares. Clover and wheat complete the rotation and sufficient pasture is available for 135 head of beef cattle. Projected net farm income rises to E° 549,000 compared to E° 376,000 in 1966/67 and E° 257,000 in 1967/68 (Table 16). Returns to capital and management rise accordingly, and a residual after debt payment of E° 194,000 the first five years and E° 248,000 the last 25 years is obtained.

The labor requirement for this enterprise combination and estimated general farm work is 18,840 man-days, similar to 18,900 man-days used in 1966/67 but almost 6,000 less than used in 1967/68. To force labor useage up to the average employed during these two years, non-use of labor was charged the wage rate of E° 15.30 per man-day. This constraint altered the enterprise mix as shown in Column 4 of Table 12. Potatoes enter the solution at a level of 26 hectares and corn falls by the same amount. Net farm returns increase just enough to cover additional labor payments, so net farm income, returns to capital and management and the residual after debt repayment all remain relatively unchanged (Table 16).

Table 15. **ASENTAMIENTO III: RESIDUAL**
CHILE, 1966/67 and 1967/68

Item	Years			
	1966/67		1967/68	
	First 5 Years	Last 25 Years	First 5 Years	Last 25 Years
	1968 Escudos			
Returns to capital and management	261,808	261,808	115,826	115,826
Debt installments	137,193	82,391	137,193	82,391
Residual	124,615	179,417	-21,367	33,435

TABLE 16.

ASENTAMIENTO III: COMPARATIVE RESULTS OF ALTERNATIVES A, B, AND C
CHILE, 1968

Item	Alternative A		Alternative B		Alternative C	
	1966/67	1967/68	Non-use of Labor Charged		Non-use of Labor Charged	
			E° 0/day	E° 15.30/day	E° 0/day	E° 15.30/day
	1968 Escudos					
Net farm returns	659,587	569,366	708,875	740,647	771,724	796,489
Labor payments	284,071	312,629	250,002	281,826	257,040	281,826
Net farm income	375,516	256,737	458,873	458,821	514,684	514,663
Fixed costs	113,708	140,911	128,050 ^a	128,050	128,050	128,050
Returns to capital and management	261,808	115,826	330,823	330,771	386,634	386,613
Debt installment						
First 5 years	137,193	137,193	137,193	137,193	137,193	137,193
Last 25 years	82,391	82,391	82,391	82,391	82,391	82,391
Residual						
First 5 years	124,615	-21,367	193,630	193,578	249,441	249,420
Last 25 years	179,417	33,435	248,432	248,380	304,243	304,222
Labor use ^b	18,896	24,658	18,840	21,920	20,300	21,920
Operating capital required	562,309	639,679	623,197	679,539	631,246	657,128
Gross value of production	824,119	735,896	893,270	949,560	963,539	1,007,380

^aE° 74,500 plus 3,500 man-days at E° 15.30 per man-day.

^bThe values given for Alternatives B and C include 3,500 man-days needed for general farm work. Therefore, the amount required for the respective enterprise combinations is 3,500 less than these amounts.

Alternative C

Although it has been demonstrated that debt repayment capacity could be attained simply by improving management and selecting an optimum output mix, the asentamiento is in excellent position to expand output even further through capital investment. The vineyard is one obvious alternative since the facilities are already available, and domestic and foreign wine markets could be expanded through an aggressive marketing program. Discounted net returns from new plantings were calculated at approximately E° 3,200 and labor use would average 110 man-days per hectare over the life cycle of the vineyard.

Oranges offer another alternative, and both national and international marketing opportunities are relatively good. Labor requirements average only 56 man-days per hectare but the discounted future returns were calculated at E° 4,600 per year. Thus, 54 man-days more labor are required in vineyard while net returns are E° 1,300 higher for oranges. If surplus labor is paid less than E° 40 per man-day, it would be preferable to grow oranges and pay surplus workers for performing no useful function.

In selecting the restraint for the number of hectares of new oranges to be permitted, it was decided that 20 hectares would be a conservative expansion entirely consistent with production and marketing conditions. With this new alternative, the optimum enterprise combination becomes that shown in Column 5, Table 12. Oranges expand to 24.5 hectares, and wheat, corn, and clover all decline accordingly. Pasture carrying capacity is reduced to 121 head of cattle. Returns to capital and management increase to E° 387,000. Total labor requirements rise to 20,300 man-days, but still 1,600 short of the average amount employed in 1966/67 and 1967/68. When this surplus labor is charged at the rate of E° 15.30 per man-day, 20.3 hectares of potatoes are forced back into the solution. Corn declines by that same amount. Net farm income and returns to capital and management decline slightly, but gross value of production exceeds E° 1,000,000 for the first time (Table 16).

Comparison of the Three Alternatives

The relative merits of these alternatives can be compared by analyzing Table 16. Given the objectives of agrarian reform, Alternative C with non-use of labor penalized would seem to be the best alternative for the farm. Returns to capital and management are close to peak levels, all the labor force is employed, and gross value of production is highest. One of the disadvantages in adopting this alternative is the large amount of operating capital which is required.

These alternatives certainly do not exhaust possibilities for increasing net farm income or farm employment. For example, if potatoes replaced corn in Alternative B to their maximum constraint of 45 hectares, an additional 1,500 man-days of labor would be employed. Net farm income would drop and the operating capital required would increase, but gross value of production would exceed E° 1,000,000. Likewise, it would be possible to expand both oranges and vineyard beyond the levels suggested here. Thus, it can be concluded that although debt repayment would have been a

problem with returns to capital and management equal to 1967/68, opportunities exist for increasing these returns while maintaining the present work force. Employment could even be increased through expansion in oranges or vineyard.

Case IV

Description

This is a cereal producing farm located 30 kilometers north of Santa Cruz. Wheat and rice are the primary crops grown on the 400 tillable hectares; corn, sunflower and beans have often been grown in varying quantities. Approximately 100 hectares of dryland pasture provide limited forage for two to three months a year. There are no permanent plantations like vineyards or orchards. The only buildings besides asentado houses are granaries and a small office.

Much of the heavy soil is poorly drained so 70 to 100 hectares of rice have normally been grown each year. The typical rotation is one or two years of rice followed by a year of fallow for moisture and weed control. Wheat is sown with clover in the fall of the fallow year, and the clover is maintained for two years. Then, one to three years of annual crops will be grown before repeating rice again. Livestock graze the natural grasses that emerge in the fallow land. A neighboring farmer has experimented with seeding clover by airplane in flooded rice fields prior to harvest. His objective is to eliminate the present fallow and wheat system for establishing clover but the results have not been encouraging.

Fifteen hectares of cropland were set aside in 1967/68 to augment the 20 hectares used for family garden plots the previous year. The rest of the land has been farmed communally.

The asentados worked an average of 270-plus man-days both years but accounted for only one-third of total man-days actually used, the rest being furnished by hired labor. The asentado population was increased from 13 in 1966/67 to 20 in 1967/68 but hired labor was also increased by a similar proportion. Almost 900 man-days of hired labor were employed per month in 1967/68. The peak month was June when over 1,100 man-days were hired for general farm work, and shelling the 1966/67 corn harvest. In February, just before the 1967/68 harvest season, a minimum of 650 man-days were hired. CORA has tried to reduce labor hiring but the asentados argue that the agronomists simply do not appreciate the large amount of labor required for a farm of this size. There is no explanation, however, why more labor was used the second year with a less labor-intensive enterprise mix and 15 fewer hectares in communal operations. Since construction activities did not increase, it appears that labor efficiency simply declined.

CORA's investments have been limited to constructing and repairing roads and granaries, and building houses for the new asentados. CORA planned to repair many of the existing houses, but when the asentados learned of the high costs involved, they argued instead for credit so they could make the improvements themselves.

Asentamiento leadership has been provided largely by an asentado who managed crop and livestock activities for the previous owner. He has been elected president all three years of the asentamiento. Although he is customarily seen inspecting and managing farm operations from horseback, he does not appear to hold himself aloof from others.

For unexplained reasons, relations between CORA and the asentados have always been cool and asentados have taken an independent stance in dealings with CORA functionaries. A partial explanation may be that three different Coordinators have been assigned to the asentamiento. Considerable misunderstanding has existed, especially over bookkeeping. In the end of 1968, the present bookkeeper spent time on the asentamiento discussing bookkeeping procedures and this seems to have placated the asentados. Complaints were loudest about the lack of price information, but this may symbolize a basic lack of trust in the system. The asentados felt that they were working very hard without obtaining desired economic results, and possible errors or omissions in accounting offered a convenient scapegoat.

Results in 1966/67 and 1967/68

Over 90 hectares of wheat were grown in both 1966/67 and 1967/68. Rice was a close second with 90 hectares in 1966/67 and over 70 in 1967/68. Corn declined from 61 hectares to 45, and sunflower decreased from 36 to 33. A small amount of beans were grown both years, and potatoes were raised for asentado consumption. Barley was experimented with in 1966/67 but dropped the second year because its returns were inferior to wheat. Clover for pasture was sown at the end of 1966/67 but was used only for the asentados' own livestock after the beef cattle were sold. Ninety hectares were fallowed the first year, and over 60 the second.

Net farm income was only E° 77,000 in 1966/67 but climbed to E° 165,000 in 1967/68 (Table 19). Although gross farm returns were almost identical both years net farm income rose because cash farm expenses dropped by almost 30 percent while labor payments increased only slightly. By increasing yields in 1967/68, gross farm returns were maintained at their previous level even though the area planted to cereals declined. Cash farm expenses per hectare increased in real terms for most enterprises but there were no costs for clover since it was planted in 1966/67, and there were no livestock expenses in 1967/68. The increase in fixed costs was more than offset by increased net farm income, so returns to capital and management rose from E° 28,000 in 1966/67 to E° 98,000 in 1967/68.

The asentamiento's total debt and the installments required to cancel it within the prescribed time period are given in Table 20. Payments of almost E° 31,000 would be required to cancel the working capital debt in five years. Nearly 28 percent of the 1.6 million escudo land debt represents CORA's investments. When CORA's fee of E° 36,000 is included, payments of nearly E° 56,000 are required for cancellation of the land debt in 30 years. During the first five years after debt assignment, total installments would exceed E° 86,000, then drop to E° 56,000 for the last 25 years.

Table 17. ASENTAMIENTO IV, ENTERPRISE COMBINATIONS
1966/67 and 1967/68, ALTERNATIVE B

Enterprise Combination	Alternative A		Alternative B Non-Use of Labor Charged	
	1966/67	1967/68	E° 0/day	E° 13.80/day
	Number of Hectares			
Wheat: total	94.5	94.5	90.8	90.8
Rotation A			18.0	18.0
Rotation B			72.8	72.8
Rice: total	90.0	73.5	108.9	108.9
Rotation A			36.0	36.0
Rotation B			72.9	72.9
Clover: total	0	51.0	108.9	108.9
Rotation A			36.0	36.0
Rotation B			72.9	72.9
Fallow: total	90.0	61.5	54.4	54.4
Rotation A			18.0	18.0
Rotation B			36.4	36.4
Corn	61.1	45.4	16.0	16.0
Potatoes	0.4	1.1	2.0	2.0
Sunflower	36.0	33.0		
Beans	4.5	6.0		
Barley	4.5	0		
Asentado personal use	0	15.0		
Beef cattle (head)	60	0	272	272
Total hectares	381.0	381.0	381.0	381.0

TABLE 18.

