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Agricultural development through agrarian reform in Costa Rica

Luis Villani Zamora
Iowa State University

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AGRICULTURAL DEVELOPMENT THROUGH
AGRIARIAH REFORM IN COSTA RICA

by

Luis Villanti Zamora

A Thesis Submitted to the
Graduate Faculty in Partial Fulfillment of
The Requirements for the Degree of
MASTER OF SCIENCE

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Approved:

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Ames, Iowa
1968

Signatures have been redacted for privacy
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I. INTRODUCTION

Costa Rica, like any other of today's developing countries of the world, is in search of economic development. Development implies movement toward specific objectives. One of these objectives is the achievement of a sustained increase in real income per capita. The Costa Rican gross national product (hereafter called GNP) showed an annual rate of growth of 6.5 during 1950-1962, while the annual rate of population growth was 3.6. This means that the per capita real income increase was 2.7 per year. Since 1900 the nation's economy has been closely dependent upon international trade. Coffee exports to Europe in the last one-half of the nineteen century and of coffee, bananas and cocoa in the present century have been almost the only source of foreign exchange. These exports amounted to 92 per cent of all exports in 1962 which represented about 20 per cent of the nation's GNP. Manufactured goods, including capital goods, are imported with earnings from these exports. Price fluctuations of these agricultural products in the world market have determined to a great extent the pattern of growth of the economy.

The contribution of the manufacturing industry to the GNP has been small in the past. However, it has showed a sustained growth in the last fifteen years and it is one of the most dynamic sectors of the Costa Rican economy. Its contribution reached around 14 per cent in the early 1960's while it was 12.7 in 1950. Furthermore, the participation of Costa Rica in the Central American Common Market offers

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1In this study these objectives are stated in Chapter II.
possibilities of an even more accelerated development of the manufac-
turing industry.

Most of the less developed countries—Costa Rica not being an
exception—devote a large proportion of the total labor force and other
resources for agricultural purposes yielding a relatively low contri-
bution to the country's GNP. Thus in Costa Rica nearly 50 per cent of
the total labor force found its modus vivendi in agriculture and shared
about 30 per cent of the GNP, in 1962 (43, p. 1). Under these circum-
cstances it is not surprising that the per capita productivity level in
agriculture ranks the lowest of any sector in the Costa Rican economy
and also its annual rate of growth is likewise one of the lowest in the
nation (42, p. 136).

For several reasons, agriculture in less developed countries could
be the leading sector in their quest for economic development. These
reasons include (1) the possibility of achieving a higher level of
production with the same amount of resources provided that the input
mix is changed, i.e., by using a different production function (2) agri-
culture produces "one of the most important material inputs associated
with the process of capital accumulation, namely, the foods and fibers
necessary to sustain any labor which are diverted to any form of
economic activity" (47, pp. 43-44) (3) in many underdeveloped countries
agriculture represents "the prime immediate source of foreign exchange
earnings" (47, pp. 43-44) which can be used for the purchase of capital
goods or supplementary food supplies.
A. The Problem and Area Delimited for This Study

The central objective of this work is to study the contribution agrarian reform may perform in achieving agricultural development and hence overall economic development in Costa Rica. Agricultural development, by and of itself, is not going to bring about economic development. This complex process requires much more than that. Nevertheless, agricultural contribution to economic development is an essential element of this process.

In explaining the backwardness of Costa Rican agriculture are defects in land tenure structures which, supposedly, are impeding agricultural development and hence impede national economic development in terms of per capita productivity.

In October, 1961, the Costa Rican government enacted the Land and Land Settlement Law¹ (hereafter called the Law) designed to correct experienced problems or defects in the land tenure arrangements of the nation. Since the Law constitutes a substantial change in the structural setting within which agriculture will be carried on in the years to come, much of the success or failure for the attainment of the targets assigned to the Law by the Economic and Social National Development Plan (hereafter called the Plan) can be attributed to the ability of the Law to fulfill the gap between the developmental goals of the country and the agrarian situation in the pre-Law days.

The main endeavor of this work will be to study the Law as a means

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¹It is necessary to clarify that before the promulgation of the Law, several institutions were pursuing to subdue some of the structural defects to be analyzed in this study. Henceforth, when we refer to the Law we will be considering it alone and/or these other institutions.
to achieve the developmental goals. In this process attention will be focused upon structural variables, particularly land tenure structures, as means facilitating or hindering the achievement of agricultural development as an inherent part of the economic development of the nation.

B. Objectives of This Study

This study will be carried out by analyzing the contribution of land tenure structures to the agricultural development of Costa Rica through incentives, knowledge and capital criteria.

The specific objectives of this work can be synthesized as follow:

1. To develop conceptually a model of economic development with particular emphasis placed on land tenure structures as means of providing the essential elements for a movement toward achieving the objectives of agricultural development which, in turn, becomes a necessary ingredient of overall economic development.

2. To provide hypotheses in order to test conceptually the degree of consistency of the main provisions of the Law in terms of their ability to satisfy the essential elements of agrarian development.

3. To suggest modifications in the Law on the basis of the conceptual analysis.

4. To suggest further research needed to analyze more adequately the provisions of the Law.

C. Hypotheses for Achieving Objectives

On the basis provided by the means-end-continuum framework illustrated in Chapter III, a set of hypotheses (definiting problem hypotheses, diagnostic hypotheses and remedial hypotheses) are formulated
as directors of inquiry for this study. These categories of hypotheses are derived each to analyze the extent particular land tenure structures can obstruct or facilitate the achievement of the development goals through incentives, knowledge and capital.

For the purpose of evaluating the extent to which the land tenure structures considered by the Law satisfy the necessary conditions of efficiency as means toward the achievement of the development goals, three criteria are used as guide in resource allocation. In this study these criteria are viewed like essential elements of agrarian reform which, in turn, becomes a necessary condition for agricultural development. These criteria can be summarized as follows:

1. Incentives for the farmer to improve his productivity.
2. Adoption of technological and managerial innovations.
3. Capital formation and access to capital.

D. Procedures and Methods

Considering the objectives of both the Law (Chapter V) and the Agricultural Plan\(^1\) of the nation are non-contradictory with those proposed in this work for achieving agricultural development (Chapter III), the application of these hypotheses to the particular situation of Costa Rica will reveal, it is hoped, the ability of the Law to satisfy the essential elements for the agricultural development of the country. Failure and success elements in the structural arrangement of the nation

\(^1\)The main objectives of the Agricultural Plan are (1) to increase production and productivity, (2) to proportionate farmers a greater share of the agricultural product, and (3) a greater regional development (43, p. 25). The objectives of the Law are given in Chapter IV.
can be identified on the basis of this analysis. These two elements will make possible the suggestion of modifications in land tenure structures. Even though hypotheses are derived in Chapter III, their application to the agrarian situation of Costa Rica is carried out in further chapters. In this study, testing of these hypotheses will be carried on at a conceptual level since data for this purpose is unavailable. However, some methods suitable for the test of the hypotheses formulated in this study and the required data for this purpose are suggested. At any rate, acceptance or rejection of the proposed hypotheses can be pursued through conceptual or statistical procedures.

III. Plan of This Study

First, the interrelationship between economic development, agrarian reform and agricultural sector are treated. The relevance of land tenure institutions in the search of agricultural development and hence of economic development is stressed (Chapter II).

In Chapter III the conceptual approach to the analytical framework is illustrated. On the basis provided for it, three different categories of hypothesis are developed (problematic hypotheses, diagnosis hypotheses and remedial hypotheses).

Then, the previous situation to the promulgation of the Land and Land Settlement Law is analyzed. It includes a brief description of the country, the land tenure situation, the population problem and the major objectives and provisions of the Law (Chapter IV).

In Chapter V an attempt is made to identify how the Law satisfies the necessary elements for agricultural development in Costa Rica.
Finally, the summary of this study and the recommendations are presented in Chapter VI.
II. INTERRELATIONS BETWEEN THE AGRICULTURAL SECTOR AND THE NATIONAL ECONOMY AS AFFECTED BY DEFECTS WITHIN THE AGRICULTURAL SECTOR

Since agrarian reform in this study is evaluated in terms of its contribution to economic development, the relationships between economic development, the agricultural sector, agrarian reform and the effect of land tenure institutions on agricultural development are briefly reviewed in this chapter.

A. Economic Development

Up to the present, in spite of all economists' efforts, economics has not been able to produce a unified and comprehensive theory of development.

Economists have not been able to construct, much less agree on, a single and unbroken chain of causes and effects that neatly explain the transition from 'underdevelopment' to development... and in fact it cannot be denied that in comparison with the elaborate construct of static partial and general equilibrium theory, our dynamics, particularly those dealing with underdeveloped countries, have themselves an 'underdeveloped' look (29, p. 50).

In absence of such a theory economists have devised different approaches with respect to the analysis of development. Some economists, recognizing limitations of theory seem to suggest that "it would be prudent to leave well enough alone" if after all "existing knowledge does not provide a satisfactory basis for improving" the process of economic development (51, p. 269). However, as this same author recognises, this point of view cannot be accepted simply because of the urgent need for economic development. Others, as Cittinger says, have sought to point out particular indexes of economic progress, to discuss turning points
of economic development, and to re-assess the applicability of existing economic theory and the assumptions on which it is based, although, no economist pretends to have anything more than some interesting guideposts (20, p. 47). Though recognizing the role and importance of the theoretical approach, Long warns economists that for the sake of "simplicity, precision or nicety of argument" they should not draw analysis out of theories leading to policies either erroneous or irrelevant to total policy judgments, and, he concludes by emphasizing that "To the extent that such an extension of economics would cause it to lose precision, I should answer, better to lose precision than to lose relevance" (34, p. 730).

Since no general theory is available to study rigorously the transition from underdevelopment to development, an alternative procedure is to analyze the course economic progress has followed in today's developed countries in order to identify the basic transformations these countries have experienced in their process of development. This analysis may provide clues about the nature of changes leading to development. Of course, "looking at symptoms does not provide an explanation of the physiology of growth. But to the extent that the same set of symptoms appears in all countries which have undergone economic growth, this approach gives some confidence that the generating mechanisms may be unique (35, p. 271)." Gittinger proposes the following necessary conditions for economic development: (1) the subsistence norm, (2) factor rewards in accordance to productivity, and (3) increased efficiency of labor which contributes increased efficiency of capital, increased efficiency through adjustments in
economic institutions, increased efficiency through adjustments in
social institutions, and increased efficiency through dissemination of
information (20, p. 126). These essential elements or necessary con-
ditions for economic development as Gittinger stresses must be regarded
as necessary guideposts and not necessarily as causes of economic
development. They provide rather 'ends-in-view' with which to focus
analysis of economic development" (20, p. 127).

Specification of goals is, however, basic in the analysis for at
least two reasons.

"First, they set the norm from which may be determined the
problematic situation as the gap between the norm and the
present situation. Second, ends serve as criteria for
evaluating particular means (practices, policies or other
courses of action) in terms of the degree to which the yield
consequences in line with the ends" (81, p. 13).

If goals (norm) are not clearly specified we will invite policy deter-
mination at the risk of unexpected consequences for implicit objectives
or insufficient pursuit of that which we pursue.

In this work the goal or end-in-view is economic development.
This concept, regardless of the literature that has been written on
this subject in recent years "is extraordinarily lacking in explicit
definitions of the basic terms it employs" (83, p. 9). However, it is
widely accepted by economists that the process of development is

1Schumpeter considers that economic growth is not an autonomous
phenomenon; that is to say, "It is not a phenomenon that can be satis-
factorily analyzed in purely economic terms alone. This conclusion...
can be avoided only if we adopt the Marxist hypothesis," namely, an
economic interpretation of history. Schumpeter proceeds to point out
that, "Since economic development is not autonomous, being dependent
upon factors outside of itself, and since these factors are many" he
concludes, "No one factor (cause) theory can be ever satisfactorily"
(54, pp. 3-4).
closely associated with a continuous increase in per capita income. A concept on which there is not complete agreement refers to the question of whether economic development implies income redistribution. Perhaps the present stage of economic knowledge on what can be called "optimum income distribution" explains in part this lack of agreement. However, as Galbraith asserts, "...Economic liberation is the first step to economic advance. Until people have a part in economic progress, there will be no economic progress..." (19, p. 22). The same author continues stressing that "people, especially poor people, are not especially influenced by economic gains in the abstract. It is what they can use and enjoy that counts" (19, pp. 6-7). A similar point of view is substantiated by many other students of economic development and agrarian reform (20; 59; 49; 55; 4; 6). In this work by economic development is meant:

"A process whereby the people of an area come to utilize their human and physical resources to bring about a sustained per capita increase in the output of scarce goods and services, provided there is at the same time a movement in the direction of more widespread distribution of these goods and services" (20, p. 116).