ASENTAMIENTO IV, ENTERPRISE COMBINATION
ALTERNATIVE C

Enterprise Combination	One Broiler Unit				Two Broiler Units	
	Corn Produced		Corn Purchased		Corn Purchased	
	Non-use of Labor Charged		Non-use of Labor Charged		Non-use of Labor Charged	
	E° 0/day	E° 13.80/day	E° 0/day	E° 13.80/day	E° 0/day	E° 13.80/day
Hectares						
Rotation A:						
Wheat	18.0	18.0	18.0	18.0	18.0	18.0
Rice	24.3	23.0	36.0	36.0	36.0	36.0
Corn	35.5	35.5	18.0	16.0	18.0	16.0
Potatoes	0	2.0	0	2.0	0	2.0
Clover	36.0	36.0	36.0	36.0	36.0	36.0
Fallow	12.2	11.5	18.0	18.0	18.0	18.0
Rotation B:						
Wheat	72.8	72.8	72.8	72.8	72.8	72.8
Rice	72.9	72.9	72.9	72.9	72.9	72.9
Clover	72.9	72.9	72.9	72.9	72.9	72.9
Fallow	36.4	36.4	36.4	36.4	36.4	36.4
Beef cattle (head)	272	272	272	272	272	272
Corn purchased (kilos)	0	0	96,250	107,250	291,500	302,500
Total hectares	381.0	381.0	381.0	381.0	381.0	381.0

Table 19. ASENTAMIENTO IV: RETURNS TO CAPITAL AND
MANAGEMENT.
CHILE, 1966/67 TO 1967/68

Item	Years		Percent Change 1966/67 to 1967/68
	1966/67 ^{a/}	1967/68	
	1968 Escudos		
Gross farm returns	552,775	555,025	+ 0.4
Cash farm expenses	303,286	214,140	- 29.4
Net farm returns	249,489	340,885	+ 36.6
Labor payments	172,842	175,952	+ 1.8
Net farm income	76,647	164,933	+ 115.2
Fixed costs	48,612	66,739	+ 37.3
Returns to capital and management	28,035	98,194	+ 350.3

a/ The actual values for 1966/67 have been increased by 25.6 percent to account for inflation.

Table 20. CORA ASENTAMIENTO IV: TOTAL DEBT AND ANNUAL INSTALLMENTS CHILE, 1968

Item	Amount in 1968 Escudos		
DEBT:			
Working capital debt:			
Tools and machinery		120,989.19	
Livestock		<u>31,801.22</u>	
Total working capital debt		152,790.41	
Less payments		<u>0</u>	
Balance			152,790.41
Land debt:			
Land		1,062,370.00	
Improvements		124,248.81	
CORA's investments		<u>452,444.48</u>	
Total land debt			1,639,063.29
CORA's fee (2 percent of working capital and land debt)			<u>35,837.07</u>
Total debt			1,827,690.77
	Total Debt	Installments	
		First 5 Yrs.	Last 25 Yrs.
INSTALLMENTS:			
Working capital debt	152,790.41	30,558.08	--
Land debt	1,674,900.36	55,830.01	55,830.01
Total	1,827,690.77	86,388.09	55,830.01

Debt installments of this magnitude could not be fully paid with returns to capital and management equal to 1966/67 (Table 21). However, returns to capital and management in 1967/68 rose sufficiently to provide a residual after debt payment of E° 12,000 during the first five years and E° 42,000 the last 25 years. Clearly this asentamiento needs to increase its income if debts are to be paid. Even returns as high as 1967/68 are insufficient to cover depreciation and permit increased consumption and new investment.

Alternative B

Alternative B increased net farm income through improved management and the selection of an optimum output mix. Two rotations were established to take into account differences in soils and rotations. Rotation A which includes one year of wheat seeded with clover, two years of clover, one or two years of annual crops, one or two years of rice, and a year of fallow, was programmed for 126 hectares of the best land. Rotation B was introduced for the remaining 255 hectares of heavier, wetter land. It is composed of two years of rice, one year of fallow, two years of wheat, and two years of clover. Two projected yield levels were used for wheat and rice. Each hectare of fallow was charged E° 100 for cost of one or two additional plowings. Beef cattle and pasture rental were alternative uses for clover. Potatoes were restricted to two hectares for consumption by the asentados. A maximum of 20 hectares was set for beans due to market limitations. Labor payments were set at E° 13.80 per man-day, the average amount received by asentados and wage labor in 1967/68, but no constraint was placed on total labor use.

The results of this program are given in Column 3, Table 17. Compared to the past two years, this program has slightly more rice, less corn, twice as much clover, and 272 head of livestock to graze the clover pasture. The amount of fallow drops because two crops of rice are always grown before fallowing. Net farm income increases from E° 77,000 in 1966/67 to E° 165,000 in 1967/68 to E° 328,000. Deducting debt installments and fixed costs leaves a residual of E° 165,000 the first 5 years and E° 196,000 the last 25 years.

Once again the problem with Alternative B is surplus labor. This solution requires only 7,751 man-days of labor compared to an average of 12,140 used in 1966/67 and 1967/68. However, charging non-use of labor at the rate of E° 13.80 per man-day does not change the output mix. Potatoes are already the constrained maximum of two hectares; corn and beans are not sufficiently profitable to warrant their substitution for rice. Net farm income decreases by the amount of increase in labor payments to E° 267,000 but is considerably better than 1966/67 and 1967/68 when the same labor force was employed. It can be concluded, therefore, that by improving management and selecting an optimum combination of enterprises, debt repayment can be achieved and a substantial residual remain even when all existing labor is retained.

Table 21. ASENTAMIENTO IV: RESIDUAL
CHILE, 1966/67, and 1967/68

Item	1966/67		1967/68	
	First 5 Years	Last 25 Years	First 5 Years	Last 25 Years
	1968 Escudos			
Returns to capital and management	28,035	28,035	98,194	98,194
Debt installments	86,388	55,830	86,388	55,830
Residual	-58,353	-27,795	11,806	42,364

Alternative C

Unlike the previous three asentamientos, this one has little potential for profitable, labor-intensive enterprises like vineyards or orchards. A soil survey conducted by CORA revealed that ten hectares at most are suited for grapes or fruit trees. Asentado inexperience and the lack of a wine press and storage facilities are additional restrictions.

A more appropriate activity would appear to be some type of livestock in addition to the beef cattle already included in Alternative B. Corn is already included in the previous solution and could serve as the basic ingredient for livestock feed. Poultry raising has had considerable success recently in this region and throughout the country because restrictions have been placed on beef sales to reduce foreign exchange expenditures on meat imports. Poultry offers advantages over pork production as good quality day-old chicks are more readily available than feeder pigs. Broiler operations are generally preferred to egg production as they are simpler to operate and transportation is not as crucial. A cooperatively owned and operated broiler installation has recently been established and already won national awards for feed conversion rates. Although the members are small farmers as inexperienced as most asentados, they were able to rapidly learn good management principles with the help of qualified technical assistance.

A basic broiler unit of the size used by this cooperative was programmed for the asentamiento. Twelve thousand boilers are fed at one time. Seventy days are required for day-old chicks to reach 1.8 kilos, and an additional 21 days are included for cleaning and disinfecting the premises and equipment. Thus four groups can be raised per year. A total of 5.8 kilos of feed are required per bird. This amounts to 48,800 kilos of corn per group of 35.5 hectares of corn for four groups at the budgeted yield for this asentamiento. The remaining 23,000 kilos of feed per group are purchased. Feed grinding and mixing is performed on the farm. An investment in buildings and equipment of almost E° 95,000 is required. Income and expenses projected and discounted for a 20 year period yield an annual equivalent net cash income of E° 126,000. Average labor use over the same time period is 1,104 man-days.

When this enterprise is introduced into the program and it is assumed that all corn is produced on the asentamiento, the results of Column 1, Table 18 are obtained. Rice drops to 24.3 hectares to permit expanding corn to 35.5 hectares, the amount required for the broilers. Potatoes are eliminated. Net farm income increases to E° 346,000 and labor use rises to 12,000 man-days, an increase of 1,250 man-days over Alternative B but still short of the amount used in 1966/67 and 1967/68. By charging non-use of labor, two hectares of potatoes displace rice (Column 2, Table 18), net farm income falls to E° 304,000, and labor use exceeds 12,200 man-days.

By forcing the farm to produce all the corn required by the broiler enterprise, over 11 hectares of rice must be given up. Therefore, it is more profitable to introduce a corn purchasing activity. The purchase price of corn was set at E° 0.45 per kilo compared to a sale price of E° 0.42, the difference covering transportation. This would imply a cost of E° 2,475 for 5,500 kilos otherwise grown on one hectare. Furthermore,

it was assumed that two man-days of labor per 5,500 kilos of corn purchased would be required for transporting it. With corn purchasing permitted, the optimum enterprise combination becomes that of Column 3, Table 18. Corn growing drops from 35.5 to 18 hectares, and 96,000 kilos of corn are purchased. Net farm income rises to E° 353,000, but labor drops to 11,720 man-days. When non-use of labor is charged, potatoes enter the solution at two hectares, net farm income drops to E° 308,000, but now 11,894 man-days are required.

Since all present labor is still not fully employed and broilers are profitable even when fed purchased corn, it is conceivable that a second broiler unit could be added. If the same coefficients are used for a second unit under the unlikely assumption that there would be no economies of scale in operating two units, land use does not change and the entire amount of additional corn is purchased (Column 5, Table 18). However, net farm income increases to E° 375,000 and labor use grows to 12,895 man-days. Charging non-use of labor brings potatoes back into the solution, decreases net farm income but increases labor requirements to just over 13,000 man-days.

Comparison of Three Alternatives

The data in Table 22 permit comparison of the three general alternatives. Present operations of the asentamiento are clearly unacceptable from the debt repayment point of view. Returns to capital and management in 1966/67 would only pay 50 percent of the land payment. Although there was improvement in 1967/68, the residual after debt repayment is small.

Alternative B increases net farm income sufficiently so a residual of over E° 100,000 is available after debt payment when all the current work force is employed even though only 10,750 man-days are actually required. Capital requirements and gross value of production both increase in this alternative. Although not all the present farm labor force is needed for this alternative, it can be retained and paid the present level of labor payments and still meet the debt repayment criterion.

Alternative C introduces broilers to increase net farm income and provide effective employment opportunities for existing labor. The alternative with one broiler unit and all corn produced on the farm is likely to be preferred. A high proportion of the present labor force is actually required, and net farm income is E° 40,000 greater than Alternative B. Operating capital requirements increase E° 250,000 to 300,000 over present levels but gross value of production rises by roughly the same amount.

Another method of resolving both the income and employment issues would be some change in production techniques to increase the number of crops of rice in the rotation, or eliminate fallow, or stretch out the rotation to reduce the relative importance of clover. Therefore, experiments with new techniques such as sowing clover by airplane or transplanting rice could have high returns. This does not deny, of course, that a broiler activity

Table 22.

ASENTAMIENTO IV: COMPARATIVE RESULTS OF ALTERNATIVES A, B, AND C
CHILE, 1968

Item	Alternative A		Alternative B		Alternative C						
	1966/67	1967/68	Non-use of Labor Charged		1 Broiler Unit		2 Broiler Units		2 Broiler Units		
			E° 0/day	E° 13.80/day	Corn Produced	Corn Purchased	Corn Produced	Corn Purchased	Non-use of Labor Charged	Non-use of Labor Charged	
				E° 0/day	E° 13.80/day	E° 0/day	E° 13.80/day	E° 0/day	E° 13.80/day	E° 0/day	E° 13.80/day
	1968 Escudos										
Net farm returns	249,489	340,885	434,938	434,938	469,925	471,721	473,635	475,855	511,917	514,131	
Labor payments	172,842	175,952	106,958	167,532	124,275	167,532	120,330	167,532	136,551	167,532	
Net farm income	76,647	164,933	327,980	267,406	345,650	304,189	353,305	308,323	375,366	346,599	
Fixed costs	48,612	66,739	76,400 ^a	76,400	76,400	76,400	76,400	76,400	76,400	76,400	
Returns to capital and management	28,035	98,194	251,580	191,006	269,250	227,789	276,905	231,923	298,966	270,199	
Debt installment											
First 5 years	86,388	86,388	86,388	86,388	86,388	86,388	86,388	86,388	86,388	86,388	
Last 25 years	55,830	55,830	55,830	55,830	55,830	55,830	55,830	55,830	55,830	55,830	
Residual											
First 5 years	- 58,353	11,806	165,192	104,618	182,862	141,401	190,517	145,535	212,578	183,811	
Last 25 years	- 27,795	42,364	195,750	135,176	213,420	171,959	221,075	176,093	243,136	214,369	
Labor use ^b	12,178	15,546	10,751	10,751	12,005	12,212	11,720	11,894	12,895	13,069	
Operating capital required	524,741	456,832	509,140	569,714	696,118	741,706	731,105	785,087	1,002,292	1,040,059	
Gross value of production	520,526	555,025	643,701	643,701	793,644	797,704	796,444	800,824	953,567	957,947	

^a E° 35,000 plus 3,000 man-days at E° 13.80 per man-day.

^b The values given for Alternatives B and C include 3,000 man-days needed for general farm work. Therefore, the amount required for the respective enterprise combinations is 3,000 less than these amounts.

might still be a worthwhile investment. Labor use could even be increased over present levels. But in the absence of such changes, it does not appear that the entire farm labor force can be effectively employed, much less create additional opportunities for new entrants into the labor market.

Case V

Description

Asentamiento V has problems and possibilities similar to number IV. It is a cereal producing farm located approximately 20 kilometers northwest of Santa Cruz. The 265 tillable hectares are devoted to rice, corn, beans, sunflower, barley and wheat. A typical rotation includes rice, fallow, wheat, clover, and one or two years of other annual crops. Clover is sown with wheat or barley as a cover crop and a seeding is maintained for two to three years. Land along a small stream which is too wet for reliable cropping is used as natural pasture. No attempt has been made to increase its carrying capacity by planting improved grasses. The farm has no unirrigated land, no orchards, or vineyard, and the only buildings are homes and granaries.

This property was a classic example of a poorly managed farm owned by an absentee landlord. It changed hands several times in recent years but none of the owners invested much in it. Buildings were dilapidated and fields were grown over with weeds and brush. Irrigation canals were silted in and lined with brush and small trees. The last owner cropped little of the land; a few workers were employed to look after the livestock that grazed the natural pasture. To improve the productive capacity of the farm, CORA rebuilt roads, cleaned canals and fence lines, constructed a corn crib and granary, and encouraged more intensive land use. New houses have been built for half the asentados.

Although specific data could not be obtained, intensification has apparently increased farm employment over pre-expropriation levels. However, efficient utilization of labor has been a problem. The eight asentados worked an average of more than 270 man-days in 1966/67 but contributed less than 20 percent of total labor employed. Lack of good leadership the first year resulted in considerable waste in the use of hired machinery and labor. The present Coordinator claimed he found laborers sleeping in the fields when he arrived at the end of 1966. In 1967/68 seven asentados were added, and there was a decline in total man-days worked, but asentados still supplied only 40 percent. An average of almost 500 man-days of labor were hired per month. The peak month was May when over 1,100 man-days were hired to harvest the 1966/67 crop of beans and plant wheat for 1967/68. The least amount was hired in September when 350 man-days were used in general farm work prior to spring plowing and planting.

Some of this hired labor was required for making improvements, but this type of work will decline in the future. A potential long-run problem is that a spirit of cooperation and hard work does not seem to have yet

developed among the asentados even though all the land, except for 15 hectares in garden plots, is farmed communally. A work day from 8:00 A.M. to 6:00 P.M. was standard for most of the year. One major weakness is that asentado leadership has been slow to develop. There seems to be no particularly well qualified asentado and no one had any pre-asentamiento administrative experience. The absence of a leader apparently hindered effective organization of the asentamiento during its first months of operation, and even mid-way into the third year, the asentados were still not a cohesive group willing to challenge CORA on such vital concerns as land assignment or operating policy. Most were discouraged with the first two years' experience and desired individual ownership and operation.

This asentamiento demonstrates the importance of getting an asentamiento functioning well soon after its formation. The longer problems are allowed to continue, the more difficult it becomes to resolve them. Now a major effort would be required to change attitudes and expectations. Although over-aggressive leadership by a few asentados creates problems, the absence of someone to motivate the rest is almost more serious.

Results in 1966/67 and 1967/68

Rice was the most important crop in both 1966/67 and 1967/68 with 82 hectares grown the first year and 78 the second (Table 23). Corn was next important with 30 and 32 hectares, but yields have yet to reach 50 percent of their potential. Beans, potatoes and squash were grown for both home consumption and sales. One hundred head of beef cattle were purchased near the end of the 1966/67 agricultural year, and the majority had been sold by April 30, 1968. Both barley and wheat were grown in 1967/68, with the latter producing the highest net returns. One field was set aside the second year to supplement the asentados' garden plots. In both years, 45 to 55 hectares of low land were left in natural pasture.

This is the second asentamiento where gross farm returns declined the second year (Table 24). Yields and gross returns per hectare declined for several crops. However, net farm returns actually increased because cash farm expenses declined almost 37 percent. A large part of the decrease was due to reduced machinery hiring. When labor payments were deducted in 1966/67, net farm income was negative. Since total advances exceeded profit shares, the asentados built up personal debts to CORA. Moreover, CORA had to pay E° 50,000 in fixed costs so total debts of the asentamiento amounted to almost E° 57,000. The situation improved sufficiently in 1967/68 to provide returns to capital and management exceeding E° 40,000.

This asentamiento's total debt is approximately 1.2 million escudos (Table 25). No payments have been made on working capital so the total debt would have to be paid in five installments of E° 23,000 each. Thirty-two percent of the land debt is attributed to post-expropriation investments made by CORA. Installments of nearly E° 37,000 are required for cancellation within 30 years. Therefore, total installments of nearly E° 60,000 would be due the first five years and E° 37,000 the last 25 years.

Table 23.

ASENTAMIENTO V, ENTERPRISE COMBINATIONS
1966/67 and 1967/68, Alternatives B and C

Enterprise Combinations	Alternative A		Alternative B		Alternative C			
	1966/67	1967/68	Non-use of labor charged		One Broiler Unit		Two Broiler Units	
			E° 0/day	E° 16.40/day	E° 0/day	E° 16.40/day	E° 0/day	E° 16.40/day
NUMBER OF HECTARES								
Rice	81.7	77.7	60.0	0	55.2	25.9	31.5	31.5
Corn	29.7	32.1	28.3	86.3	35.5	47.4	71.0	71.0
Wheat: total	0	26.5	38.7	38.7	38.7	38.7	38.7	38.7
Rotation A			29.6	29.6	29.6	29.6	29.6	29.6
Rotation B			9.1	9.1	9.1	9.1	9.1	9.1
Beans	29.8	10.0	0	30.0	0	30.0	0	0
Potatoes	14.0	4.0	0	2.0	0	2.0	0	0
Clover: total	0	6.3	95.5	95.5	95.5	95.5	95.5	95.5
Rotation A				59.1	59.1	59.1	59.1	59.1
Rotation B				36.4	36.4	36.4	36.4	36.4
Sunflower	28.8	0						
Barley	0	16.6						
Squash	1.0	0						
Fallow	13.4	25.2	30.0	0	27.6	13.0	15.8	15.8
Natural Pasture	54.1	46.1						
Asentados' personal use	0	8.0						
'eeef cattle (head)	100	100	221	221	221	221	221	221
Total hectares	252.5	252.5	252.5	252.5	252.5	252.5	252.5	252.5

Table 24.

ASENTAMIENTO V:
RETURNS TO CAPITAL AND MANAGEMENT
CHILE, 1966/67 and 1967/68

25. 10. 67

Item	Years		Percent Change 1966/67 to 1967/68
	1966/67 ^{a/}	1967/68 ^{a/}	
1968 Escudos			
Gross farm returns	515,236	443,788	+ 13.9
Cash farm expenses	333,618	210,303	- 37.0
Net farm returns	181,618	233,485	+ 28.6
Labor payments	188,332	124,961	- 33.6
Net farm income	- 6,714	108,524	+ 1620.0
Fixed costs	50,091	67,882	+ 35.5
Returns to capital and management	- 56,805	40,642	+ 159.6

^{a/} The actual values for 1966/67 have been increased by 25.6 percent to account for inflation.

Table 25. ASENTAMIENTO V: TOTAL DEBT AND ANNUAL INSTALLMENTS CHILE, 1968

Item	Amount in 1968 Escudos		
DEBT:			
Working capital debt:			
Tools and machinery	90,475.40		
Livestock	24,628.63		
Total working capital debt	<u>115,104.40</u>		
Less payments	0		
Balance		115,104.03	
Land debt:			
Land	715,625.00		
Improvements	16,356.66		
CORA's investments	<u>344,064.66</u>		
Total land debt		1,076,046.32	
CORA's fee (2 percent of working capital and land debt)		<u>23,823.00</u>	
Total debt		<u>1,214,973.35</u>	
Item	Total debt	Installments	
		First 5 Yrs.	Last 25 Yrs.
INSTALLMENTS:			
Working capital debt	115,104.03	23,020.81	--
Land debt	1,099,869.32	36,662.31	36,662.31
Total	1,214,973.35	59,683.12	36,662.31

Since returns to capital and management were negative in 1966/67, obviously there was no debt repayment capacity. Even the returns for 1967/68 fall E° 19,000 short of covering both the land and working capital installments (Table 26). Clearly this asentamiento is in financial difficulty when labor payments and fixed costs cannot be paid out of farm income. Considerable additional net farm income must be generated to pay debts, maintain the capital stock and make new investments.

Alternative B

To determine the optimum enterprise mix, rotations were developed in accord with the two general types of growing conditions found on the farm. Rotation A was programmed for approximately 207 hectares best suited to general crops. The rotation included one or two years of rice followed by a year of fallow, one year of wheat, two years of clover, and one or two years of other crops. Rotation B was used for the low, wet land and consisted of one year of wheat, and four years of clover and assorted grasses. Potatoes were limited to 30 hectares for asentado consumption, and beans were restricted to 30 hectares because of market limitations. Beef cattle or pasture rental were introduced as methods of utilizing the clover. In 1967/68, labor payments to hired and asentado labor averaged E° 16.40 per man-day so this quantity was used as the daily wage rate in the program. Total labor use was not constrained.

The optimum enterprise mix for this program appears in Column 3, Table 23. Compared to the past two years, this solution includes no beans or potatoes, more wheat, clover and fallow and slightly less rice and corn. There is sufficient pasture for 221 head of beef cattle. Net farm returns are E° 243,000 compared to E° 182,000 in 1966/67 and E° 233,000 in 1967/68. Deducting labor payments, fixed costs and debt installments leaves a residual of E° 35,000 the first five years and E° 58,000 the last 25 years. However, only 7,300 man-days of labor are employed compared to 11,600 used in 1966/67 and 9,800 in 1967/68.

To derive a solution employing more labor, non-use of labor was charged at E° 16.40 per man-day. Then the optimum output mix becomes that given in Column 4, Table 23. Rice drops out of the solution, corn increases, and beans and potatoes enter at maximum levels. Net farm returns increase while net farm income declines because of the payments for surplus labor. However, this solution still requires only 9,280 man-days.

Alternative C

Expanded potato or bean enterprises could employ all labor, but additional changes are necessary to generate income for future needs of the asentados. Soil conditions are not conducive for fruit or vineyard. The corn already in Alternative B suggests that some type of livestock or poultry enterprise should be considered. A broiler operation is a possibility for reasons similar to those outlined for Asentamiento IV. When one broiler unit of the type used in Asentamiento V is programmed, the results in Column 5, Table 23 are obtained. Just enough corn is grown for

Table 26. ASENTAMIENTO V:
RESIDUAL
CHILE, 1966/67 and 1967/68

Item	Years			
	1966/67		1967/68	
	First 5 Years	Last 25 Years	First 5 Years	Last 25 Years
	1968 Escudos			
Returns to capital and management	- 56,805	- 56,805	40,642	40,642
Debt installments	59,683	36,662	59,683	36,662
Residual	-116,488	- 93,467	- 19,041	3,980

the broilers. Rice occupies 55 hectares, and wheat and clover complete the rotation. Net farm income is E° 25,000 to E° 50,000 greater than Alternative B but labor use still falls 1,000 man-days short of 1967/68 levels. Operating capital requirements and gross value of production both increase. When this alternative is charged E° 16.40 per man-day of nonutilized labor, a new output mix including potatoes and beans is obtained which utilizes 9,670 man-days (Column 6, Table 23).