This definition, among other things, implies change in structures. Since it is possible to obtain, at least temporarily, increase or growth of a magnitude—for instance, income per capita—without any significant change in structures, economic growth in this work is

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1 In this context "structure" bears a double meaning. First, it means a set of proportions capable of being represented, at least in part, by input-output tables (8, p. 112). Second, and the most important meaning in this work, as defined by Professor Timmons, is those institutions through which group action affects individual choice and action with respect to resource use (60, pp. 232-234).
regarded as an increase in real income per capita without any significative change in the structural setting of the economy.

However, the GNP per capita and its annual rate of growth are useful both for international comparisons and for measuring the performance of a country's economy through time. Regardless of its limitations the GNP per capita provides a partial measure of economic development.

The annual rates of growth for the Costa Rican economy are shown in Table 1. It is interesting to note that while the rate of growth of GNP and GI\(^1\) was high during 1950-1962, the per capita figures show a declining trend in the last years which means, according to our definition of economic development, that the process has stopped. However, these rates of growth of the GNP imply that the absolute per capita income rose from approximately $260 in 1950 to nearly $360 in 1963.

The rate of growth during each year of 1950-1962 was not an even one. It was rather erratic, and this pattern of growth seems to be associated with the situation of the external sector of the economy and natural conditions (45).

According to Higgins (26) underdeveloped countries are those having twenty-five per cent or less of the United States' per capita national income. Costa Rica is an underdeveloped country\(^2\) by this

---

\(^1\)The Gross Income (hereafter called GI) includes direct gains and losses that the economy experiences through international trade.

\(^2\)Viner defines an underdeveloped country as a country which has good potential prospects for using more capital, more labour, or more available natural higher level of living. Or, if its per capita income level is already fairly high, it is a country which can support a larger population without lowering its standard of living (68, p. 12).
Table 1. Costa Rica: Annual rates of growth of GNP and GI at constant prices of 1962a

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>GNP</td>
<td>6.5</td>
<td>8.3</td>
<td>5.8</td>
<td>5.2</td>
<td>4.7</td>
<td>3.4</td>
<td></td>
</tr>
<tr>
<td>GI</td>
<td>5.4</td>
<td>7.2</td>
<td>4.8</td>
<td>4.1</td>
<td>3.5</td>
<td>3.2</td>
<td></td>
</tr>
<tr>
<td>GNP per capita</td>
<td>2.7</td>
<td>4.4</td>
<td>2.0</td>
<td>1.4</td>
<td>1.0</td>
<td>-0.3</td>
<td></td>
</tr>
<tr>
<td>GI per capita</td>
<td>1.6</td>
<td>3.4</td>
<td>1.1</td>
<td>0.4</td>
<td>-0.2</td>
<td>-0.5</td>
<td></td>
</tr>
</tbody>
</table>

aData from (45).

measure.

B. The Agricultural Sector and Economic Development

In general, developing countries are characterized by economies with a backward agricultural sector which harbours a high proportion of the country's labor force and a low sectorial contribution to the GNP, i.e., agricultural low per capita productivity. In other words, agriculture under these circumstances is retarding overall economic development in terms of productivity per caput.

It is difficult to conceive of economic and social development of a country leaving out such a high proportion of the population in any program of development. Agriculture, and specially backward agricultures, can play a key role in the process of economic development. However, as Christensen points out, if agriculture is going to contribute effectively to national economic development, productivity per person in agriculture must be increased (10, p. 26).
Increased productivity is essential for several reasons. First, to supply an economic surplus that can be consumed or used for further production in agriculture or transferred out of agriculture to provide capital for non-agricultural development and to meet expanding consumption needs to the urban population. Second, to make possible the release of labor and other sources for use in the non-agricultural sectors.

Third, to increase the purchasing power of rural people and thus to expand the market for industrial goods. Finally, but not the least important, to improve the balance of payments bill of the nation through both greater opportunities of agricultural exports and import substitutions of agricultural and non-agricultural commodities.

It is worth emphasizing that agricultural contribution to overall economic development is conditioned to a great extent by the performance of the non-agricultural sectors of the economy which must be capable of absorbing resources so released by agriculture and supplying the required goods and services to this sector. However, since the main interest of this work is to stress the sectorial contribution of agriculture to national economic development, effort is concentrated in the former.

As indicated earlier, the contribution of agriculture\(^1\) to the growth of the Costa Rican GNP was the lowest of all sectors in per capita terms. This situation is illustrated in Table 2. The per capita rate of growth of agriculture was lower than in any other sector.

\(^1\)This concept includes agriculture, cattle, silviculture and fishery (42, p. 127).
Table 2. Costa Rica: Per capita annual rates of the GNP by sectors in constant monetary units of 1962\(^a\)

<table>
<thead>
<tr>
<th>Period</th>
<th>Total</th>
<th>Agriculture</th>
<th>Manufacture</th>
<th>Construction</th>
<th>Government</th>
<th>Others(^b)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1950-1962</td>
<td>2.7</td>
<td>0.6</td>
<td>3.6</td>
<td>2.7</td>
<td>8.2</td>
<td>-</td>
</tr>
<tr>
<td>1959-1962</td>
<td>3.6</td>
<td>0.5</td>
<td>4.4</td>
<td>3.7</td>
<td>11.0</td>
<td>4.6</td>
</tr>
<tr>
<td>1957-1962</td>
<td>2.4</td>
<td>1.9</td>
<td>2.4</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>1959-1964</td>
<td>1.7</td>
<td>-1.0</td>
<td>6.3</td>
<td>4.9</td>
<td>2.2</td>
<td>1.6</td>
</tr>
<tr>
<td>1962-1964</td>
<td>2.4</td>
<td>-3.7</td>
<td>11.5</td>
<td>9.7</td>
<td>1.6</td>
<td>3.0</td>
</tr>
</tbody>
</table>

\(^a\)Data from (42; 43; 44; 45).

\(^b\)Includes commerce, services, housing rents, transport and energy.
in any of the periods under consideration. After 1962, the agricultural rate of growth became negative. This sharp fall in this sector is explained to a great extent by adverse natural conditions during 1963 and 1964\footnote{In fact, during these two years the Irazú Volcano was erupting ash which affected mainly crops and livestock.}. Though the rate of growth of the agricultural GNP was low in per capita terms, the absolute annual rate of growth was rather high - 4.4. An exceptionally high annual rate of population growth (3.8), however, makes the per capita rate of agriculture look very low.

In 1950 about 68.0 per cent of the total population of Costa Rica lived in rural areas while 59.3 per cent of the labor force was engaged in some agricultural activity. The figures for the same concepts were, respectively, 65.6 per cent and 53.0 per cent in 1962. The per capita productivity in agriculture ranks as the lowest in a five-sector-classification during the 1950-1962 period, and as compared to the non-agricultural sectors it is one half and even one third of that achieved in the non-agricultural sectors.

This situation which is explained in Table 3, also points out the disadvantageous position of agriculture with respect to other economic activities.

The percentage of growth of agricultural per capita productivity, while not being the lowest in the economy, showed a very weak percentage of growth, and, again it is just a fraction of the sectors that showed greater dynamism during the period, namely, industry, services and others. The low level of agricultural productivity in Costa Rica and its rather static condition is hampering development in terms of per
## Table 3. Costa Rica: Sectorial productivity and their growth in 1950 and 1962, in constant prices of 1962

<table>
<thead>
<tr>
<th>Sectors</th>
<th>Productivity in U.S. dollars</th>
<th>Percentage of growth</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1950</td>
<td>1962</td>
</tr>
<tr>
<td>Total</td>
<td>835</td>
<td>1235</td>
</tr>
<tr>
<td>Agriculture</td>
<td>557</td>
<td>722</td>
</tr>
<tr>
<td>Manufacture</td>
<td>1294</td>
<td>2026</td>
</tr>
<tr>
<td>Construction</td>
<td>761</td>
<td>918</td>
</tr>
<tr>
<td>Commerce</td>
<td>1529</td>
<td>1862</td>
</tr>
<tr>
<td>Services and others</td>
<td>1149</td>
<td>1863</td>
</tr>
</tbody>
</table>

**Notes:**
- Data from (42, p. 136).
- Sectorial GNP divided by sectorial labor force.
- Includes: services, government, energy, transport, mines and quarries.

Costa Rica obtains almost all foreign currency from the export of agricultural foodstuffs - 94 per cent in 1950 and around 90 per cent in 1962 - from which three products, coffee, bananas, and cocoa, represented 86 per cent of the country's total exports. Prices of these commodities in the world market have not only been subject to high fluctuations but also have showed a declining trend in the last years. Thus, for example, coffee which accounted for about 50 per cent of total exports in 1962 experienced prices one third higher in 1951-1957 than in the early 1960's. The quantum of export of coffee was three times higher

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in 1962 than in 1950 while its value was U.S. $18 million in the latter year and U.S. $46 million in the former. On the other hand, bananas' price declined 10 to 15 per cent in 1950-1962 and its volume in 20 per cent (42, p. 7). These two facts — price fluctuations and its declining trend — have exerted a negative influence in the developmental process in Costa Rica.

An explanation for backwardness of the Costa Rican agriculture in the past is the defects in agrarian structures that are blocking agricultural development, and, therefore, are hampering the overall economic development.

C. Agrarian Reform and Economic Development

According to Professor Timmons, "any improvement in the agrarian structure which covers the institutional framework of agricultural production, is an agrarian reform." He includes:

In the first place, land tenure, the legal or customary system under which land is owned; the distribution of ownership of farm property between large estates and peasant farms or among peasant farms of various sizes; land tenancy, the system under which land is operated and its product divided between operator and owner; the organisation of credit, production and marketing; the mechanism through which agriculture is financed; the burdens imposed on rural populations by governments in the form of taxation; and the services supplied by governments to rural population, such as technical advice and educational facilities, health services, water supply and communications (64, pp. 4-5).

If agrarian reform so defined is going to be a means to improve the economic performance of agriculture, the role of it must be evaluated in terms of overall economic development. The same nature of the economic process as explained by the means — ends-continuum (Chapter III) makes imperative that agrarian reform measures be
considered in terms of their effects on overall economic development. The importance of this interrelationship is emphasized by Barrow when he asserts that:

For the most part the relationship between (agrarian) reform and economic development has suffered from inadequate attention and the failure of (agrarian) reformers to really accept economic development as one of their goals (4, p. 117).

If reformers are concerned only with the attainment of distributive justice or some particular political objectives their progress may have only an incidental impact on economic development (4, pp. 180-187).

The close relationship between economic development and agrarian reform has been widely stressed by different authors (53; 59; 10; 20; 6; 4). Some of them regard agrarian reform as a prerequisite to economic development; others consider it as a partial consequence of it.

However, as Fitzgerald says:

Economic development...is at once an essential prerequisite to (agrarian) reform and a partial consequence of it. In this country we have a saying...for which nobody has a concise answer, namely: 'which comes first, the hen or the egg?' But we do not need to have an answer to this academic question in order to improve our poultry population and to improve both the quality and quantity of our egg production. Similarly we do not need to answer the question of which comes first, economic development or (agrarian) reform (17, p. 385).

As Cittinger points out, "No meaningful, sharp separation of economic development from agrarian development or agrarian reform is possible. In practice, the only separation comes simply because the vastness of the problem demands a small area of the whole complex be singled out for concentration if effort is not to be dissipated uselessly" (20, p. 240).