When a second broiler unit was included, the optimum enterprise combination (Column 7, Table 23) contained 71 hectares of corn, an amount needed for the broilers, and 31.5 hectares of rice. Net farm income rises and the labor requirement of 10,300 man-days surpasses 1967/68 usage. Capital requirements, however, approach the high level of E° 750,000. Since there is no slack labor, charging non-use of labor has no effect on enterprise mix or income.

Comparison of the Three Alternatives

These various proposed alternatives are compared with 1966/67 and 1967/68 in Table 27. All variations of Alternatives B and C are superior in that they permit full debt repayment. However, some require less labor than presently used. By charging non-use of labor, an enterprise mix can be derived for Alternative B which requires 9,280 man-days but the residual after debt payment is small. The same non-use charges change Alternative C to employ all the labor while still producing a substantial residual but operating capital requirements are high. An offsetting benefit is the increase in gross value of production. A second broiler unit increases income, labor use, operating capital requirements, and gross value of production.

Given these considerations, Alternative C with one broiler unit and non-use of labor is probably preferred. The present labor force is employed, there is a fairly substantial residual, required operating capital is similar to present levels and gross value of production is high. The option always exists, of course, of adding a second broiler unit to increase labor use beyond present levels thereby providing employment opportunities for additional landless labor.

Case VI

Description

Asentamiento VI is the type CORA administrators would like to forget. It is poorest of the six in both physical and human resources. It will be shown that part of the labor payments are really a subsidy from CORA rather than earned farm income. The farm has approximately 450 hectares of irrigated land but only 250 are assured of adequate water. Almost 50 hectares of this amount are used as garden plots. There are over 3,000 hectares of low quality dry land pasture in the surrounding hills, capable of supporting only one head of sheep per hectare.

TABLE 27.

ASENTAMIENTO V: COMPARATIVE RESULTS OF ALTERNATIVES A, B, AND C
CHILE, 1968

Item	Alternative A		Alternative B		Alternative C			
	1966/67	1967/68	Non-use of Labor Charged		One Broiler Unit		Two Broiler Units	
			E° 0/day	E° 16.40/day	Non-use of Labor Charged		Non-use of Labor Charged	
					E° 0/day	E° 16.40/day	E° 0/day	E° 16.40/day
					1968 Escudos			
Net farm returns	181,618	233,485	242,732	257,597	287,683	297,327	335,840	335,840
Labor payments	188,332	124,961	87,059	125,788	107,334	125,788	136,113	136,113
Net farm income	-6,714	108,524	155,673	131,809	180,349	171,539	199,727	199,727
Fixed costs	50,091	67,882	60,800 ^a	60,800	60,800	60,800	60,800	60,800
Returns to capital and management	-56,805	30,642	94,873	71,009	119,549	110,739	138,927	138,927
Debt installment								
First 5 years	59,683	59,683	59,683	59,683	59,683	59,683	59,683	59,683
Last 25 years	36,662	36,662	36,662	36,662	36,662	36,662	36,662	36,662
Residual								
First 5 years	-116,488	-19,041	35,190	11,326	59,866	51,056	79,244	79,244
Last 25 years	-93,467	3,980	58,211	34,347	82,887	74,077	102,265	102,265
Labor use ^b	11,660	9,805	7,308	9,278	8,545	9,670	10,300	10,300
Operating capital required	572,040	403,146	352,399	418,742	542,165	573,028	749,769	749,769
Gross value of production	424,169	353,139	350,976	390,456	511,057	531,645	682,735	682,735

^aE° 28,000 plus 2,000 man-days at E° 16.40 per man-day.

^bThe values for Alternatives B and C include 2,000 man-days needed for general farm work. Therefore, the amount required for the respective enterprise combinations is 2,000 less than these amounts.

At one time, this farm had a large number of sheep and cattle. Either due to lack of interest or low income, previous owners had allowed the buildings, corrals, and silos to deteriorate so today they are worthless. Few investments had been made, and at the time of expropriation some workers still lived in adobe houses with thatched roofs. CORA has improved the housing by building inexpensive but adequate houses and by providing building materials to asentados who choose to make their own repairs. A well has been repaired which provides irrigation water for 25 to 30 hectares, and almond trees have been planted on 7.5 hectares.

In addition to 85 asentados, the farm employs 40 hired laborers who are related to or depend upon asentados for their maintenance. They receive a daily wage and their work days are credited to their respective family.

This large number of asentados and the peculiar configuration of the property make for difficult communication. It is a long, narrow farm with the irrigated land straddling an irrigation canal. Houses are dispersed along four to five kilometers of access road, half of which is impassable for motorized traffic during winter. Transportation to Melipilla, the major marketing center 25 kilometers to the north, is available by bus on a paved road which cuts the property in two. The region is sparsely populated and is not often visited by the steady stream of peddlers found elsewhere in the Chilean countryside.

Relative isolation and limited formal schooling may have protected the asentados from some modernizing influences. It appeared, for example, that there had been less than normal emigration from the farm. Several unmarried brothers and sisters continue to reside together after the death of their parents rather than leave or marry and start families of their own.

A contributing factor may have been the method of operating the farm prior to expropriation. Much of the tillable land was sharecropped by individual families. Only the sheep enterprise was owned and operated by the owner using labor required in the rental agreements. With at least limited access to land, families may have been able to employ children that normally would have been denied employment under other types of farm operation.

A similar system of operation has been carried over into the asentamiento. Each family has the standard garden plot. Wheat, alfalfa, and sheep are communal enterprises managed like those on the other five asentamientos, but corn and potatoes are grown on individual plots. Two or three asentados may share labor but harvests are kept separate. CORA charges for seed and fertilizer advances plus a rental fee equal to 10 percent of gross production. Some asentados choose to use their own seed and apply no fertilizer. In 1966/67, many asentados consumed or sold their production and failed to reimburse CORA for advances. Since profits from communal operations were insufficient to cover these advances, large debts were carried over into 1967/68. This problem was ameliorated the second year because CORA acted as intermediary for asentados with potato production contracts from the government purchasing agency (ECA) and, thus, had direct access to cash receipts.

The asentados claimed that as many as a dozen additional workers were employed after formation of the asentamiento. Part of the increase may be due to the introduction of a charcoal production enterprise. Evaluating present labor use is complicated because of incomplete records. By using estimates made by the Coordinator, the total number of work days for communal operations was distributed among the various enterprises. The resulting labor coefficients are far in excess of those for other asentamientos. By assuming that all asentados were employed approximately 270 days per year, estimates were made of labor used in individual operations, and these also seemed high. Since production techniques were in no way unusual, it must be concluded that labor efficiency is extremely low. This should not be a surprising conclusion. With a long history of overpopulation, there was probably little concern for efficient labor use. If pre-reform incomes were as low as reported by asentados, these inefficiencies may not have been critical for owner-operated enterprises. Furthermore, using family labor on rented land probably did little to encourage labor-saving practices in the absence of alternative employment opportunities.

At the termination of data collection, plans were being made for final land assignment. One plan discussed in CORA involved organizing an overall administrative cooperative with a neighboring asentamiento and creating four or five smaller production cooperatives, each responsible for one enterprise. It is far from clear how this form of organization would solve their common basic problem of excess population for existing employment opportunities.

Results in 1966/67 and 1967/68

Most of the communally operated land was planted with wheat in both 1966/67 and 1967/68 (Table 28). Twenty-two hectares of barley were added the second year. The beginning inventory of sheep for each year increased from 950 head to 1,150. Charcoal production was significant but more than 50 percent of it had to be stored when demand declined because of relatively mild winters and rapid adoption of gas stoves by low and middle income urban families. Almond trees were planted in 1966/67 and approximately 32 hectares each of corn and potatoes were grown both years.

Gross farm returns increased from E^o 339,000 in 1966/67 to E^o 516,000 in 1967/68 (Table 29) due to an increase in total crop hectares and more charcoal production. Production data for both years for corn and potatoes is likely to be underestimated because yields were obtained from asentados' own estimates. Cash farm expenses grow by almost 18 percent and net farm returns rose from E^o 217,000 to E^o 373,000. In this case, labor payments include the usual advances of cash and goods plus the value of corn and potatoes produced and retained by asentados. By having direct access to returns from potato sales in 1967/68, CORA recovered a larger proportion of advances and labor payments declined by 31 percent. When labor payments and fixed costs were deducted from net farm returns in 1967/68, the total debt for the year's operation amounted to E^o 373,000. Net farm returns in 1967/68 covered labor payments but fell E^o 96,000 short of paying fixed costs. Clearly this asentamiento has no debt repayment capacity. The

Table 28.

ASENTAMIENTO VI, ENTERPRISE COMBINATIONS
1966/67 and 1967/68, Alternatives B and C

Enterprise Combinations	Alternative A		Alternative B		Alternative C	
	1966/67	1967/68	Non-use of labor charged E° 0/day E° 14.50/day		Non-use of labor charged E° 0/day E° 14.50/day	
	Number of hectares					
Wheat	52.5	84.0	30.1	30.1	30.1	25.1
Alfalfa	21.0	21.0	90.4	90.4	90.4	75.4
Corn	32.0	32.0	0	0	0	0
Potatoes	32.0	32.0	72.0	72.0	72.0	72.0
Almonds	7.5	7.5	7.5	7.5	7.5	27.5
Barley	0	22.0				
Sheep (head)	950	1,150	1,000	1,000	5,000	5,000
Charcoal (kilos)	107,000	411,000				
Total hectares	145.0	198.5	200	200	200	200

Table 29.

ASENTAMIENTO VI: RETURNS TO CAPITAL
AND MANAGEMENT
CHILE, 1966/67 and 1967/68

Item	Years		Percent Change 1966/67 to 1967/68
	1966/67 ^a	1967/68	
	1968 Escudos		
Gross farm returns	338,951	516,194	+ 52.3
Cash farm expenses	121,525	143,207	+ 17.8
Net farm returns	217,426	372,987	+ 71.5
Labor payments	425,043	291,651	- 31.4
Net farm income	-207,617	81,336	--
Fixed costs	165,390	177,246	+ 7.2
Returns to capital and management	-373,009	- 95,910	--

^a/ The actual values for 1966/67 have been increased by 25.6 percent to account for inflation.

total debt of the asentamiento exceeds 2.2 million escudos (Table 30). Total debt payments of E° 120,000 would be required for the first five years, and E° 68,000 thereafter. Since returns from both 1966/67 and 1967/68 failed to cover annual operating costs, the assessment of these debt installments would simply have increased the total debt incurred during the year (Table 31).

Alternative B

In programming this farm, projected yields had to be kept low because of limited irrigation water. The number of tillable hectares besides garden plots was restricted to 200, the amount for which water is normally available. It was assumed that potatoes would be the principal crop in the rotation since they are most profitable and use the largest amount of labor. It was assumed that they could be grown only two to three years in succession in any one location due to disease problems. Wheat would then follow as a cover crop for alfalfa, which would be retained for three years before returning to another annual crop or potatoes. Therefore, the maximum constraint on potatoes was set at 72 hectares. Almonds were maintained at their present level, and 1,000 head of sheep were included. The charcoal enterprise was eliminated because of the aforementioned lack of market. The labor wage rate was set at E° 14.50 per man-day, equal to average per day labor payments in 1967/68, and total labor use was not constrained.

Column 3, Table 28, gives the results for this program. Potatoes are at the maximum and wheat and alfalfa take up the remaining land. Net farm income from this enterprise mix is E° 225,000 compared to a negative E° 208,000 in 1966/67 and E° 81,000 in 1967/68. Deducting projected fixed costs leaves E° 65,000 as returns to capital and management.

This enterprise combination requires only 19,000 man-days compared to an estimated 26,450 for each of the past two years. A labor constraint of 26,500 man-days was added with all unused labor charged E° 14.50 per man-day. Since the most labor-intensive enterprise (potatoes) was already in the previous solution, this addition constraint did not change the optimum enterprise mix (Column 4, Table 28) but net farm income declines so fixed costs cannot be met (Column 4, Table 32). Thus, this alternative compensates for the income previously derived from charcoal, but does not pay all operating costs. Some form of long-term capital investment is required to create employment and increase income.

Alternative C

An obvious potential investment is that of additional deep wells to augment irrigation water. More water would permit higher levels of fertilization especially for corn, and would bring additional land into cultivation. However, no studies had yet been conducted on the availability and cost of using ground water.

Table 30. ASENTAMIENTO VI: TOTAL DEBT AND ANNUAL INSTALLMENTS CHILE, 1968

Item	Amount in 1968 Escudos	
DEBT:		
Working capital debt		
Tools and machinery	153,132.68	
Livestock	<u>106,623.25</u>	
Total working capital debt	259,755.93	
Less payments	<u>0</u>	
Balance		259,755.93
Land debt:		
Land	1,541,565.00	
Improvements	82,729.39	
CORA's investments	<u>359,124.39</u>	
Total land debt		1,983,418.78
CORA fee (2 percent of working capital and land debt)		<u>44,863.49</u>
Total debt		2,288,038.20

Item	Total Debt	Installments	
		First 5 Years	Last 25 Years
INSTALLMENTS:			
Working capital debt	259,755.93	51,951.18	
Land debt	2,028,282.27	67,609.41	67,609.41
Total	2,288,038.20	119,560.59	67,609.41

Table 31. ASENTAMIENTO VI: RESIDUAL
CHILE, 1966/67 and 1967/68

Item	Years			
	1966/67		1967/68	
	First 5 Years	Last 25 Years	First 5 Years	Last 25 Years
	1968 Escudos			
Returns to capital and management	-373,007	-373,007	- 95,910	- 95,910
Debt installments	119,561	67,609	119,561	67,609
Residual	-492,568	-440,616	-215,471	-163,519

TABLE 32.

ASENTAMIENTO VI: COMPARATIVE RESULTS OF ALTERNATIVES A, B AND C
CHILE, 1968

Item	Alternative A		Alternative B		Alternative C	
	1966/67	1967/68	Non-use of Labor Charged		Non-use of Labor Charged	
			E° 0/day	E° 14.50/day	E° 0/day	E° 14.50/day
	1968 Escudos					
Net farm returns	217,426	372,987	422,334	422,334	449,896	450,231
Labor payments	425,043	291,651	197,109	304,500	248,091	304,500
Net farm income	-207,617	81,336	225,224	117,834	201,805	145,731
Fixed costs	165,390	177,246	159,750 ^a	159,750	159,750	159,750
Returns to capital and management	-373,007	-95,910	65,474	-41,916	42,055	-14,019
Debt installments:						
First 5 years	119,561	119,561	119,561	119,561	119,561	119,561
Last 25 years	67,609	67,609	67,609	67,609	67,609	67,609
Residual:						
First 5 years	-492,568	-215,471	-54,087	-161,477	-77,506	-133,580
Last 25 years	-440,616	-163,519	-2,135	-109,525	-25,554	-81,628
Labor use	26,450 ^b	26,450 ^b	19,094	19,094	26,610	23,180
Operating capital required	487,537	602,260	562,961	670,352	725,529	790,263
Gross value of production	338,961	516,195	624,443	624,443	757,650	766,330

^aE° 80,000 plus 5,500 man-days at E° 14.50 per day.

^bEstimated.

The asentamiento Coordinator had proposed an increase in the sheep flock from 1,000 to 5,000 head. Several thousand meters of fence would be required plus a new sheep dip and corrals. Natural pasture and cropland stubble were to be used as feed. A discounted cash flow budget was prepared under the assumption that the desired flock size would be reached in four years through the purchase of 3,000 ewes. Another possible investment is the expansion of area planted to almond trees as they survive with limited water. The area of possible expansion was limited to 20 hectares which would give a total of 27.5 hectares in almonds.

When these two alternatives are programmed, the results in Columns 5 and 6, Table 33 are obtained. If surplus labor is not penalized, only the sheep flock is expanded. Almonds are not increased because the eight percent discount rate and the long growing period for the trees greatly reduce the present value of future returns. However, it is preferable to substitute 20 hectares of additional almonds for wheat and alfalfa when non-use of labor is charged E° 14.50 per man-day.

Net farm income rises to E° 202,000 with the expanded sheep enterprise, but only 22,610 man-days are required. When almonds are expanded, labor requirements rise to 23,180 man-days but net farm income falls so it is E° 14,000 short of paying fixed costs (Column 6, Table 32).

Comparison of the Three Alternatives

The data in Table 32 permit comparison of the three alternatives. Alternative B is an obvious financial improvement over 1966/67 and 1967/68 but requires 7,400 fewer man-days of labor. When this labor is forced into the solution, net farm income declines and fixed costs cannot be paid. Even expanding both the sheep and almond enterprises in Alternative C does not offer an adequate solution. When all present labor is retained, net farm income fails to pay E° 14,000 of fixed costs and only 23,180 man-days of labor are actually required. Operating capital requirements and gross value of production increase in both Alternatives B and C.

In yet another variation of Alternative C, one broiler unit of the type budgeted for Asentamiento IV was introduced, but the displacement of potatoes to produce the required amount of corn reduced rather than increased net farm income and employment. To increase employment, the corn could be purchased rather than grown, but this alternative exists for any farm and does not account for the specific resources and opportunities of this particular unit.

Therefore considering these alternatives, this asentamiento has no debt repayment capacity if the entire present labor force is retained. In fact, total operating costs cannot be met. Even when labor is reduced to that actually required in Alternatives B and C, returns to capital and management are still insufficient to pay the total land payment and no contribution can be made towards working capital.

TABLE 33. ENTERPRISE COMBINATIONS, SIX ASENTAMIENTOS
CHILE, 1966/67, 1967/68, AND ALTERNATIVES B & C

Item	Alternative			C
	1966/67	A 1967/68	B	
Hectares				
Forages:				
Alfalfa	70.0	62.5	241.3	210.5
Clover and grasses	4.5	113.8	332.7	317.0
Natural pasture	83.2	65.1	0	0
Percent of total	9.4	14.2	34.0	31.2
Cereals:				
Barley	122.2	122.4	0	0
Corn	337.1	206.5	196.3	171.2
Rice	171.7	151.2	108.9	121.8
Wheat	238.5	359.5	265.0	248.2
Percent of total	51.8	49.3	33.8	32.1
Horticultural crops:				
Beans	69.9	54.1	30.0	30.0
Potatoes	67.9	93.2	105.0	96.3
Other	3.0	9.2	0	0
Percent of total	8.4	9.2	8.0	7.5
Industrial crops:				
Broom corn	15.0	10.0	15.0	15.0
Hemp	30.0	14.0	20.0	20.0
Sugar beets	41.1	14.1	35.0	23.0
Sunflower	64.8	33.0	0	0
Tobacco	33.0	22.0	20.9	5.6
Percent of total	10.9	5.5	5.4	3.8
Fruit and nuts:				
Almonds	7.5	7.5	7.5	27.5
Grapes	212.0	215.0	215.0	245.0
Oranges	4.5	4.5	4.5	24.5
Peaches and walnuts	0	37.0	37.0	72.0
Percent of total	13.3	15.5	15.6	21.9
Fallow	103.4	86.7	54.4	60.9
Percent of total	6.2	5.1	3.2	3.6
Asentado personal use	0	23.0	0	0
Percent of total	0	1.3	0	0
Total hectares	1,679.3	1,704.3	1,688.5	1,688.5
Beef cattle (head)	263	219	757	713
Sheep (head)	950	1,150	1,000	5,000
Poultry (no. of broilers)	0	0	0	96,000
Charcoal (kilos)	107,000	411,000	0	0

If CORA chooses to maintain the present farm population, it must plan to subsidize operations and cannot expect debt repayment. Even if part of the excess population is relocated, investments beyond those suggested here will be required to meet the debt repayment criterion. Theoretically, consumption levels could be reduced through some type of forced payment but E^o 14.50 per man-day can hardly be considered extravagant, and it is consistent with the amount paid in other asentamientos.

Aggregate Results for Six Cases

To facilitate aggregation of the results for the six asentamientos, it was necessary to choose one of the B and C Alternatives. Since labor use has been an important concern throughout the study, one was chosen with labor requirements approaching present usage. Those selected are identified as follows:

<u>Asentamiento</u>	<u>Alternative B</u>	<u>Alternative C</u>
I	Non-use of labor charged, without livestock	Non-use of labor charged
II	Non-use of labor charged	Non-use of labor charged
III	Non-use of labor charged	Non-use of labor charged
IV	Non-use of labor charged	Non-use of labor charged, one broiler unit, corn produced
V	Non-use of labor charged	Non-use of labor charged, one broiler unit
VI	Non-use of labor charged	Non-use of labor charged.

Enterprise Combinations

The first obvious effect of programming was to alter enterprise combinations. The distribution of enterprises for 1966/67, 1967/68, and Alternatives B and C is given in Table 33. The key differences between present enterprises and the projected optimum combination are summarized as follows: forages increase from 9 to 14 percent at present to approximately one-third of total cultivated land, and this change is related to an increase from 200 to 700 head of beef cattle; cereals decline from one-half to one-third of total area; horticultural crops remain about 7.5 to 10 percent of total but beans decline by 50 percent; for the industrial crops, sunflowers are eliminated, tobacco is reduced, sugar beets increased, and hemp and broom corn relatively unchanged; fruit and nut crops expand; in the area of livestock, sheep increased and broilers are introduced.

To determine the net effect of these changes on gross output for any commodity, present yields would need to be compared with those estimated for Alternatives B and C. Usually the latter are higher, thereby offsetting part of the effect of decreased area. Another concern is the possible impact on product prices if the conclusions obtained in these six cases were to apply to a substantial number of asentamientos. One questionable product is potatoes. Since domestic demand is satisfied at current prices, increased output would have to be disposed of through export markets. Likewise, exports for nuts, wine and fruit would need to be expanded if present prices are to be maintained. Given the existing magnitude of meat imports and the possibilities for increasing consumption of this income elastic product, additional beef, lamb, and poultry should find ready outlet in the domestic market.

An implicit secondary effect of adopting the programmed alternatives would be increased demand for purchased inputs. To the extent that these are imported, there will be a foreign exchange cost. The nature of supply elasticities for domestic products will determine how increased demand affects prices and industrial employment. Other secondary effects would be felt in transportation and processing sectors.

Gross Value of Production

Gross value of production obviously changes when output changes. Total production on these six asentamientos was valued at E° 3,581,000 in 1966/67 and E° 3,784,000 in 1967/68 (Table 34). Using product prices similar to those in 1967/68, total output for Alternative B almost reaches E° 4,500,000 and exceeds E° 5,000,000 in Alternative C. This result is significant considering that Chile imports large quantities of foodstuffs.

Labor Requirements

Throughout the analysis, programmed alternatives usually required considerably less labor than actually employed in 1966/67 and 1967/68. Only by charging non-use of labor was it possible to obtain enterprise mixes which utilized most of this surplus labor. Labor use in 1966/67 and 1967/68 and the requirements for Alternatives B and C are compared in Table 34. The data for B and C are actual enterprise requirements even though the program charged labor payments according to a fixed labor constraint. Alternative B requires approximately 17,000 fewer man-days than the average used in the two years, and Alternative C some 10,000 man-days less. For reasons explained above, selection of one of the alternatives would probably not result in the discharge of surplus labor nor would surplus workers receive salaries while not effectively working. Rather, the farm work load would be distributed among the total work force and the programmed enterprise labor coefficients would not obtain.

Table 34. GROSS VALUE OF PRODUCTION AND LABOR OPERATING CAPITAL REQUIREMENTS, SIX ASENTAMIENTOS - CHILE, 1966/67; AND ALTERNATIVES B AND C

Item	Alternatives			
	A		B	C
	1966/67	1967/68		
Gross value of production (1968 Escudos)	3,580,523	3,784,201	4,497,409	5,017,004
Labor requirements (man-days per year)	116,380	125,298	103,410	110,829
Operating capital requirements (1968 Escudos)	3,186,004	3,413,787	3,508,582	3,931,642

Operating Capital Requirements

Total operating capital requirements increase from E° 3,186,000 in 1966/67 and E° 3,414,000 in 1967/68 to E° 3,509,000 in Alternative B and E° 3,932,000 in 1967/68. The implication is that if Alternatives B or C are adopted CORA or some other agency must expand its supply of loanable funds. Over time as asentados approach a desired level of consumption, they should begin to save and self-finance part of family subsistence and some farm operating expenses. The rate of inflation and availability of savings institutions will influence their actual propensity to save. Communal or cooperative operations have a disadvantage compared to individual or family farms because profits are generally distributed once or twice a year whereas income may be frequently received. This "lumpiness" in the receipt of family income necessitates a system of advances when recipients cannot or do not save.