Similarly,

The interrelationships among the institutional forms of rural society and between them and agricultural production are such
that no one agrarian reform measure can be properly evaluated without considering its effects on other aspects of agrarian life (20, p. 235).

For instance, a land redistribution program must be planned and evaluated, keeping in mind that credit may be necessary to replace the landlord capital as well as to enable the new owner-cultivators to organize their units for optimum production. Since the land redistribution program will draw on the general resources of the society and its effects will influence economic and social development, then the redistribution program must be evaluated in terms of the effect on economic and social development of the country as a whole (20, p. 235).

The concepts stated above are to emphasize basically two things. Agrarian reform\(^1\) offers one of the most promising roads to development. On the other hand, it must not be considered a panacea by and of itself; rather it has to be evaluated in terms of overall economic development.

In 1965, Costa Rica submitted a national plan for economic and social development in accordance with the Charter of Punta del Este. In this plan an annual GDP rate of 6.5 per cent increase is the growth target\(^2\) fixed for a 10 year period. In order to meet this growth rate, agricultural production should yield an annual growth rate of 7.0 per

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\(^1\) Land reform has been generally used in the economic literature interchangeably with agrarian reform, and sometimes both concepts has been equated with land distribution. In this work "land reform" means a reorientation of the control of land (20, p. 122). Reforms as defined by Professor Timonen "are viewed as massive institutional changes" (59, p. 87). Agricultural development is the processes resulting in increased per capita real income and a more widespread per capita real income for those individuals who are dependent upon the agrarian sector of the economy for their means of livelihood.

\(^2\) "Target" means the translation of goals into specific objectives to be accomplished.
cent (45, pp. 45-62). The proposed rate of growth for the GNP is similar to that of the period 1950-1962 and therefore, it seems to be within the country's possibilities. However, the annual rate of growth for agriculture is quite higher than the experimented in 1950-1962, meaning that this achievement, if possible, would require among other things an improvement in per capita productivity in this sector which, in turn, means that changes in agrarian structures are necessary.

D. Structures Within the Agricultural Sector

Most of the economic activities are carried on within the limits imposed by existing institutional arrangements. These institutions can be a facilitating or restraining vehicles for economic units to maximise their objective functions. Nevertheless, with few exceptions, economic theory has ignored institutions or has taken as given the institutional setting "within which economic decisions are made and with which economic decisions are implemented" (60, p. 169).

J. R. Hicks, one of the most influential economists of this century, gives an important observation on the role of institutions in economic analysis:

"Another more important limitation... (of his book) is that it is) without any inclusion of reference to institutional controls. I shall interpret this limitation pretty severely. For I consider the pure logical analysis of capitalism to be a task in itself, while the survey of economic institution is best carried on by other methods such as those of the economic historian (even when the institutions are contemporary institutions). It is only when both of these tasks are accomplished that economics begin to near the end of its journey" (25, p. 7).

He proceeds to say, "It must be realised, indeed, that, as the price of this austerity, the purely theoretical economist becomes unable
to say that any opportunities or dangers he diagnoses are or are not present in the actual world, at any particular date. He is bound to leave that to a separate investigation" (25, p. 7).

Thus, Hicks, while recognising the relevance of institutions in economics, eliminates them "as an economist and consigns their analysis to separate investigation" (60, p. 170). However, these separate investigations are only occasionally made, and, as a result, institutions for the most part remain outside of the economic analysis. A similar viewpoint to that of Hicks is held by T. W. Schults but referred to agriculture:

"The formation of policy in any meaningful sense presupposes a...set of institutions for maintaining and changing policy... [and] the prevailing institutions made possible order and continuity in the formation of policy... [however, he considers] the purpose, strength and weakness of these traditions and institutions are not the burden of these studies" (51, p. 6).

Exclusion of institutions from economic analysis, and their impact on the problems economics pursue to solve, indicates the need for extending economic analysis to include institutions as forces that can be either an obstacle or a facilitating means for the achievement of society’s goals. "The generalised role of land tenure institutions in agriculture and national development" as stressed by Professor Timmons "is to facilitate and not to hinder the achievement of developmental goals set by and for a country" (59, p. 86).

Defects in agrarian structures may result in resource inefficiencies within the agricultural sector and between agriculture and non-agricultural industries. In addition, as stated before, "within the agricultural sector, land tenure institutions affect productivity per worker
and hence the potential market for non-agricultural products and services, capital, and labor to be released for other sectors" (59, p. 86).

In less developed countries the institutional setting within agriculture seems to be an extremely serious obstacle to economic development. Thus, for instance, "The United Nations reported in 1954 that 'major reforms' of various sorts were needed in almost every area of the Free World except the temperate regions of North America and Northern Europe" (20, p. 251). Costa Rica does not seem to be an exception to this structural situation in agriculture. In fact, problems of minifundia and latifundia, input and output markets, uncertainties arising from uncertainty of tenure, lower uses of land arising from pattern of ownership, occupational immobilities, capital use and capital formation, low level of technical education, etc., are stressed by different authors (41; 42; 7; 39; 33).

The correction of these structural defects within the agrarian sector so as to make possible the attainment of the development goal would make of necessity the use of both structural or institutional changes and instrumental changes\(^1\). They are considered as variables in the developmental process and are subject to governmental intervention in the interest of society.

\(^1\)Institutional or structural changes are major shifts in the forms of ownership and control over productive factors and the distribution of income. Instrumental changes applied to land tenure institutions are regarded as small (but more frequent) changes in such things as rental rates, interest rates, amortization rates, factor-product rates, wage and factor values, which are possible through the creation and development of institutions permitting changes in instruments (59, pp. 86-87).
E. Structural Effects upon Agriculture and National Economy

Agriculture, as stated above, can play a key role in the achievement of overall economic development in today's underdeveloped countries. Productivity per capita in developing countries is low, and, furthermore, quite static. Within agriculture, land tenure institutions affect productivity per worker which means that a movement toward the improvement of the institutional setting will result in an increase in per capita productivity.

The essential elements of agrarian reform proposed in Chapter III provide a framework for the analysis of the obstacles to agricultural development and hence partially to economic development. Agrarian reform implies structural changes in agrarian institutions. These changes can be achieved by pacific or by violent means. While pacific structural changes are attained through legislative, executive and court actions, violent institutional changes generally come about by revolution if change is not "sufficient in kind and temp to maintain the stability threshold" (59, p. 87).

According to Professor Timmons, "Changes in land tenure institutions, particularly when made abruptly, may result initially in decreased per capita productivity in agriculture and, as a result, impair national development" (59, p. 86).

In October 1961, the Costa Rican government enacted the Land and Land Settlement Law designed as a means toward the improvement of the agricultural situation. The law makes provisions for institutional changes in agriculture and, therefore, it has relevant implications for the economic development of the country. The analysis of the law as a
vehicle to fill the gap between the developmental goal and agricultural pre-law days is one of the main endeavors of this work.
III. THE ANALYTICAL FRAMEWORK

In this chapter both the conceptual approach to the analytical framework and formulation of hypotheses on the basis provided by the former scheme are considered. These hypotheses are useful as a means for directing and controlling the inquiry in this study.

A. Conceptual Approach

The identification and analysis of defects in land tenure structures which obstruct agricultural and overall economic development can be more revealing if pursued through the use of a conceptual framework. As stated in the foregoing pages, the generalized role of land tenure structures is to facilitate and not to obstruct the attainment of societal goals.

A framework specially suitable for the identification, development and testing land tenure structures as variables in the development process is what John Dewey terms the "means-ends-continuum". This scheme "emphasizes the dynamic nature of social problems which are continually in process of change" (61, p. 7). According to Dewey, "Every social phenomenon...is itself a sequential course of changes, and hence a fact isolated from the history of which it is a moving constituent loses the qualities that make it distinctively social" (14, p. 501). Ends as interpreted by John F. Timmons, perform a twofold function in social inquiry. They serve to establish the norm from which the problematic situation may be determined as the gap between the norm and the present situation. They also serve as criteria for evaluating particular means to determine the degree to which the yield
consequences are in line with the ends (61, p. 13).

Within the "means-ends-continuum" framework, ends rank in accordance to their importance in the attainment of basic ends. Thus some ends are simply means to more ultimate ends. Others are really ends-in-view for lower ends. The relative position of ends is such that "...every immediate goal or end becomes an end-in-view in relation to a more ultimate goal until the basic ends are reached. Each end-in-view can be looked upon as a means to reach another end-in-view" (20, p. 130).

However, in the last instance all means-ends-continua must be directed toward the attainment of basic ends stated by and for society. These latter ends, stresses Professor Timmons, "are beyond and superior to economic ends," and, therefore, "ends within economics must fit into continua leading to basic ends (61, p. 15). As asserted by Adam, "Presumably the basic ends that are common to all societies," Costa Rica not being an exception, "...are life, liberty and opportunity" (1, p. 26). These ends are not only pragmatically substantiated by national and international enunciations of basic ends (e.g. the United Nations from which Costa Rica is a member) but also they are logically supported by the close interdependence among them. Achievement of one or two of the basic ends in the absence of one or two of the others is meaningless.

In spite of economic development being considered as an end in this work, its relative position in the proposed framework has to be regarded as a means to achieve higher ends. Under the perspective provided by this scheme, agricultural and non-agricultural development are, in turn, means to achieve economic development. In a similar manner, it is possible to go down in the scale until the starting point for this
study, i.e., land tenure structures is reached. It is worthwhile noting that goals are not independent among themselves. Instead they are closely interrelated through competitive and complementary relationships. This means that in some instances maximization of a single end is conflictive with remainder ends. In such cases, as Professor Timmons points out, "The problem is one of proportionality in achievement of goals" (61, p. 19).

Specification of the degree of proportionality is brought about by the weight society assigns to each end. In practice, however, it is very difficult to assess such weights as to obtain a "perfect" balance among ends. Perhaps knowledge of the characteristics of each end and their interrelationships is a valuable guide to attain this balance. Thus in the case of agrarian reform goals, namely political stability, social progress\(^1\), and increased efficiency in all resource use, knowledge of the technical nature of the production function of agriculture might give interesting insights for the assignment of weights to individual ends.

Thus far, proportionately has been considered in a static dimension. In a dynamic sense, as stressed by Sittinger, our logical

\(^1\)In this work "social progress" means development of individuals as informed and participating members (to the extent of their inherent abilities) in the social, economic and political life of the country. This involves providing the environment and opportunity for individuals to develop the talents with which they are endowed. Political stability is viewed as an orderly change toward social progress and economic development. This means that the dynamic changes; stresses, and conflicts associated with economic development and social progress may be accommodated within the structure short of serious internal revolutions with their aftermath of chaos, destruction, and disorganization (59, p. 85).
framework should serve as a basis to solve the conflict between ends-in-view where "the extent to which each is emphasised and the criteria for balancing one end-in-view against another are the more ultimate ends-in-view" (20, p. 130).

The evaluation of the process of change caused by structural changes in the land tenure system make of necessity the development of a conceptual framework allowing for the appraisal of particular means in terms of their contribution to the developmental goal. In Figure I this scheme is illustrated. It endeavors to describe basically the functional relationship between agrarian development and economic development and, of course, their relative position with respect to society's basic ends. Thus, for instance, in this scheme, agrarian development cannot be pursued by actions that violate superior ends. Likewise, achievement of agrarian development implies a deliberated and purposeful change in land tenure structures to attain given ends. The conceptual framework also puts emphasis on the necessity of development in non-agricultural sectors as a means to obtain economic development. However, the analysis for non-agricultural activities is beyond the scope of this work.

The means-ends-continua also provides opportunity for translating goals into targets\(^1\). These targets ought to be stated for the agricultural sector as an integral part of the development goal of the nation, and, hence, they become specific guides for the analysis of land tenure institutions within the agricultural sector. Within this sector targets

\(^1\)This possibility is not explicitly included in the means-ends-continua for the sake of simplicity. Rather it is offered separately in Figure 2.
<table>
<thead>
<tr>
<th>Basic ends</th>
<th>(Economic development)</th>
<th>(Agricultural development)</th>
<th>(Goals of agrarian reform)</th>
<th>(Agrarian reforms)</th>
<th>(Essential elements of agrarian reform)</th>
<th>(Examples of land tenure defects)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Life</td>
<td>Subsistence norm</td>
<td>Increased efficiency of labor</td>
<td>Increased efficiency of capital</td>
<td>Increased efficiency in the use of land in agriculture</td>
<td>Structural changes in land tenure institutions</td>
<td>Minifundia and latifundia</td>
</tr>
<tr>
<td></td>
<td>MVP rewards</td>
<td>Sustained increase per capita real income in agriculture</td>
<td>Increased efficiency of capital in agriculture</td>
<td>Increased efficiency in the use of land in agriculture</td>
<td></td>
<td>Lack of security over land resources</td>
</tr>
<tr>
<td>Opportunity</td>
<td>Increased efficiency of capital</td>
<td>More wide spread per capita real income in agriculture</td>
<td>Social progress</td>
<td>Instrumental changes in land tenure institutions</td>
<td>Knowledge</td>
<td>Dissociation between human effort and MVP rewards</td>
</tr>
<tr>
<td></td>
<td>Increased efficiency through adjustments in economic and social institutions</td>
<td>Increased efficiency through dissemination of information</td>
<td>More wide spread per capita real income in agriculture</td>
<td>Political stability</td>
<td>Capital formation and access to capital</td>
<td>High costs of operation and ownership</td>
</tr>
<tr>
<td>Liberty</td>
<td>More wide spread per capita income</td>
<td></td>
<td></td>
<td></td>
<td>Illiteracy</td>
<td>Lack of technical education</td>
</tr>
</tbody>
</table>

Figure 1. Means-ends continuum
(1) 3.6 per cent per capita annual growth of agricultural GNP as needed to achieve 2.7 per cent in GNP of the nation.

(2) U.S. $177 million of investment in social overhead capital in 1965-1968 as needed to yield the social progress component of national development.

(3) Specific changes in structures as to preserve and improve the political component of economic development.

Figure 2. Relationship among targets, instruments and institutions as applied to Costa Rica
are pursued through the means of institutions and instrumental changes. In Figure 2 the relationship among targets, instruments and institutions is illustrated through its specific application to Costa Rica. Targets in this example are those specified in the Costa Rican National Economic and Social Development Plan prepared by the National Planning Office of the nation. Institutions within the agricultural sector are represented by the Law, which supposedly will permit both the fulfillment of the agricultural contribution to the developmental goal and the functioning of instruments. In Figure 2 the connection between agricultural and non-agricultural industries is again emphasized. Side effects may have favorable or unfavorable impact in the end result of a given course of action.

It is hoped that the conceptual framework proposed in this section not only permits us to point out the essential elements of development but also to understand what Schumpeter calls the "describing mechanism" of each of these elements. This mechanism emphasizes the necessity, which is often overlooked, of inquiring carefully into the *modus operandi* of every factor that observation may suggest as significant. The analysis of the *modus operandi* of a factor is frequently the best, and sometimes the only method, for establishing the significance of a given candidate for the role of factor and for forming a rational opinion regarding its comparative weight. In addition, it is the most obvious remedy in cases where no definite effect, no even sign (direction), can be predicated of a factor for once and all. Factors can affect favorably or unfavorably development depending upon the "circumstances" of each case. But this remains a loose and unenlightening phrase unless
we specify a *scheme of possible modi operandi* that tells us which are the "circumstances" to watch and which will produce which effects (94, pp. 5-6).

### B. Formulation of Hypothesis

In the foregoing section a formal representation of hypothetical propositions was developed. This same conceptual model is useful as a means for directing and controlling the inquiry of this study through the formulation of specific hypotheses. The segment of interest in this work within the means-ends-continuum scheme gives the norm from which hypothesis can be formulated on the basis of the interrelationship among goals, means and consequences. The goal set for this work is economic development, concept that encompasses basically two objectives: a) sustained increased per capita of goods and services and b) more widespread per capita income distribution. It makes a logical necessity that achievement of agricultural development, which stands as an end-in-view for agrarian reform, must be pursued by means not in contradiction with the developmental goals. Likewise, the developmental goal places restrictions in the meaning and content of agricultural development.

Timmons suggests three categories of hypotheses as directors of inquiry for the analysis of the role of land tenure structures in agrarian development: problem delimiting hypotheses, diagnostic hypotheses and, remedial hypotheses.

Problem delimiting hypotheses endeavor to determine the extent particular land tenure structures obstruct and prevent the achievement of the developmental goal within agriculture and the nation. In this
study these hypotheses will delimit the consequences of specific land
tenure structures in terms of the essential elements of agrarian reform,
namely, incentives, knowledge and, capital.

Diagnostic hypotheses seek to explain how and why particular land
tenure structures either have led to consequences short of the develop-
mental goal or have contributed to the achievement of it. In that manner
they advance possible reasons of cause and persistence of the problem
previously delimited. Therefore, this kind of hypotheses must be designed
to answer questions such as:

1. How and why do particular land tenure institutions affect
adversely or favorably the incentives for cultivators to increase their
productivity, given ample capital and knowledge?

2. How and why do particular land tenure institutions affect
adversely or favorably knowledge in the form of technical and managerial
innovations in agriculture, given ample capital and incentives?

3. How and why do particular land tenure institutions affect
adversely or favorably the formation of capital or access to capital,
given the incentives to use capital and the necessary technical and
managerial knowledge?

Diagnostic hypotheses provide the basis for development of remedial
hypotheses which are of a corrective nature. Their function is twofold:
a) removal of failure elements identified and measured in the diagnostic
stage and b) expansion of success elements detected in the diagnostic
phase and development of new success elements (59, pp. 87-91; 61, pp.
24-26).

The main role of the foregoing hypotheses is to guide the inquiry
so as to permit the identification, evaluation and development of alternative land tenure structures as means for the attainment of the objectives of agrarian development. These same objectives set the efficiency criteria through which the performance of land tenure structures as a means for resource allocation must be tested. It ought to be advanced, however, that the empirical verification of the hypothesis to be formulated later on cannot be carried out since data required for such procedure is not yet available. As stated before land tenure structures affect productivity per worker within the agricultural sector. This relationship, alternatively means both that land tenure structures determine the existence of the essential elements of agrarian reform which, if not, would allow the attainment of the objectives of agricultural development, i.e., sustained increase per capita real income and more widespread per capita real income in agriculture, and, that agricultural stagnation is directly affected by agrarian structural defects which hinder sectoral development.

The assumption in this work is that land tenure structures do not provide enough incentives for farmers to maximize their returns in a way compatible with the developmental goal. The existence of specific structural defects in the agrarian sector may also hamper the adoption of new technologies and prevent innovations in management practices. Similarly, capital formation and capital use under certain agrarian structures may be adversely affected.

Since the basic goal in this work is economic development, concept that implies a sustained increase in real per capita income and more widespread real per capita income, land tenure structures will be
evaluated in terms of their ability to bring about an increased efficiency in the use of factors of production and the distribution of the product coming from it which, in turn, becomes a prerequisite for the attainment of non-material goals.

Hypotheses for the identification, evaluation and development of land tenure structures are formulated in such a way that the analysis of agrarian structures may be carried out by using economic principles. These principles serve as guides for the analysis of the role land tenure structures must play in the achievement of the pursued goals. Furthermore, "it is here, and in its instrumental capacity, not as a master but as a servant of...research, that theory may prove useful" (A., p. 9).

With the proposition that defective land tenure structures exert a limit on the possibilities of development in mind, specific hypothesis can be formulated:

A. Delimiting problem hypotheses seek to explain the extent particular land tenure institutions prevent the achievement of the developmental goals within agriculture and the nation. Up to the early 1960's the Costa Rican agriculture was characterized by a low per capita productivity as compared to other sectors of the economy. In fact, agriculture shows the lowest figure for this concept within the economic system of the country and, furthermore, its per capita annual rate of growth is also one of the lowest on a sectorial basis. Even though the remainder sectors both have experienced a higher rate of growth than agriculture did and, their possibilities of growth are fairly good with the participation of Costa Rica in the Central American Common Market,
presumably agriculture is hampering a more dynamic non-agricultural
development in terms of the resources agriculture can release for use
in other sectors, prices and amount of foodstuffs and raw materials for
internal consumptions and exports from which the country obtains around
90 per cent of the foreign currency and, finally, to support a very
high population increase. In 1961 the Costa Rican government enacted a
Law which is supposedly designed to improve the agrarian structural
setting within which agriculture is carried out. This Law ought to be
considered as a recognition from part of the national government of the
existence of defects in agrarian structures which were hindering a more
dynamic growth of the country's economy.

In this work the problem delimiting hypothesis will identify the gap
between present situation, i.e., the situation previous to the enactment
of the Law, and, the developmental goal, or, more specifically, the
target the Economic and Social Development National Plan has assigned to
agriculture. The means to cover the route between present situation and
goal will be the Law.

B. Diagnostic hypothesis are designed to identify and measure the
extent particular land tenure structures can facilitate or obstruct the
achievement of the pursued goal. In other words, they seek to explain
the gap between present situation and goal. The essential elements of
agrarian reform (Figure I) provide a framework from which obstacles for
agricultural development can be identified. These elements are:
incentives, for cultivators to increase their productivity, knowledge in
the form of technical and managerial innovations and capital formation
and access to it. For example, the existence of squatters in the
Costa Rican agriculture brings about uncertainty over future control over land resources thus violating the necessary incentives for farmers to increase their productivity. Minifundia in the Central Plateau of the country prevents the use of techniques yielding higher level of production and income to farmers, and which also hinders the adoption of technological innovations. Similarly, latifundia might be the cause of capital leakages in agriculture which, in turn, might be preventing a higher rate of capital accumulation in this sector.

Diagnostic hypothesis seeking to identify and measure the problematic situation can be derived on the basis of the essential elements for agricultural development as follows:

a. Given ample capital and technological knowledge, land tenure structures may violate the necessary incentives for cultivators to improve his productivity. These defects affect not only resource owners but also the decision-making process. Two types of structural defects leading to this situation are 1) uncertainty of future control over the land resources, and 2) certainty that he will not be rewarded proportionally to his effort in using his resources. In this study lack of incentives associated with 1) may result from:

1) Uncertainties arising from conditions of tenure.
   1i) Lack of secure title to land.
   1ii) Occupational immobilities.
   1iv) Possible loss of ownership because high fixed mortgage commitments are price and yield uncertainties.

Under these conditions the planning horizon of the cultivator will be shortened, and, as a result, he will be encouraged to use his
resources for either short-run productive purposes or for consumption purposes and as a consequence productivity is adversely affected. Similar consequences are caused by lack of incentives derived from 2) and which applied to this work refer to defects in lease arrangements.

b. Given necessary incentives and access to capital, improved productivity depends on the level of technological knowledge and adoption of technological innovations as determined by land tenure arrangements. In this study the effect of these arrangements on the use of a more economically efficient technological level will be referred to as the impact of technology and, lower uses of land arising from the pattern of ownership. Here it is made the assumption there is a substantial reservoir of technological knowledge ready to be used and, which will be adopted by farmers if structural defects are corrected. It also implies, among other things a given level of farmers' knowledge and education as to understand, adopt and, put into practice these techniques. These assumptions, of course, are not always present in the real world of underdeveloped countries. Given these factors are important in the development process they will be briefly commented when the hypotheses be specifically applied to the Costa Rican situation.

c. Given incentives and knowledge, land tenure structures adversely affect capital use and capital formation in agriculture.

Defects in land tenure structures within agriculture may hinder capital formation and capital use through high fixed costs of ownership and operation, factor and product markets, land values higher than justified by land productivity and lack of opportunity to channel savings into productive activities. High fixed costs of ownership
(interest, amortization payments, taxes, etc.) and high costs in operating land (rents, services and dues, interest on operating capital, etc.) tend to reduce savings of farmers which, in turn, affects potential capital formation and capital use. Some defects in land tenure structure are in connection with the external supply of capital which the agriculture sector (or individual farmers) faces while others refers to the internal (within the agricultural sector or individual farms) supply of capital. Thus, for example, squatters' lack of titles (uncertainty of tenure) prevent access to outside capital where property security is needed.