Debt Repayment Capacity

Finally, there remains the focal point of analysis, namely debt repayment capacity. A positive residual for any item in Table 35 indicates that all operating costs have been paid, the land debt installment deducted, and a balance or residual is available for application against the working capital debt, i.e., a positive residual implies capacity to pay long-term debts. A star is placed by those residuals that equal or exceed the working capital debt installment. In 1966/67 three out of six asentamientos would have been able to pay both land and working capital debt installments. Five of the six could have paid the land debt in 1967/68 but two of those could not have fully paid for working capital. Under Alternatives B and C, the residuals are higher for all asentamientos (less negative for VI), five out of the six can pay both debt installments, but Asentamiento VI still cannot make any contribution toward debt repayment as all operating costs are not met. It should be recalled that the definition of debt repayment capacity used here does not necessarily imply long-run economic viability.

In summary, compared to 1966/67 and 1967/68, Alternatives B and C have altered cropping patterns, reduced labor requirements, increased gross output and required operating capital, and improved debt repayment capacity. Under existing levels of production and payments to labor, three of the six could pay debt installments with present net farm income. By adopting either Alternative B or C, five of the six could pay debt assessments while retaining the labor presently employed.

Table 35. RESIDUAL, LAST 25 YEARS, SIX ASENTAMIENTOS
CHILE, 1966/67, 1967/68, and ALTERNATIVES B AND C

Asentamiento	Alternatives			
	A		B	C
	1966/67	1967/68		
	1968 Escudos			
I ^{a/}	150,481*	205,414*	418,441*	408,651*
II	93,544*	62,154*	218,519*	258,466*
III	179,417*	33,435	248,380*	304,222*
IV	-27,795	42,364*	135,176*	171,959*
V	-93,467	3,980	34,347*	74,077*
VI	-440,616	-163,519	-109,525	-81,628

* Denotes that the residual is large enough to pay the working capital debt installment.

^{a/} Last 27 years instead of 25 years.

CHAPTER V

Implications of Findings

This chapter includes an extrapolation of the findings for the total population of asentamientos and a description of some policy alternatives which might be considered by CORA and the Chilean government.

Debt Repayment Capacity of the Asentamientos

Since non-probability sampling was used in the purposeful selection of these six asentamientos, it can always be questioned how representative they are of the population of asentamientos operating during the 1966/67 agricultural year or of asentamientos formed after that date. With great variability among asentamientos, it is questionable if a random sample of the size consistent with resources available for this study would have adequately reflected this diversity or if the results would have been that much sounder. It can be said with considerable confidence that these asentamientos represent the bounds of performance. CORA officials unanimously evaluated Asentamientos I and VI as examples of the best and worst in the Central Valley on several criteria including profitability. Even with the bounds established, however, the problem of the frequency distribution within the bounds remains.

One method of evaluating these results is to compare them with similar studies. One study aimed at evaluating debt repayment capacity of randomly selected asentamientos based only on 1966/67 farm returns (9), and the preliminary results indicated similar findings. For 16 asentamientos included in the other study, 9 could have paid assessed debts and 7 could not, a proportion comparable to that derived above for the year 1966/67. The models of analysis and assumptions used were somewhat different, but a comparison of the results for two asentamientos included in both -- II and IV -- yields similar conclusions. The variability among asentamientos is sufficiently large so that approximately 50 percent of those included in both studies could not pay assessed debts from farm income once labor payments are deducted. However, this study implies that most of them could do so by altering the output mix and improving management.

Another method of generalizing about probable asentamiento repayment capacity is to analyze the productive resources available per farm worker. If beneficiaries are to pay debts out of farm income alone, then factors like soil, water, climate, topography, location and markets become extremely important. The first four are undoubtedly most important because they largely determine the range of suitable farm enterprises and the response rate obtained from production inputs. These six asentamientos can provide insights into the amount of resources required per farm worker if debt repayment is to be attained.

The man/land ratio is often used as an index of resource availability. An equivalent measure for asentamientos would be hectares per asentado, but it would fail to include the large number of hired workers also dependent on the land. Moreover, it would not reflect variability in cropping

intensity or efficiency of labor use which may be as important as the land base itself. An index which more closely reflects the desired relationship is the number of man-days actually employed per hectare. It incorporates both the asentados' expectation of the number of people the asentamiento should support, and cropping intensity and labor efficiency. Table 36 lists man-days of labor used per cultivated hectare on the six asentamientos. Cultivated hectares per full-time worker equivalent were obtained by dividing total man-days by 270, the number of days worked by most asentados in a year.

The number of cultivated hectares per worker equivalent varies from less than two hectares to over eight. Asentamiento VI has the smallest resource base because it is over-populated and the sheep and charcoal enterprises do not use cultivated land. The wine-producing Asentamientos II and III have 2.5 to 4.5 hectares per worker equivalent while cereal-producing Asentamientos IV and V have six to eight hectares per worker.

Another method of evaluating the resource base is to consider it in value terms. This approach allows for differences in land quality and fixed investments like orchards and vineyards; working capital can also be added to reflect livestock and machinery availability. The original value of land and farm investments on these asentamientos at the time of expropriation varies from E° 12,000 to E° 31,000 per worker equivalent, as shown in Table 36. Working capital varies from under E° 1,000 to almost E° 4,000, and CORA's infrastructure investments range from under E° 3,000 to over E° 15,000 per worker equivalent. Since CORA's investments tended to be concentrated in housing, investments were higher on Asentamiento I in spite of its good production base while VI received relatively less even though it is poorer.

This wide range in investment per worker and the variety of enterprises found on asentamientos, generate great variability in gross returns and expenditures. Table 37 provides data on gross farm returns and expenditures per man-day for 1966/67 and 1967/68. In both years, gross farm returns per man-day ranged from E° 30.00 to E° 45.00 on all asentamientos except VI. Returns in 1967/68 were higher than 1966/67 except on Asentamientos III and IV. Cash farm expense averaged E° 11.00 per man-day both years but varied from E° 4.50 to almost E° 29.00. Labor payments were slightly less the second year on all asentamientos. Asentamiento I has lowest labor payments and this contributes to its large residual.

Using average values from Tables 36 and 37, an average relationship between labor, land, gross returns and expenditures was calculated. Minimum average gross farm returns of E° 33.50 per man-day or E° 2,350 per hectare are required if operating expenses and debt payments are to be met while retaining the present labor force and current levels of labor payments. Gross returns would be distributed in the following way:

TABLE 36.

LAND AVAILABILITY AND CAPITAL INVESTMENT PER WORKER EQUIVALENT
SIX ASENTAMIENTOS, CHILE, 1966/67 and 1967/68

Asentamiento	Total Man-days Worked	Full-time Worker Equivalents ^a	Cultivated Hectares Per Worker Equivalent ^b	Capital Investment Per Worker Equivalent			
				Land ^c	Working Capital ^d	Infrastructure Investments ^e	Total
1968 Escudos							
1966/67:							
I	18,558	68.7	4.8	20,339	3,873	14,836	39,048
II	28,638	106.1	2.7	12,927	966	3,349	17,242
III	18,896	70.0	4.4	31,056	3,914	3,485	38,456
IV	12,178	45.1	8.4	26,311	3,388	10,032	39,731
V	11,660	43.2	5.8	16,944	2,664	7,964	27,573
VI	26,450	98.0	1.5 ^f	16,574	2,651	3,665	22,890
Total/average	116,380	431.0	3.9	19,688	2,715	6,437	28,840
1967/68:							
I	18,036	66.8	4.3	20,917	3,983	15,258	40,159
II	30,803	114.1	2.4	12,020	898	3,115	16,033
III	24,658	91.3	3.4	23,811	3,001	2,672	29,484
IV	15,546	57.6	6.6	20,601	2,653	7,855	31,109
V	9,805	36.3	7.0 ^f	20,165	3,171	9,478	32,814
VI	26,450	98.0	2.0 ^f	16,574	2,651	3,665	22,890
Total/average	125,298	464.1	3.7	18,284	2,521	5,978	26,783

^aColumn 2 divided by 270, the average number of days worked by asentados in a year.

^bCultivated hectares include tillable irrigated land in all crops, including double cropping, new plantings of fruit and grapes, fallow and natural pasture.

^cIncludes improvements on farm at time of expropriation.

^dTools, livestock and machinery.

^eInvestments made by CORA after expropriation.

^fValues are biased because a significant proportion of labor is used in activities such as sheep and charcoal production which do not depend on cultivated land.

TABLE 37.

GROSS FARM RETURNS AND EXPENDITURES PER MAN-DAY
SIX ASENTAMIENTOS, CHILE, 1966/67 AND 1967/68

Asentamiento	Gross Farm Returns	Expenditures				Total	Residual (+) or Debt Accumulation (-) ^d
		Cash Farm Expenses	Labor Payments ^a	Fixed Costs ^b	Debt Payment ^c		
1968 Escudos Per Man-day							
<u>1966/67:</u>							
I	33.78	11.45	7.69 ^e	2.09	7.47	28.70	+ 5.08
II	29.54	6.42	16.22	1.59	2.77	27.00	+ 2.54
III	43.61	8.71	17.20	3.85	7.26	37.02	+ 6.59
IV	45.39	24.90	14.98	3.20	7.09	50.17	- 4.78
V	44.19	28.61	18.84	1.61	5.12	54.18	- 9.99
VI	12.81	4.59	19.65	2.67	4.52	31.43	-18.62
Weighted average	31.83	11.33	15.93	2.45	5.33	35.04	- 3.21
<u>1967/68:</u>							
I	37.00	7.04	9.73 ^e	4.27	7.69	28.73	+ 8.27
II	38.10	15.71	15.89	2.58	2.57	36.75	+ 1.35
III	30.64	7.55	15.29	3.10	5.56	31.50	- 0.86
IV	35.70	13.77	13.84	1.77	5.56	34.94	+ 0.76
V	45.26	21.45	16.42	3.24	6.09	47.20	- 1.94
VI	19.52	5.41	14.52	3.21	4.52	27.66	- 8.14
Weighted average	32.81	10.89	14.38	3.01	4.95	33.23	- 0.42

^aIncludes labor payments previously assumed part of fixed costs.

^bNon-labor portion only.

^cBoth land and working capital debt.

^dA positive sign indicates that the respective quantities remain after total expenditures are deducted from gross farm returns. A negative sign indicates that gross farm returns fall short of meeting total expenditures by the respective amounts.

^eOther income was earned from the previous owner and work performed for CORA in infrastructure investments.

<u>Item</u>	<u>Per Man-day</u>	<u>Per Hectare</u>
	1968 Escudos	
Gross farm returns	33.50	2,350
Cash farm expenses	11.00	770
Net farm returns	22.50	1,580
Labor payment	14.50	1,020
Fixed costs	3.00	210
Debt payment	5.00	350
Residual	0	0

Using the value calculated previously of four cultivated hectares per worker equivalent, the respective amounts per man-year of four hectares are:

<u>Item</u>	<u>Per Man-year or four hectares</u>
	1968 Escudos
Gross farm returns	9,400
Cash farm expenses	3,080
Net farm returns	6,320
Labor payment	4,080
Fixed costs	840
Debt payment	1,400
Residual	0

Although average relationships must be interpreted with caution, they can help identify possible changes on these asentamientos. For example, to retain the present labor force without making extensive capital investments, workers might be transferred between asentamientos until gross farm returns per man-day approach E° 33.50. Or it might be necessary to invest in the overpopulated units until net farm returns reached E° 22.50 per man-day.

These relationships could also serve as a target for future land distribution. Farms capable of producing E° 2,300 in gross farm returns per cultivated hectare or E° 1,580 in net farm returns under normal management could be settled on the basis of one worker per 4 hectares. Those with less earning capacity could not support as high a population. Of course, additional projections for depreciation, interest on operating capital, and future consumption increases should be made to assure long-run economic viability of the farms.