C. Finally, the remedial hypothesis, being of a corrective nature, serve as a basis for suggesting alternative modifications in land tenure structures in line with the pursued goals. Success and failure elements in land tenure structures which will determine the acceptance or rejection of specific structures are evaluated through the criteria of incentives, knowledge and capital.

The distinction made of agrarian structures as affecting each of the essential elements of success - capital, knowledge and incentives - is not clear cut. Thus, for example, uncertainty arising from lack of secure title not only adversely affects the decision-making process but also it obstructs access to outside capital when real state security is needed for loans. Therefore, this division is conventional and, it is assumed, helpful for the analysis. The application of the foregoing hypothesis to the Costa Rican situation as proposed in Chapter I, requires knowledge of the problems affecting agriculture in the pre-settlement Law days as well as objectives and provisions of the Law. This will be the purpose of next chapters.
IV. THE AGRARIAN SITUATION IN COSTA RICA
BEFORE THE LAND AND LAND SETTLEMENT LAW

Before the analysis of the Law as a means to achieve the goals of agricultural development and, hence, its contribution to economic development, it is necessary to examine some aspects of Costa Rica before the enactment of the Law. In this setting the land tenure system of the country, the population problem as well as the major objectives and provisions of the Law are reviewed.

A. General Aspects

Costa Rica – the second smallest country of Central America – has an area of approximately 5 million hectares while her population was about 1.3 million in 1969. It has two well-defined topographic zones: the central portion which is mountainous and the coastal regions with extensive plains. "There are three principal climatic zones: the humid tropical zone of the Atlantic coast, the central intermontane with a mild climate, and the tropical of the Pacific coast, with well-defined rainy and dry seasons" (9, p. 11). The physiographic regions of Costa Rica are illustrated in Table 4, and they also can be identified in the attached map of the country (42, p. 15).

The Pacific and Atlantic zones where only one third of the population is settled account for more than 75 per cent of the country's total area. Two thirds of the population live in the Central region which accounts for about 30 per cent of the total area of the nation. Moreover, the population density is the highest in the Central Plateau and adjacent areas where 50 per cent of the population is settled in only 10 per cent
Table 4: Physiographic regions of Costa Rica

<table>
<thead>
<tr>
<th>Sub-zones</th>
<th>Atlantic zone</th>
<th>Central zone</th>
<th>Pacific zone</th>
<th>Percent of country's area</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Square kilometers</td>
<td>Square kilometers</td>
<td>Square kilometers</td>
<td></td>
</tr>
<tr>
<td>North Atlantic</td>
<td>10.275</td>
<td>8.498</td>
<td></td>
<td>20.0</td>
</tr>
<tr>
<td>Mountain range</td>
<td>8.061</td>
<td>2.256</td>
<td></td>
<td>15.6</td>
</tr>
<tr>
<td>Central Pacific</td>
<td>4.376</td>
<td>3.521</td>
<td></td>
<td>8.6</td>
</tr>
<tr>
<td>North Pacific</td>
<td>11.824</td>
<td></td>
<td></td>
<td>23.2</td>
</tr>
<tr>
<td>Valle del General</td>
<td>2.077</td>
<td></td>
<td></td>
<td>4.1</td>
</tr>
</tbody>
</table>

*Data from (42, p. 2).

of the country's area (43, p. 13).

This pattern of settlement is a result of historical, health, climatic and similar considerations. As a consequence of it most of the economic activities are concentrated in this region. Thus, for example, around 84 per cent of the country's commercial transactions were carried out in this region in 1957. Figures for investment in overhead capital, industrial concentration, employment, etc., are either similar or even higher to those of commerce (45, p. 26; 44). The settlement of the country has not been completed yet and, partially because of the high population pressure in the Central region of the nation - as a result of the high population growth - there has been a trend for it to move toward regions out of the Central Plateau, in the last decades.

Up to 1963, the country had in reserve lands potentially available for crops and livestock, a greater area than that under cultivation. A
breakdown of land use in Costa Rica in 1950, 1955 and 1963 is given in Table 5. The amount of land the country has devoted to crop and livestock almost has doubled during 1950-1963. Expansion in the area used for coffee, cocoa, sugar cane, rice, beans and livestock, basically, have accounted for this increase in area under use. Regardless of this high increase in land use during 1950-1963, the area potentially available for agricultural purposes is so far quite higher than that already under use.

The reader would have a better view on land use in Costa Rica if he would know the allocation farmers have given to land. This situation is illustrated in Table 6 on the basis of data from the agricultural census of 1950, 1955 and 1963. It is interesting to note that farm land and permanent crops only accounted for nearly 20 to 23 per cent of the total farming area during 1950-1963. Furthermore, if idle land is subtracted from farm land this percentage would fall to the 15 to 20 percent range. A look at the structure of the components of farm land, shows us that idle land was the concept that increased the most in the period under consideration. On the other hand, from 3% to 39 per cent of the area of farms was used for permanent pastures under which most of the livestock is supposedly fed. The share of livestock in the agricultural GNP was nearly 10 per cent in 1963, the year in which it was the highest. It shared about 5 and 7 per cent in 1950 and in the mid 1950's, respectively.

These two concepts - idle land and permanent pastures - can be an important source of land which can be incorporated almost immediately in the agricultural productive process, given these areas, in general terms,
Table 5. Land use in Costa Rica in thousand of hectares and per cent in 1950, 1955 and 1963

<table>
<thead>
<tr>
<th>Concept</th>
<th>1950</th>
<th></th>
<th>1955</th>
<th></th>
<th>1963</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Thousand</td>
<td>%</td>
<td>Thousand</td>
<td>%</td>
<td>Thousand</td>
<td>%</td>
</tr>
<tr>
<td>of the country</td>
<td>hectares</td>
<td></td>
<td>hectares</td>
<td></td>
<td>hectares</td>
<td></td>
</tr>
<tr>
<td>(1) Total area of the country</td>
<td>5090.0</td>
<td>100.0</td>
<td>5090.0</td>
<td>100.0</td>
<td>5090.0</td>
<td>100.0</td>
</tr>
<tr>
<td>(2) Crop and livestock</td>
<td>951.9</td>
<td>18.9</td>
<td>1290.2</td>
<td>25.5</td>
<td>1775.4</td>
<td>34.9</td>
</tr>
<tr>
<td>(3) Urban areas, roads, rivers, lakes</td>
<td>445.2</td>
<td>8.7</td>
<td>505.3</td>
<td>9.9</td>
<td>617.1</td>
<td>12.1</td>
</tr>
<tr>
<td>(4) Sub-total (2) (3)</td>
<td>1397.1</td>
<td>27.6</td>
<td>1803.5</td>
<td>35.4</td>
<td>2392.5</td>
<td>47.0</td>
</tr>
<tr>
<td>(5) Area available (1)-(4)</td>
<td>3692.9</td>
<td>72.4</td>
<td>3286.5</td>
<td>64.6</td>
<td>2695.5</td>
<td>53.0</td>
</tr>
<tr>
<td>(6) Forest and woodlands</td>
<td>576.9</td>
<td>11.3</td>
<td>541.6</td>
<td>10.6</td>
<td>535.6</td>
<td>10.5</td>
</tr>
<tr>
<td>(7) Area potentially available</td>
<td>316.0</td>
<td>61.1</td>
<td>2744.9</td>
<td>54.0</td>
<td>2161.9</td>
<td>42.5</td>
</tr>
</tbody>
</table>

*Data from (43).*

already have the necessary basic overhead capital investments. Idle land and permanent pastures are in connection with "our" concept of lower uses of land arising from the pattern of ownership which has been previously identified as a defect in land tenure structures.

The per capita caloric food intake levels of Costa Ricans experienced a deterioration during 1950-1962. While the level was 2440 calories a day per person in 1950 it declined to 2170 in 1962.
Table 6. Per cent of number of farms and area under different tenure systems in Costa Rica in 1950, 1955 and 1963b

<table>
<thead>
<tr>
<th>Tenure system</th>
<th>1950</th>
<th>1955</th>
<th>1963</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Per cent</td>
<td>Per cent</td>
<td>Per cent</td>
</tr>
<tr>
<td></td>
<td>of farms</td>
<td>of area</td>
<td>of farms</td>
</tr>
<tr>
<td>All tenure systems</td>
<td>100.00</td>
<td>100.00</td>
<td>100.00</td>
</tr>
</tbody>
</table>

Single tenures

<table>
<thead>
<tr>
<th>Tenure system</th>
<th>1950</th>
<th>1955</th>
<th>1963</th>
</tr>
</thead>
<tbody>
<tr>
<td>Owners</td>
<td>81.1</td>
<td>69.7</td>
<td>75.5</td>
</tr>
<tr>
<td>Tenant</td>
<td>2.1</td>
<td>0.7</td>
<td>1.4</td>
</tr>
<tr>
<td>Share-crop</td>
<td>1.5</td>
<td>0.2</td>
<td>1.0</td>
</tr>
<tr>
<td>Free</td>
<td>1.8</td>
<td>0.2</td>
<td>2.0</td>
</tr>
<tr>
<td>Squatter</td>
<td>0.9</td>
<td>0.4</td>
<td>1.7</td>
</tr>
<tr>
<td>Settler</td>
<td>0.5</td>
<td>0.3</td>
<td>0.3</td>
</tr>
<tr>
<td>Other</td>
<td>0.8</td>
<td>0.4</td>
<td>2.1</td>
</tr>
</tbody>
</table>

Mixed tenures

<table>
<thead>
<tr>
<th>Tenure system</th>
<th>1950</th>
<th>1955</th>
<th>1963</th>
</tr>
</thead>
<tbody>
<tr>
<td>Owner and tenant</td>
<td>5.1</td>
<td>5.0</td>
<td>5.6</td>
</tr>
<tr>
<td>Owner and share crop</td>
<td>3.0</td>
<td>1.0</td>
<td>4.4</td>
</tr>
<tr>
<td>Other</td>
<td>3.3</td>
<td>2.1</td>
<td>6.0</td>
</tr>
</tbody>
</table>

Data from (42, p. 179).

"These dietetic levels" comments the National Planning Office, "point out something already known: nutritional deficiency in the population" (42, p. 2). These levels of caloric food intake represented in 1962 only 80 to 85 per cent of the recommended diet for the country. Moreover, deficiencies in other dietetic elements such as vitamins and
minerals are also of a similar magnitude. These low levels of nutrition of the Costa Rican population violates one of the essential elements for economic development stated in the means-end-continuum: the subsistence norm\(^1\). This problem calls for both an income redistribution which can be brought about, at least partially, by rewarding workers according to their marginal value product, land redistribution, etc., and by giving them the opportunity to increase per capita productivity.

B. The Land Tenure System

The land tenure setting of Costa Rica reveals peculiarities, most of which are common to other Latin American countries. The agrarian situation in pre-Law days is a consequence of a set of factors of a very diverse nature such as political, historical, economic, social, and legal aspects.

For the identification and quantitative evaluation to be made in this section of defective land tenure structures, which supposedly are the causes of inefficient resource allocation, the same order in which diagnostic hypotheses were formulated will be followed.

1. Defects in land tenure structures adversely affect incentives for the cultivator to increase his productivity. Uncertainty over future control of land resources is concerned with four defects which were identified in Chapter III, i.e., uncertainty arising from conditions of tenure, lack of secure title to land, possible loss of ownership because of high fixed mortgage commitments and price and yield uncertainties, and occupational immobilities. The first two defects

\(^1\)“Subsistence norm” in this study means the fulfillment of the technically recommended minimum dietetic levels.
"occur when the tenure pattern is characterized by tenancy" (20, p. 260). Uncertainties arising from conditions of tenure are caused, basically, by short-term leases, lack of compensation and lack of notice to quit.