The present pattern of land distribution can be evaluated using these average relationships. To obtain four cultivated hectares, approximately five hectares are required to allow for roads, canals, and buildings. The average amount of available land per worker on asentamientos as of May 31, 1968, is given in Table 38. These values were derived by assuming the one asentado to 0.9 paid worker relationship found on the six asentamientos applies to the entire population.

Table 38. AVERAGE AMOUNT OF LAND PER WORKER ON ASENTAMIENTOS CHILE, MAY 31, 1968

Zone	Number of Workers ^{a/}	Irrigated Land		Dry Land	
		Total	Per Worker	Total	Per Worker
Hectares					
I	186	816	4.4	40	0.2
II	3,762	15,283	4.1	310,294	82.5
III	2,305	10,023	4.3	122,455	53.1
IV	2,546	13,970	5.5	212,820	84.6
V	2,200	17,470	7.9	29,119	13.2
VI	2,459	17,986	7.3	8,825	3.6
VII	825	9,906	12.0	9,829	11.9
VIII	1,383	981	0.7	50,632	36.6
IX	1,131	968	0.9	38,787	34.3
X	82	--	-	113,197	1,380.5
XI	72	--	-	52,767	732.9
Total/Average	16,951	87,403	5.2	948,766	56.0

^{a/} Number of asentados in that zone as of May 31, 1968, multiplied by 1.9.

The overall average of 5.2 irrigated hectares and 56 dry land hectares is close to the calculated minimum of five hectares per worker. However, locational considerations are important. Zones I and II are located in the arid north of Chile where the adequacy of 4 to 4.5 hectares depends directly on adequacy of irrigation and access to urban markets for labor-intensive high value crops. Much of Zone III is located in the province of Aconcagua, an important fruit and vegetable supplying region for Santiago and Valparaiso where 4.3 hectares can be most adequate. Zone IV encompasses the province of Santiago with several asentamientos having ready access to the Santiago market; therefore 5.5 hectares per worker appears high. Zones V and VI are cereal producing areas with many farms similar to Asentamientos IV and V where seven to eight hectares per worker is almost insufficient. Fruit or grape production completely alters this relationship, however, and units like II and III utilize much more labor. Zones VII through XI are south of any asentamientos included in this study so generalization is difficult.

Policy Alternatives

It seems that unless changes are made in the operation and organization of asentamientos prior to land assignment, beneficiaries on perhaps as many as 50 percent of them will not be able to pay all debts established by present assessment policy. Some will be able to pay part or all of the annual installments in normal years. Others will not even be able to do so in good years. Faced with this situation, there are a number of policy alternatives that CORA or the government could consider.

Transferring Workers

An obvious alternative would be to transfer families among asentamientos so productive resources, gross returns, and expenditures per man-day of labor input would be more nearly equal. As shown in Table 38, the weighted averages of returns for all six asentamientos in both years almost permit payment of operating costs and debt payments. If total output and cash expenditures remained unchanged, moving workers from overpopulated to underpopulated farms would increase the residual after debt payment for the former and lower it for the latter.

Actually effecting such transfers is difficult because people resist moving from a familiar environment even if promised higher income. The present asentados on an asentamiento are reluctant to accept more families knowing that farm profits would have to be divided among more workers. A practical problem is that of identifying those people who should move since the present families usually do not want to make the selection.

One point is clear from experience gained to date. Altering farm population must be accomplished before or shortly after formation of an asentamiento. Once it has begun operations, solidarity develops, and through joint action the asentados can frustrate CORA's attempts to move anyone.

When an asentamiento is now formed, agreement on preferred number of families may be obtained but by the time they are selected and housing built, the first asentados may refuse to accept them. To prevent delays in forming asentamientos, CORA must devise a method to immediately bring in new families, lodging them in make-shift fashion until permanent housing is available. An alternative would be to divide the property, form one asentamiento immediately and another later when new families arrive. This would intensify bookkeeping problems but would eliminate the difficulty of outsiders gaining acceptance from a cohesive and, perhaps, hostile group of existing families.

This policy obviously implies that CORA can exercise great authority in mandating where farm families live and work. In some cases, coercion would be required to make it work. But if there ever is a time when CORA can influence behavior, it should be prior to formation of an asentamiento.

Expanding Output

A second alternative is to increase output through improved management and selective capital investments as demonstrated in Chapter IV. If successful, it would not only reduce the number of workers to be transferred, but also increase total farm production and perhaps even farm employment.

Several factors must be considered. First is the matter of demand for agricultural products. Output expansion in Chapter IV was limited to products for which future demand prospects are good. However some labor-intensive high value products like fruit and vegetables may have quite inelastic demand so a better understanding of basic price and supply conditions is required before promoting individual enterprises. This is especially true for long-term investments that commit farms to specialization in certain commodities.

Although effective demand places an upper constraint on total agricultural production, CORA must assist the marketing of asentamiento products if they are to compete with the non-reformed sector. Most CORA agronomists are preoccupied with the immediate problem of maintaining production with little attention to its disposal. A prime example of this problem was discovered on an asentamiento ideally suited for horticultural crops located just 20 kilometers from downtown Santiago. The first two years, CORA assisted the asentados to acquire potato production contracts for part of the land with the balance planted to vegetables. When the contracts ended and low net returns from other products were attributed to Santiago's monopolistic wholesale market, the asentados shifted to wheat with its more reliable price.

Any broad attack on marketing problems would certainly have to be made within the framework on national policy. It would be difficult, for example, for CORA to establish a horticultural market to circumvent the present wholesale market without it being an expressed policy of the government. Nevertheless, marketing of asentamiento products could be

organized to exercise the market power inherent in their volume of production. Marketing contracts could be negotiated with major wholesalers and retailers for specific quantities and qualities of product. High-grade asentamiento-produced fruits and vegetables marked with the CORA label could be sold in supermarkets and open-air markets. This would serve the dual objectives of providing quality consumer products while winning support for reform. Efforts should be directed toward developing export markets in the same way.

The supply of operating capital is another factor which affects farm level decisions to increase output. The comparison of Alternatives A, B, and C in Chapter IV revealed a substantial increase in operating capital required for the latter two. There did not appear to be any significant limitation of CORA funds for purchasing production inputs, the cost of which is recovered in the year of expenditure. Presumably CORA or some other government credit agency could provide this type of financing in the future. However, credit for long-term investments such as livestock and poultry operations, or new vineyard and fruit orchards may be more restricted. CORA agronomists claimed that such projects have been rejected because of budgetary limitations, but other considerations may have been the real reason. It is hard to imagine insufficient funds for well-conceived projects which would at once expand agricultural output and increase farm income.

The adoption of recommended production practices deserves attention. Chilean agriculturalists will probably continue to exhibit the same wide variability in utilization of production techniques found almost everywhere in the world, but there is no reason to anticipate that reform beneficiaries, as a group, will be more reluctant to accept changes when benefits are assured. One of the chief hindrances now is the dearth of quantitative analysis regarding expected returns for such changes. Asentados and CORA agronomists have general notions about returns, expenses, and labor requirements for various enterprises, but few studies of net returns per hectare or per man-day. There was no evidence that asentamiento records covering labor use by enterprise were ever summarized or that net returns were calculated from operating statements. Farm planning is now primarily based on traditional farm activities and the agronomists' notion of production and marketing possibilities.

One disquieting observation which requires further study is the widespread use of fertilizer and other techniques in communal operations but not on private plots. There are at least two possible explanations. One is that these plots are often the wives' responsibility, and purchased inputs are traditionally not employed. Or perhaps the collective decision to use such items on communal land is obtained because a few leaders strongly advocate it or the cost and risk are spread among several persons. If the latter is true, it implies that communal rather than individual assignment and operation of land would be preferred.

Another type of information crucial in influencing asentado behavior is the debt assessment. Nowhere were asentados informed of the farm's value or the cost of CORA's investments so it is impossible for them to anticipate annual debt installments. Thus, when profit is realized for the year, there is no way to judge its adequacy in paying debts. Determining precise debt estimates before land distribution would be impractical; however, rough estimates would help educate asentados about future obligations.

Reducing Labor Payments

Expanding output is one method of increasing net farm income, reducing operating costs is another. Since labor payment constitutes the largest single item of asentamiento cash expenditures, it is logical to look for possible economies here. As was demonstrated in Chapter IV, labor use could be reduced while expanding output. Also the daily rate paid to labor could probably be lowered. Given the difficulty of stimulating output, a reduction in employment or wages may be an easier adjustment to make.

The current system may actually be encouraging such an adjustment. Assigning asentado status to only some of the workers actually employed on asentamientos has the obvious effect of creating a two class social structure. If asentados are forced to economize to make debt payments, one response will be a reduction in the use of labor and wages. Only when hired workers are relatives of asentados is there likely to be a reduction in asentado income in order to maintain the largest possible work force. This alternative, of course, is a typical response for a capitalistic system. It places the objective of debt repayment higher than the reform's goals of increasing employment and farm worker income. Choosing it would imply that the reform is not really reversing or even slowing past agricultural employment trends. If the rapid increase in asentado real income arising from formation of asentamientos is not accompanied by increases in output, reform may actually accelerate the trend. The basic difficulty stems from pricing farm labor at prevailing market rates rather than at its social opportunity cost. Employment must decline if the Chilean society wishes to pay both reform costs and increased worker income out of farm earnings, without either raising product prices or creating conditions for increasing output.

Scaling Down or Foregoing Debt Payment

The discussion up to this point has assumed that payments are fixed by legislation and assessment policy. In fact, debts could always be scaled down, stretched out, or entirely eliminated for beneficiaries with limited payment capacity. This would eliminate a source of frustration and perhaps prevent attacks on the system by persons who were pressured to pay. Selection of this alternative and its possible effects on financing reform would depend upon the attitude of the Chilean public. If other financial resources were provided to offset those not recovered by debt payments, the reform program could continue with no more than its present financial limitations. However, if the society refused to tax itself sufficiently, then either debts must be collected or the reform budget reduced with concomitant restrictions on activities.

A serious problem with this alternative is selective application. If as many as 50 percent of the beneficiaries have payment problems, it is questionable if the entire system can be kept intact with an aggressive collection policy. If it became known that there was an explicit or even tacit acceptance of non-payment for certain persons, any group of beneficiaries could argue for exemption as well. The government always has the opportunity to withhold future operating credit to those who refuse to pay, but this would reduce income earning capacity even more, thus making it more rather than less difficult for them to pay.

Alternative Institutional Arrangements

Given the practical limitations of the policy alternatives listed above, a more fundamental change in institutional arrangements may be required if reform goals are to be achieved. Every agrarian reform must evaluate the best form or forms of farm organization and land ownership to substitute for the present structure. To meet the goals of the Chilean reform, a system is required which employs the maximum amount of labor, stimulates output-increasing investments, gives security to beneficiaries, permits future adjustments in farm size and operation, and generally creates an agricultural structure conducive to modernizing agriculture. The Chileans appear to assume that ultimately some form of private ownership rights will be granted. Cooperative, individual, and mixed systems have all been proposed; it is only recently that CORA clearly stated a preference for the cooperative form.

Several current asentamiento problems must be corrected if a cooperative system is to improve on present performance. First, the present two class social system must be abolished. Either the present number of asentados is adequate and hired workers eliminated for the sake of economic efficiency, or all should be incorporated as asentados and share in land redistribution. Secondly, a standard daily wage paid to all persons irrespective of abilities or productivity is a simple but unrealistic method of income distribution. An alternative must be developed which will motivate members to energetically employ their time and talents. Thirdly, an accounting system must be instituted which will identify, and thereby permit the liquidation of each individual's contribution to capital growth. In the asentamiento, the only way to participate in the growth of farm assets is through increased income that such capital generates. The value of capital accumulated during a worker's employment is retained rather than distributed to him when he terminates membership. Asentados logically wonder what equity or security their heirs will inherit and this uncertainty surely contributes to the resistance towards accepting more asentamiento members and the desire for individual ownership.