The occurrence of this defect shortens a farmer's economic horizon, and as a consequence, allocation of resources do not reach an optimum. Fearing he will not realize future benefits, he will lack the economic incentives to allocate his resources in the optimum pattern for his firm, reducing the efficiency of his labor, and violating one of the necessary...[elements] for economic development" (20, p. 261).

It is possible that the very nature of the land situation in Costa Rica - a relative greater land area as compared to land requirements - was an important factor in modeling a pattern of tenure characterized by few tenants. A breakdown of land by type of tenure (Table 6) reveals us the relative importance of different tenure systems by a number of farms and as a per cent of total area in 1950, 1955 and 1963. "Owners" is by far the most important tenure system both by number of farms and by area. Within the single tenure classification, the remainder systems account for less than 5 per cent in either of the percentages illustrated for any of the three years under consideration. Mixed tenures is altogether the second most important tenure system and, it represents from 8 to 15 per cent of both area and number of farms.

Salazar and the Agricultural Planning Office agree that the tenancy setting of the country has not been an outstanding feature of the land tenure system of Costa Rica (49, p. 106; 42, p. 199). In this respect the Planning Office expressed the following opinion:
The Rent and Share-cropping Law of March of 1944, as suggested by its name, regulated contractual relationships between landlords, tenants and share croppers. In practice, however, it had not been applied, not being this omission a serious problem since tenancy systems are not very common in the country (42, p. 199).

It is worth noting two things with respect to the tenancy situation in Costa Rica: 1) even though the system is not widespread in agriculture, it does affect some farmers, and 2) this situation refers to the past and, perhaps, to the near future. In a long run perspective tenancy may become relevant to the country’s agriculture and, this "long-run" may be will not be "very long". Salazar estimates that public domain lands which account for a high proportion of the nation’s reserve of lands "probably will be exhausted within the present generation" (49, p. 2).

The effect of lack of secure title to land on resource allocation is in various ways similar to that of uncertainties arising from conditions of tenure. In addition, lack of secure title to land may restrict the availability of credit for the operator which, in turn, may hamper capital use and hence the optimum resource allocation.

Concerning this structural defect, the pre-Law conditions were exemplified by a widespread occurrence of this defect, an aspect that has been emphasized by different sources (42; 43; 45; 49; 65; 27; 9). Major causes of this defect are in connection with: (a) legal institutions and, (b) precarious occupants (squatters).

Recording land property and land property transfers has been a practice in Costa Rica since the last century. However, it has not been compulsory and, when practiced it has been carried out on a non-technical
basis. It has resulted in all kinds of conflicts and inaccuracies; some of them being so serious as the recording of the same property under different owners" (49, pp. 55-60). So far as public domain lands concern, the situation was similar to that of private lands and as stressed by the same author, "Unfortunately, neither any governmental agency nor any person can provide this information about public domain lands. Nobody knows in the country and, there is no means to know it both immediately and accurately, how much public domain lands does the government own and their location" (49, p. 51).

Squatters are the second cause of this defect in Costa Rica. Although there were not reliable figures concerning the number of squatters in Costa Rica it was estimated there were from 16,000 to 20,000 of them in the early 1960's. They would represent from 8 to 10 per cent of the agricultural labor force of 1962, or, about 2 per cent of the rural population in the same year. Squatters have taken over both public domain lands and private lands.

The first attempt to remedy this problem in Costa Rica was through the Law of Precarious Occupants promulgated in 1942. It pursued to solve the problem by purchasing private lands invaded by squatters and by selling public domain lands to the invaded land's owners. However, the Law went away.

This law, far from being a device for solving the problem... of precarious occupants, instead stimulated the invasion of new lands, action that was not only carried out by landless farmers but was also stimulated by farm owners. The interchange of invaded lands (by squatters) was a bright business in which everybody made a profit: the landlord, who generally sold the land to the government at exceedingly high prices; the "occupants", who sometimes freely received land property even without knowing the land they were supposedly
occupying; and intermediaries who are never absent in this kind of business. The only loser was the Nation... (42, p. 198).

An idea about the magnitude of the problem can be drawn by looking at Table 6. However, an accurate quantitative evaluation of the problem might have been hampered by the same nature of the problem.

Possible loss of ownership because of high fixed mortgage commitments and price and yield uncertainties are factors unfavorably affecting a farmer’s incentives to increase his productivity. In regard to the former defect there was not an attempt to subdue this defect in pre-Law days.

Agriculture, unlike most of the other economic activities, is subject to uncertainties caused by forces which not always are under human control. Among them the most important uncertainties arise from sharp and frequent changes in agricultural yields and prices.

Uncertainties arising from yields are of natural and biological nature such as plant diseases, floods, droughts, hail, wind, etc. Up to the present there has not been an earnest attempt to remedy this structural defect in Costa Rica. "The National Insurance Institute and FAO worked out an 'Experimental Plan on Crop Insurance,' that never was put into practice" (42, p. 224).

In regard to price uncertainty, the government has tried to ameliorate undesirable results arising from seasonal and year-to-year price fluctuations. There is a governmental agency whose main objectives are: (a) to foster agricultural production, (b) to stabilize

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1The name of this agency is Consejo Nacional de Produccion which was established in 1943 (hereafter called the Consejo).
prices of basic agricultural commodities\(^1\) in such a way as to obtain a just equilibrium between consumers and producers\(^2\), and (c) to coordinate and cooperate with other institutions of credit, extension, technical assistance and any other encouraging measure to foster agricultural production (12, p. 3-5). The "Consejo" performs the functions of price stabilization for both producers and consumers. This agency carries out its function by buying directly commodities from farmers at a price which is fixed each year. Should the harvest fall short and producers, retailers or anyone else attempt to bid up prices, the Consejo will sell the necessary quantity of commodities to the market so as to maintain the fixed price. These operations, however, are limited to some basic agricultural commodities. There are other governmental agencies pursuing similar objectives for sugar, coffee, and tobacco.

Occupational immobilities may also cause resource inefficiencies. A lack of suitable alternatives or a lack of knowledge about alternatives may lead to an excess of labor in agriculture. "This, in turn, leads to reduced labor efficiency and to a misallocation of resources within the society" (20, p. 239). Suitable alternatives can be provided by the agricultural as well as the non-agricultural sector and, provided they are available, farmers can take advantage of them only if agricultural

\(^1\)Basic agricultural commodities mean those farm products which are considered by the government as essential for the diet of Costa Ricans as well as some raw materials. They essentially include beans, rice, corn, sorghum, cotton, etc.

\(^2\)The meaning of "just equilibrium" is not defined by the Law. Hopefully, the "just equilibrium" can be thought of as the equilibrium determined by supply and demand in a competitive market.
workers have both the required abilities for these opportunities and knowledge of these alternatives.

The Costa Rican farmer easily migrates either to rural or to urban areas. Their adaptation to different rural environments is good when he moves toward new regions attracted by the lure of fertile lands, better transport facilities and markets, etc. (42, p. 212).

This pattern of behavior of agricultural workers is an important feature in an economy like Costa Rica which has good settlement opportunities in areas which already have considerable investment in overhead capital.

Salazar (49) offers a very well-documented analysis about the historical types and patterns of settlement in Costa Rica. He identifies two major forms of settlement: orderly private and governmental settlement, and spontaneous settlement (non-organised). From his analysis it is evident that the latter type of settlement has predominated in the country. There have been orderly attempts of settlement - private and governmental - in Costa Rica but their magnitude relative to non-organised settlement has not been considerable, and most of them have been unsuccessful. "An exception worth mentioning is the...San Vito de Jaba [Settlement], established in 1951. This...[attempt] is considered the most important experiment to date; it clears the road, offering valuable lessons for similar projects in the future" (9, p. 14).

The consequence of non-organised settlement has caused irrational destruction of woodlands; increased latifundia; cultural, social and economic isolation of settlers; seminomadism; low agricultural productivity; lack of agricultural diversification; etc. (49).
The migratory flow from rural to urban areas seems also to be high. There is no data available for a quantitative evaluation of this process but, perhaps, the same different population growth rates in rural areas (3.4 annually) and in urban areas (4.3 annually) is a good indicator that this phenomenon is underway\(^1\). However, migration toward the cities seems to be the cause of what Navarrete terms "underemployment of expansion"\(^2\) (38, p. 343) and to which the National Planning Office refers to in the following terms.

The Labor force which quit working in agricultural activities in order to seek employment in the cities is apparently formed by people who were either unemployed or underemployed in the agricultural sector, and who, when reach the cities demand housing, public services and jobs. They are people without training for manufacturing activities...circumstances that make it difficult for them to find a...job; [hence] they have increased the non-agricultural disguised unemployment (42, p. 216).

Further the same institution adds, "They work mostly like peddlers and in the performing of services..." (42, p. 216).

The foregoing statement emphasizes a well known problem; that is, elementary education, to say nothing of technical education, in rural areas is much inferior to that in urban areas. For instance, in Costa Rica where the level of literacy is quite high relative to other less developed countries - nearly 82 per cent - the degree of illiteracy in

\(^1\)This different rate of population growth between urban and rural areas cannot be explained only by migration. Better health conditions in urban areas relative to rural areas can explain part of this gap in growth rates.

\(^2\)They define it as the kind of underemployment "due to the failure of capital and of most complementary means of production to increase at the same rate as the supply of labour in secondary and tertiary activities" (38, p. 343).
rural areas was 22.0 as compared to 6.1 in urban areas (55, p. 118). Schickale explains this discrepancy of the educational level between rural and urban areas by considering three aspects: 1) higher cost per pupil resulting from the much smaller density of population in rural areas as compared to urban areas, 2) a much more effective pressure for schools in the city, where people may be more conscious of the value of education and are closer to legislators and government leaders whose job it is to allocate funds, and 3) the silent opposition of the rural elite - the landlords, estate managers, merchants, and money-lenders who feel that ignorant farmers are easier to deal with and keep in their subservient place as laborers, tenants, or borrowers (55, pp. 117-118).

2. Within Costa Rican agriculture one of the major elements in the factor endowment is labor; hence, an effort directed toward increased efficiency of this resource will bring beneficial influence in economic development. Increased labor efficiency, mainly through the use of better technology is, perhaps, one of the most important steps toward economic development which the country may attempt.

Specific patterns of land distribution hamper the adoption and implementation of technological innovations and hence a more efficient resource use. Latifundia, minifundia and fragmentation of holdings into non-contiguous tracts are important factors causing this sort of inefficient resource allocation which, in turn, hinders the achievement of the proposed essential elements of economic development.

The Spanish colonization process had little influence in implanting the encomienda system in Costa Rica. "The encomienda was the apologetic origin of the enslavement of the native Indian population
under which much of the Spanish New World suffered — guised in the
term "Christianization" (27, p. 41). Costa Rica is one of the few
Latin American countries in which the Spanish governors had to work the
land with their own hands; hence, there were not great incentives to
create the extensive holdings which "lie at the roots of agrarian
problems in most Latin American countries today" (27, p. 41). Salazar
points out four reasons for the growing of larger-than-family-farms in
Costa Rica: (a) coffee exports to Europe in the second half of the
nineteen century stimulated the accumulation of land and combination
of small properties into large holdings since only "they could economi-
cally support the large beneficios" which prepared and shipped the raw
coffee for export. English coffee merchants who advanced money on
coffee future permitted their local representatives to start the process
of taking over small farmers who had failed to pay previous loans
advanced to them to build "beneficios" and to increase production. Thus,
stresses Facio, "It started to grow up the coffee hacienda, the lati-
funfia, and it seems alongside or rather under, the exporter and the
farmer, the "peon" who was once the small owner now dispossessed" (16,
p. 26); (b) land laws enacted in the last half of the nineteen century
which were designed to pay for public services and to cancel government
debts by the granting of public domain lands; (c) large areas of
public domain lands were acquired by a few individuals through the
already cited Precarious Occupants Law of 1962; (d) The banana con-
tracts. In 1962 the United Fruit Company owned 4 per cent of the
nation's total area, or, 7.5 per cent of the area of farms covered by
the Census, from which only 14 per cent was under cultivation in the
early 1960's. Most of this area was given away by the Costa Rican
government to this business enterprise at the beginning of this century.

The pattern of land distribution in Costa Rica for 1950, 1955, and
1963 is given in Table 7. A comparison of number of farms with regard
to total area indicates to us the country's unequal pattern of land
distribution, and, consequently, the existence of both latifundia and
minifundia. Thus, for instance, one thousandth per cent of the number
of farms accounts for more than 16 per cent of the area\footnote{This area refers to that covered by the agricultural census of 1950, 1955 and 1963.} in 1963. More-
ever, only 2.6 per cent of the farms represents more than half of the
area. On the other hand, 23.0 per cent of the smaller farms accounts
for less than 5 per cent of the total area. Farms in the 175-999.9
mansanas range increased their share of total area in 1963 as compared
to 1950 while the smallest farm size decreased in both per cent of area
and number of farms. A number of farms smaller than one mansana (1.72
acres) are not known since the agricultural census does not include as
a farm holding any farm less than one mansana.

Latifundia which is generally associated with lower uses of land
reduces the efficiency of agricultural work. When land is withheld
from intensive cultivation because of the pattern of ownership, many
cultivators are forced to farm land of lower productive potential.
Moreover, latifundia sometimes means that a relatively high proportion
of farm size is idle. The Costa Rican situation concerning the use of
land is given in Table 8. It is interesting to note that while
permanent pastures and woodlands increase their relative share as farm
Table 7. Per cent of total area and number of farms in Costa Rica in 1950, 1955 and 1963\(^a\)

<table>
<thead>
<tr>
<th>Farm size(^b)</th>
<th>1950</th>
<th>1955</th>
<th>1963</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Per cent of total area</td>
<td>Per cent of number of farms</td>
<td>Per cent of total area</td>
</tr>
<tr>
<td>Total</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
<tr>
<td>From 1 to 4.9</td>
<td>1.13</td>
<td>27.86</td>
<td>1.26</td>
</tr>
<tr>
<td>&quot; 5 to 9.9</td>
<td>1.80</td>
<td>16.18</td>
<td>1.89</td>
</tr>
<tr>
<td>&quot; 10 to 14.9</td>
<td>1.92</td>
<td>9.90</td>
<td>2.05</td>
</tr>
<tr>
<td>&quot; 15 to 19.9</td>
<td>1.48</td>
<td>5.36</td>
<td>1.55</td>
</tr>
<tr>
<td>&quot; 20 to 29.9</td>
<td>3.53</td>
<td>5.04</td>
<td>3.79</td>
</tr>
<tr>
<td>&quot; 30 to 49.9</td>
<td>7.29</td>
<td>11.65</td>
<td>7.92</td>
</tr>
<tr>
<td>&quot; 50 to 99.9</td>
<td>11.96</td>
<td>10.92</td>
<td>12.82</td>
</tr>
<tr>
<td>&quot; 100 to 194.9</td>
<td>9.06</td>
<td>4.40</td>
<td>10.35</td>
</tr>
<tr>
<td>&quot; 175 to 299.9</td>
<td>5.83</td>
<td>1.68</td>
<td>5.42</td>
</tr>
<tr>
<td>&quot; 250 to 499.9</td>
<td>8.47</td>
<td>1.98</td>
<td>10.45</td>
</tr>
<tr>
<td>&quot; 500 to 999.9</td>
<td>8.65</td>
<td>0.76</td>
<td>8.87</td>
</tr>
<tr>
<td>&quot;1000 to 1499.9</td>
<td>4.08</td>
<td>0.21</td>
<td>4.72</td>
</tr>
<tr>
<td>&quot;1500 to 2499.9</td>
<td>8.28</td>
<td>0.25</td>
<td>7.95</td>
</tr>
<tr>
<td>&quot;3500 or more</td>
<td>26.56</td>
<td>0.31</td>
<td>20.96</td>
</tr>
</tbody>
</table>

\(^a\) Data from (42).

\(^b\) Farm size is given in manzanas. 1 manzana = 0.69 hectare = 1.72 acres.
Table 8. Land use by size farm in Costa Rica in 1955 and 1963*

<table>
<thead>
<tr>
<th>Farm size</th>
<th>1955</th>
<th>1963</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Farm lands</td>
<td>Permanent crops</td>
</tr>
<tr>
<td>From 1 to 9.9</td>
<td>39.2</td>
<td>33.3</td>
</tr>
<tr>
<td>10 to 49.9</td>
<td>28.6</td>
<td>13.6</td>
</tr>
<tr>
<td>50 to 99.9</td>
<td>22.6</td>
<td>7.3</td>
</tr>
<tr>
<td>100 to 499.9</td>
<td>14.0</td>
<td>6.5</td>
</tr>
<tr>
<td>500 to 999.9</td>
<td>8.0</td>
<td>12.7</td>
</tr>
<tr>
<td>1000 or more</td>
<td>6.9</td>
<td>4.4</td>
</tr>
</tbody>
</table>

*Data from (42).
size increases farm lands and permanent crops follow the opposite pattern of growth; i.e., as the farm size increases the relative importance of these activities fall sharply. Permanent pastures are partially devoted to feed and raise livestock (Table 9). However, while the area under livestock doubles that of crops, its contribution to the agricultural GNP, as mentioned earlier, was five per cent in 1950 and nearly 10 per cent in 1969. The intensiveness with which this activity is carried out in different areas of the country is explained by the National Planning Office in these terms.

Concerning livestock exploitation, two well-defined and generalized processes of production associated with different zones can be identified: the semi-intensive predominating in the...Central Plateau and, the extensive of the coastal regions, valleys and mountainous zones of the rest of the country (42, p. 110).

The University of Costa Rica expresses a similar viewpoint in so far as the extensiveness of livestock activities (66, p. 18). The Land and Land Settlement Institute (hereafter called the Institute) comments that as a national average one head of cattle is held in two hectares of land. The variability of this average, however, is large. In some regions two heads are held in less than 1.5 hectares while in other regions one head of cattle uses more than 7 hectares (31, p. 36). Unfortunately, information on the suitability of these regions for cattle raising relative to crop activities is not available.

A breakdown of farm lands into three different concepts reveals to the reader the greater relative intensity with which the area is used by "small" farms as compared to "large" farms (Table 10). It can be easily observed that the proportion of idle land is directly

<table>
<thead>
<tr>
<th>Concept</th>
<th>1950</th>
<th>1955</th>
<th>1963</th>
</tr>
</thead>
<tbody>
<tr>
<td>Country's area</td>
<td>5101.1</td>
<td>5101.1</td>
<td>5101.1</td>
</tr>
<tr>
<td>Area under use</td>
<td>946.4</td>
<td>1131.4</td>
<td>1306.3</td>
</tr>
<tr>
<td>Crops</td>
<td>316.2</td>
<td>403.4</td>
<td>565.5</td>
</tr>
<tr>
<td>Livestock</td>
<td>630.2</td>
<td>730.0</td>
<td>1240.7</td>
</tr>
</tbody>
</table>

aData from (42, p. 225).

proportional to farm size. In other words, as the farm size increases the proportion of land under use decreases. "Others" is the concept that increased the most between 1955 and 1963 in any of the frequency distribution included. Land area under annual crops decreased in percentage terms, from 1 to 9 and 10 to 49.9 farm size, in 1963 as compared to 1955, while farms from 1000 manzanas or more increased their per cent from nearly 9 to about 16 per cent. Other farm sizes held their relative position of annual crops between these two years.

It is possible that some area under the idle land heading is for rotational purposes, although, with few exceptions, idle land is far beyond land requirements to achieve this purpose. Furthermore, land rotation and conservation practices are not widespread in the Costa Rican agriculture, a fact stressed by the Planning Office in the following terms:

Rotational and soil conservation systems are not generalized. It is a serious obstacle for a progressive and sustained development of this activity, because of soil erosion... (42, p. 110).
Table 10. Farm land use in Costa Rica in 1955 and 1963a

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>From 1 to 9.9</td>
<td>83.4</td>
<td>11.5</td>
<td>5.3</td>
<td>73.7</td>
<td>14.5</td>
<td>11.8</td>
</tr>
<tr>
<td>&quot; 10 to 49.9</td>
<td>94.8</td>
<td>36.4</td>
<td>8.8</td>
<td>49.1</td>
<td>36.1</td>
<td>14.8</td>
</tr>
<tr>
<td>&quot; 50 to 99.9</td>
<td>39.9</td>
<td>49.7</td>
<td>10.4</td>
<td>37.6</td>
<td>46.4</td>
<td>16.0</td>
</tr>
<tr>
<td>&quot; 100 to 499.9</td>
<td>29.6</td>
<td>60.3</td>
<td>9.9</td>
<td>28.3</td>
<td>51.8</td>
<td>19.9</td>
</tr>
<tr>
<td>&quot; 500 to 999.9</td>
<td>19.2</td>
<td>72.6</td>
<td>8.3</td>
<td>20.7</td>
<td>53.7</td>
<td>25.6</td>
</tr>
<tr>
<td>&quot; 1000 or more</td>
<td>8.7</td>
<td>77.4</td>
<td>13.9</td>
<td>15.8</td>
<td>51.9</td>
<td>32.3</td>
</tr>
</tbody>
</table>

aData from (42).

bIncludes pastures, orchards and other farm lands.
Fragmentation into noncontiguous tracts apparently is another defect in the land tenure setting of the country. The major effects of this kind of fragmentation are to reduce labor efficiency, to increase unnecessarily capital investment and to hinder the use of some types of machinery, above all when individual plots are "small".

The Agricultural Census of 1963 gives us information about parcelization by farm size in agriculture\(^1\). This defect is common to all farm sizes and is not related to particular land tenure structures. As illustrated in Table 11, farms ranging from one to four parcels represent more than 85 per cent of total number of farms in any of the frequency distribution considered. However, for the 1 to 4.9 manzanas farm size, farms of one and two plots account for more than 90 per cent of the total number of farms included in this size bracket.

3. Three classes of defects in land tenure institutions may be discerned which tend to hamper capital formation and capital use. The major structures associated with this defect are high fixed costs of ownership (amortization payments, interest rates on long term capital, and taxes), high costs in operating land (rents, factor and product markets\(^2\), and interest in operating capital), and lack of opportunity and information to channel savings into productive activities.

Efficiency in capital use can be improved through reducing the

---

\(^1\)These figures from the census have to be skeptically considered since the census defines a farm as having various parcels even if they are contiguous which is not the phenomenon we are interested in.