Family farms offer advantages that are difficult to simulate in producer cooperatives. Investment is stimulated because earnings from current operations or capital growth are received by the person contributing the labor and/or management. Moreover, family labor is not valued at market wage rates and this often leads to greater employment. Small holdings have been criticized because of the primitive technology often used, but it must be remembered that they have operated in a discriminatory environment. With adequate access to capital and reliable product markets, their performance should be much better. Moreover, much of the technology used on larger farms is primarily labor-saving and is not crucial to this stage of Chile's agriculture. There are certain economies in providing services to cooperatives rather than individual farms for a highly-structured program such as CORA's, but the major limitation hindering objective consideration of non-cooperative landholding systems seems to be ideologic, not economic.

Chilean public sentiment is probably to grant ownership rights to beneficiaries. However, perhaps long-term societal needs are best achieved through restricted usufruct rights while the state retains ownership. Having been exposed only to private ownership, most beneficiaries would hardly prefer this alternative, unless reform is extensive enough and so well institutionalized to alleviate fears that these rights might be later withdrawn. But when society intervenes to create a more suitable agricultural structure, it certainly has the right and responsibility to evaluate all possible improvements. If land use by one group is judged socially inadequate, surely assigning it unrestricted to another could only be interpreted as blind faith or political expediency. Indeed, one reason given for establishing cooperative units is that of preventing the formation of another anti-social system.

Capital leasing which separates capital ownership from firm management is a central feature of labor-managed economies like Yugoslavia and could offer an alternative for Chilean agriculture. Firms compete for the use of borrowed funds which have a fixed rate of return. Management then rests with the workers who share earnings after deducting operating and capital costs. For Chile's agrarian reform, cash rental could be set equal to present debt installments in order to finance the program. By carefully setting rental rates, it should be possible to encourage capital-saving labor-intensive activities. The social function of land would be emphasized by perpetual rental payment whereas it may be neglected by owners once a debt is paid. Long-term leases of, say, 40 to 50 years would give as much financial security and investment incentive as actual ownership. Just as beneficiaries may refuse to pay debts, renters could refuse to pay rents. Any group capable of organized collective action can thwart policy. But the government should have more flexibility in expeditiously dealing with non-payment of rents than is possible when the highly-charged issue of ownership is involved.

These alternatives certainly do not exhaust the possibilities which might be considered. The goals of reform are often conflicting so there may be no single ideal solution. As has been demonstrated here, debt repayment, increased worker income and maximum farm employment are not all easily obtained simultaneously. A policy designed to achieve one goal may reduce possibilities for meeting others. Some type of balance must be struck which probably will not maximize effects on one but improves all.

The overriding problem for the entire reform program is the political and ideological uncertainty inhibiting the development of clear policies. The asentamiento stage will never be used effectively until the post-asentamiento landholding and operating system is specified. If the creation of asentamientos as an experiment in communal farming is to be used to its fullest advantage, it should be contingent upon the probable continuation of such a system. If an individualistic form ultimately prevails, this highly-complicated communal arrangement may simply be an expensive temporary method for maintaining farm production.

This conclusion accentuates once again the basic political nature of reform. If the Christian Democrats had sufficient political power, they would probably follow their technical and ideological inclinations and pursue some type of communal or collective farming system. However, it is difficult enough to obtain a consensus for such a policy within the party, much less within the country as a whole. In light of this reality, the most they can hope for is that asentamientos will provide a satisfactory experience in communal farming so that at least some of the beneficiaries will choose it as a means to operate, if not own land. But before the majority are likely to voluntarily adopt it, a great number of actual and potential problems must be resolved.

CHAPTER VII

Summary

The Frei government was elected to power in 1964 with a pledge to benefit 100,000 families through agrarian reform during his six-year presidential term of office. Asentamientos formed on expropriated farms play a central role in the program. They are organized to farm the expropriated land, train asentados to assume responsibility as future operators, stimulate community development, promote capital accumulation by asentados, and create necessary farm infrastructure. As of September 30, 1968, over 10,000 families resided on asentamientos with an average of 10 irrigated hectares per family. Fifty-five percent of these asentamientos with 56 percent of the families were located in the Central Valley, the best agricultural region. At the present rate of expropriation, approximately 20,000 families would be affected by 1970, an amount equal to 20 percent of the 100,000 family goal.

Beneficiaries are to pay assessed debts within a 30-year period after land assignment to receive final land titles. The debt is based on tax assessed value of land and improvements plus CORA's infrastructure investments. Debt installments are adjusted in such a way that the deflated value of total installments may be less than the original assigned debt. Working capital debt consisting of tools, livestock and machinery is to be paid five to seven years after assignment.

Six asentamientos were selected for a study of debt repayment capacity. Each had been operating for two years, and was paired with a well-managed private farm. Financial returns for the asentamientos were obtained from official sources for the agricultural years 1966/67 and 1967/68. Owners of the private farms authorized the Catholic University to grant access to their respective 1966/67 farm accounts included in a farm accounting service.

Using these data, debt repayment capacity was projected with present and potential farm income. Present debt repayment capacity was defined as that attained from present income, while potential repayment capacity was determined through a linear programming model estimating maximum net farm income. Technical coefficients for programming were obtained from the private farms and other sources of data. The value of existing farm capital was converted to annual installments using the longest permitted repayment period. These installments were compared with the financial returns from present and potential farm income. Due to the particular definitions used in the analysis, capacity to pay debt installments does not necessarily assure long-run economic viability of the farms.

Of the six asentamientos studied, net farm returns (gross farm returns minus cash operating expenses) increased from 1966/67 to 1967/68 on all except one. Returns to capital and management (net farm returns minus labor payments and fixed costs) declined on one of the six. If debt installments would have been charged in 1966/67, three asentamientos

could have paid both land and working capital installments. A fourth could have paid 50 percent of the land installment. The two others could have paid neither land nor working capital installments. In 1967/68, five of the six could have paid the land debt installment, but two of those five could not have completely paid the working capital assessment.

Comparisons with the private farms showed that improvements could be made in output and efficiency. Asentamientos use less fertilizer but have higher machinery costs and use more labor relative to output. Yields could be increased through recommended usage of fertilizers and other approved practices.

Improved management and an optimum output mix were projected for each asentamiento. With these improvements, net farm income (net farm returns minus labor payments) increases on all six asentamientos. The poorest farm can almost pay the land installment. Under this assumption, required farm labor declines to 70 or 80 percent of current use. When this surplus labor is retained and paid the same wage earned by required labor, labor-intensive enterprises are forced into the solution, net farm income declines but five of six asentamientos could still pay debt installments.

Capital investment in profitable labor-intensive enterprises was programmed for each asentamiento. Even by adopting such investments, one asentamiento still cannot retain the present labor force and pay debt installments. Three others could increase farm employment while two earn sufficient income to maintain surplus labor and pay debts.

Adoption of the programmed alternatives would increase production of forages, beef cattle, poultry, sheep, fruit and nuts. Area devoted to cereals, fallow, and natural pasture would decline. Gross value of production would increase by more than 25 percent over present levels, and operating capital requirements would rise by 13 to 25 percent.

Average relationships between land, labor, gross returns and expenditures were calculated for 1966/67 and 1967/68. With present levels of labor efficiency, an average of four cultivated hectares provides full-time employment for one worker. An additional hectare is required for roads, canals, and buildings. These five hectares must generate on the average E^o 9,400 in 1968 escudos if operating costs, debt payments, and current labor payments are to be met. As of May, 1968, the total reform program was estimated to average slightly more than five irrigated hectares per farm worker. The three northern administrative zones of CORA average between 4 and 4.5 hectares per worker while southern zones exceed seven hectares, a man/land relationship similar to that found in the six asentamientos. Although these average values suggest that debt repayment is possible, the actual performance on any one farm depends on the size of its population and the enterprises suited for it.

To achieve debt repayment capacity, workers could be transferred among asentamientos, output could be expanded, payments to labor could be reduced, or debt payments scaled down, stretched out, or entirely eliminated for selected beneficiaries. Other alternatives would be to create family rather

than cooperative farms or cash rent land to beneficiaries with the state retaining ownership. Some of the reform's goals conflict so any policy alternative must be evaluated for its effects on each. It is clear that achieving debt repayment, expanding output and employment, and maintaining operating capital requirements at modest levels may not be simultaneously compatible. The most serious problem which inhibits the development of clear policies and reduces the effectiveness of asentamientos is political and ideological uncertainty.

EPILOGUE

In the end of 1970, Socialist Salvador Allende succeeded Frei as Chile's president. He was supported by a coalition of small leftist parties including the Communists and the radical Leftist Revolutionary Movement. For his agricultural minister, he selected Jacques Chonchol, a former Christian Democrat that for a time during the Frei government headed INDAP, the organization responsible for working with small farmers, cooperatives and farm unions. Chonchol, who had experience as an FAO advisor in Cuba, has consistently argued for a massive, drastic, and rapid agrarian reform. This attitude put him at odds with the gradualistic approach adopted by Frei, and contributed to his ultimate resignation.

Allende's main campaign theme called for elimination of domestic and foreign impediments to national development, and his proposed programs included a rapid acceleration of agrarian reform, Chileanization of foreign interests, and nationalization of certain production processes and public services. Such proposals won him sufficient support to be elected, but thoroughly frightened people in higher socio-economic classes and contributed to the subsequent flight of people and capital soon after the election. Limitations were increased on the amount of hard currency travellers could take out of the country in order to stem some of the capital outflow.

Within a few months after the election, the government began implementing the takeover of selected industries and banks. In both cases, these transactions required indemnification of present owners through deferred payments. Overtures were made to Cuba, China, and other socialist countries to open or reopen talks leading to diplomatic relations. The public debate accompanying these measures created uncertainty among national and international investors, and investment fell off. It was reported that hard currency reserves accumulated because high copper prices were being rapidly drawn down. Prices began to rise and governmental attempts to control inflation ran head on into workers demanding higher salaries.

At the same time, trouble developed in the rural areas. Peasants who had been promised land by both Allende and Frei began to lose patience and started taking over farms in southern Chile. Warnings and appeals for public order were made by the government but little direct action was taken. When these takeovers reached a few hundred, and rumors began circulating about armed peasants and landowners roaming the countryside, Chonchol was dispatched to deal with the problem. In a sense he was asked to perform a function similar to his former role, because it was the INDAP program that provided an escape valve for peasants who could not be rapidly incorporated into CORA's agrarian reform program.

Allende is faced with a serious dilemma. First, his supporters - the workers, peasants, and intellectuals - are pushing for more and faster reforms. Secondly, given his objective of helping lower socio-economic classes, he would probably prefer to not charge beneficiaries for land distributed in the agrarian reform. Yet even though he won strength in

local elections in early 1971, he is still faced with strong opposition from the Christian Democrats, who are still the strongest single party, and the rightist parties. The legislative changes required to expedite and implement these reforms can not be readily obtained, so he is forced to adhere to present provisions. However, he still has a good deal of room for maneuver. Unconfirmed press accounts report that within five months of taking office, his regime had expropriated 812 farms totaling nearly two million acres compared to the total of 4.5 million acres expropriated by the Frei government in six years.

But unless he succeeds in altering the constitution and agrarian reform legislation, he will have to make expensive expropriation payments to landowners, and beneficiaries will be assessed a portion of total reform debt. Of course, CORA can always choose to ignore cases of unpaid debt installments, and indeed it will probably be difficult for Allende to take a strong hand against delinquent beneficiaries when they undoubtedly comprise an important element of his support. It would be hard to visualize, for example, his government expelling beneficiaries for non-payment when his entire orientation is to help the lower classes.

His political orientation notwithstanding, Allende must face the financial reality of simultaneously undertaking reforms in agriculture and industry at a time when the economy is sluggish and the balance of payments situation is deteriorating. Unless a politically acceptable method can be found for confiscating foreign and national interests without compensation, he must obtain domestic financial resources to finance these takeovers. Moreover, the agricultural sector may require even higher levels of investment in order to generate growth and get the temporarily stagnating production process moving again. These real financial constraints may encourage continuation of some level of beneficiary payments as a way of making the agricultural sector contribute its fair share. In that case, debt repayment capacity will continue to be an important consideration in the agrarian reform.

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