\(^2\)In this work this concept is referring to any factor but capital and land rents which are separately considered.
### Table II. Farm size and percentage of number of parcels in 1963^a^  

<table>
<thead>
<tr>
<th>Farm size</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9 or</th>
<th>10 or</th>
</tr>
</thead>
<tbody>
<tr>
<td>From 1 to</td>
<td>3.9</td>
<td>69.80</td>
<td>21.90</td>
<td>6.20</td>
<td>1.40</td>
<td>0.30</td>
<td>0.20</td>
<td>0.10</td>
<td>0.10</td>
<td>0.01</td>
</tr>
<tr>
<td>&quot; 4 to 9.9</td>
<td>60.90</td>
<td>23.80</td>
<td>9.30</td>
<td>3.50</td>
<td>1.50</td>
<td>0.5</td>
<td>0.20</td>
<td>0.01</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>&quot; 10 to 19.9</td>
<td>59.60</td>
<td>22.06</td>
<td>9.39</td>
<td>4.50</td>
<td>2.21</td>
<td>0.93</td>
<td>0.69</td>
<td>0.26</td>
<td>0.09</td>
<td>0.25</td>
</tr>
<tr>
<td>&quot; 20 to 49.9</td>
<td>65.38</td>
<td>18.41</td>
<td>8.04</td>
<td>3.59</td>
<td>1.95</td>
<td>0.95</td>
<td>0.88</td>
<td>0.39</td>
<td>0.27</td>
<td>0.43</td>
</tr>
<tr>
<td>&quot; 50 to 144.9</td>
<td>60.58</td>
<td>20.51</td>
<td>9.05</td>
<td>4.37</td>
<td>2.14</td>
<td>1.15</td>
<td>0.68</td>
<td>0.38</td>
<td>0.39</td>
<td>0.75</td>
</tr>
<tr>
<td>&quot; 145 to 499.9</td>
<td>50.69</td>
<td>20.40</td>
<td>11.68</td>
<td>6.14</td>
<td>3.52</td>
<td>2.19</td>
<td>1.34</td>
<td>0.93</td>
<td>0.93</td>
<td>2.18</td>
</tr>
<tr>
<td>&quot; 500 to 999.9</td>
<td>32.55</td>
<td>17.45</td>
<td>10.74</td>
<td>6.88</td>
<td>4.03</td>
<td>3.19</td>
<td>2.52</td>
<td>1.60</td>
<td>0.67</td>
<td>3.52</td>
</tr>
<tr>
<td>&quot; 1000 to 3499.9</td>
<td>55.00</td>
<td>14.72</td>
<td>8.89</td>
<td>6.39</td>
<td>3.06</td>
<td>2.22</td>
<td>2.22</td>
<td>0.83</td>
<td>0.84</td>
<td>5.56</td>
</tr>
</tbody>
</table>

^a^Data from (42; 43; 49).
costs of loaning money, above all, in such cases in which sectors are not integrated, thus causing a high differential rate among sectors. High interest rates on long-term capital tend to discourage capital investment and, consequently, to encourage crops planned over a shorter period of time than otherwise would prevail and of a labor-intensive nature.

Capital formation and capital use\(^1\) is widely recognised throughout the economic developmental literature as one of the most important aspects for less developed countries to overcome low levels of productivity which in general are widespread in these countries, above all, in agriculture.

Accumulation of physical capital for the agricultural sector in Costa Rica increased 70 per cent during 1950-1962. It includes plantations - coffee, banana, cocoa and sugar cane - buildings, installations and fences, livestock and agricultural machinery. The Planning Office reports the structure of physical capital did not experience significant changes in 1962 relative to 1950. Plantations accounted for about 46 per cent in 1962 and buildings installations and fences, livestock and agricultural machinery shared 34, 18 and 2 per cent, respectively. It is interesting to note that agricultural machinery tripled during 1950-1962; however, given its relative share of total physical capital is the lowest, it did not bring about significant changes in the physical capital structure (43, pp. 18-19). Quantitative measures of

---

\(^1\)In this work capital refers to all forms of productive resources that have a monetary (capitalized) value. It includes physical capital, social overhead capital, improvement and creation of institutions and expenses in education and research built by society and facilitating production.
agricultural capital for other concepts such as social overhead capital, education and research, etc. are unavailable.

More than 50 per cent of the loans granted by the Costa Rican banking system have been channeled into crop and livestock activities, at least, since 1950. This source of credit is believed to be the most important in the country. Since the country's banking system is State-owned, private loans for agricultural come mainly from importers of agricultural equipment, manufactures and dealers of fertilizers, insecticides and other agricultural factors, and by "beneficiadores" of coffee and sugar cane (42, p. 248). Unfortunately, there is neither information available about the magnitude of these operations nor the interest rates charged in them. Another source of credit whose importance is even more difficult to assess is moneylenders, middlemen and local merchants. This class of credit, which is common in some regions of the country, is provided by merchants to farmers who later on pay back with the product of their crops. It is even more frequent that the crops - partially or totally - pass from producer to merchant as a consequence of these kinds of transactions (42, p. 253).

Rates of interest for loans supplied by the banking system are in the 6 to 9 per cent a year range, depending upon the type of guarantee and length of the transaction: short, medium, and long term (42, p. 273).

The supply of credit provided by the banking system, however, is insufficient to satisfy farmers' demand for loans (42, pp. 215-239).

Misallocation of resources brought about by high taxes on agriculture and high amortization payments are of the same sort of those
arising from high interest rates on long-term capital. Again, information on these defects is meager. The Pan American Union reports taxation on property - urban and rural - yielded 6.1 and 9.1 per cent of the total tax revenue of Costa Rica in 1960 and 1961, respectively (48, p. 23). The real property tax was promulgated in Costa Rica since 1939 and it has been several times reformed, the last time in 1962. It yielded about 4.5 per cent of the country's tax revenue in 1960 and 1961. It is interesting to note that since the country was lacking a reliable method for recording land property, landowners not listed as such did not pay this tax at all. Similarly, property valuation and its control was almost nonexistent.

The country has not been heavily dependent upon land taxes in her total tax revenue. Land taxes in Costa Rica, which are assessed on a capital value basis, cannot be regarded as high relative to other less-developed countries (Table 12). While three countries were dependent upon land taxes for at least one-fifth of their total tax revenue in the fiscal year considered, Costa Rica was dependent upon one-twentieth of their total tax revenue.

Land values higher than those justified by land productivity will require relative high amortization payments, thus decreasing potential savings and discouraging capital investment. The occurrence of this defect would violate another essential element for economic development: distribution of income. McPherson gives us some interesting insights

1Wald defines "capital value" as "exchange or market value; that is, as the price at which properties are being sold or can be sold." (69, p. 23)
Table 12. Estimated yield of land taxes in selected countries expressed as percentage of total tax receipts

<table>
<thead>
<tr>
<th>Country</th>
<th>Type of land tax</th>
<th>Fiscal year</th>
<th>Percent of total</th>
</tr>
</thead>
<tbody>
<tr>
<td>China (Mainland)</td>
<td>Gross produce (in kind)</td>
<td>1953</td>
<td>24</td>
</tr>
<tr>
<td>Korea</td>
<td>Gross produce (in kind)</td>
<td>1954</td>
<td>24</td>
</tr>
<tr>
<td>Ethiopia</td>
<td>Area (classified rate)</td>
<td>1953</td>
<td>22</td>
</tr>
<tr>
<td>Panama</td>
<td>Capital value</td>
<td>1951</td>
<td>8</td>
</tr>
<tr>
<td>Costa Rica</td>
<td>Capital value</td>
<td>1950</td>
<td>5</td>
</tr>
<tr>
<td>Nicaragua</td>
<td>Capital value</td>
<td>1951</td>
<td>3</td>
</tr>
<tr>
<td>Guatemala</td>
<td>Capital value</td>
<td>1949</td>
<td>2</td>
</tr>
</tbody>
</table>

aData from (69, p. 62).

...in so far as land values in several countries. Thus, for example, he compares land values per acre of crop land and wage rates per eight hours paid to agricultural workers. While in North Carolina the value of crop land per acre for tobacco was U.S. $450 and the eight-hours-wage rate U.S. $4.75, in Costa Rica they were, for the same crop, U.S. $419 and U.S. $0.79 respectively (36, p. 104). Of course, even though these isolated and partial figures are not enough to draw a definite conclusion upon land values, they can be considered as an indicator of the high cost of this factor of production in Costa Rica.

High fixed costs of operation represented by unduly high rents, i.e., rents higher than the marginal value product they contribute, are another source of inefficient resource allocation. As commented by Gittinger, "Under such circumstances the tenant no longer has the
incentive to move toward the optimum enterprise combination for the
farm firm as a whole. This in turn will lead to reduced efficiency of
labor, and to an allocation of capital in a manner which does not
result in the greatest efficiency, considering the firm as a whole. It
may also result in a reduced rate of internal savings..." (20, p. 325).

In an earlier section of this Chapter the relative little relevance
rents have had so far in Costa Rica was quoted. While there is some
legislation - which is unavailable - regulating rental arrangements
between landlords and tenants in the country, it seems to be unduly
vague. About it the United Nations reports,

In Costa Rica no specific legislation has been enacted to
prevent exorbitant rents. However, the Agricultural Pro-
duction Act of 1944 declares that it will be regarded as
contrary to the public interest to allow land to lie idle
or to charge a high rent for its cultivation as long as the
production of staple foodstuffs, specified by the Act, remains
insufficient to satisfy local demand. It is also stipulated
that rent may be paid by tenants either in kind or in cash
at the market price of the produce, in accordance with regula-
tions issued by the Ministry of Agriculture in each zone.
The Act, however, has not been implemented" (65, p. 47).

Defective factors and product markets discourage the use and
formation of capital. When factor prices are supplied to cultivators
at prices beyond their marginal value product, they will not be able to
use the optimum input-mix and thus the attainment of the most efficient
production level will be impossible. The low income level coming out
of this pattern of production will reduce investment potentialities and
use of capital. Structural defects in product marketing bring about
similar consequences to those defects in factor markets. However, the
former defects make it impossible to reward owner's factors in accord
with their marginal productivity.
Several Costa Rican institutions in charge of price stabilization programs also perform marketing activities by buying commodities directly from cultivators and by supplying some factors of production to farmers such as improved seeds, agricultural machinery, etc. However, since product marketing activities are restricted to a few commodities and the provision of factors is also limited, the same government recognizes, "A high percentage of the agricultural production value at market prices is absorbed in the marketing process" (43, p. 22).

In less developed countries’ agriculture, the existence of money-lenders, middlemen and local merchants is oftentimes associated with these kind of transactions in which excessive high charges are assessed by the concept of marketing and processing commodities, loaning, provision of factors of production, etc. (64; 63; 20; 18). Their presence within the agrarian sector of Costa Rica has been already pointed out.

Lack of opportunities and knowledge on alternative productive investments hamper the channeling of actual savings. This phenomenon is an aspect of a more general problem which is widespread in underdeveloped countries, namely, dissemination of information. In fact, overcoming defects in land tenure structures demands greater amounts of and more widespread information. Without information about physical possibilities and institutional arrangements it is difficult for the cultivator to acquire and use the optimum input-mix which will allow him to increase per capita productivity. When cultivators are bound by
traditional agriculture in a Schultsian\(^1\) sense, investment is discouraged and hence it may cause hoarding, conspicuous consumption, money sent out of the country as "flight capital," etc. A Mission of the International Bank comments on the occurrence of this phenomenon in Costa Rica in the following terms,

Most people in Costa Rica, use their savings to build houses, to purchase automobiles and other consumer's durable goods, to buy land, to buy urban commercial property, to build up bank balances in the United States, or to hoard Costa Rican or United States currency (32, p. 71).

While the statement refers to the economic system as a whole, it is possible that part of these funds have been siphoned out from agriculture to "invest" in such unproductive activities. Logically, it would reduce capital formation possibilities within agriculture.

Within the agricultural sector of Costa Rica there are several specialized governmental agencies performing activities of research, technical assistance, agricultural extension and education. The National Planning Office, however, emphasizes that,

Agricultural education has been small and only carried out at a professional level. There is an urgent need for dissemination of knowledge at all levels, specifically at farmers' level... In addition the number of professionals in this field is small...and there is a lack not only of agronomists at a higher educational level but also of specialists in different fields. On the other hand, there is a great deficiency in disseminating knowledge among farmers. In some instances discoveries and knowledge are kept in research and educational institutions without being used by farmers. Moreover, agricultural education at

\(^1\)He defines "traditional agriculture" as the stage," in which the state of the arts and the state of preference and motives for holding and acquiring agricultural factors as sources of income streams have remained approximately constant for a long period - long enough for suppliers and demanders of agricultural factors to have arrived years ago at a particular long-run equilibrium" (59, p. 107).
intermediate and low levels is lacking. At the present, agricultural education exists almost only at the professional level;...as a result technical dissemination, at all levels, has not received importance" (49, pp. 17-18).

C. The Population Problem

Throughout this work it has been emphasized that economic development, and, hence, agrarian reform cannot be studied from a "pure" economic viewpoint. Political and social aspects are closely tied to economic factors and, therefore, they should not be overlooked. In this study some of these aspects have already been briefly considered and others will be commented later on when it be necessary. However, an exception is made with regard to the population problem. No doubt, it has been one of the most striking problems facing the Costa Rican economy in the last years. The high annual rate of population growth of the country - 3.8 - is one of the highest, if not the highest, of the world. This rate of population growth means that population doubles itself every 18 years.1 By using Thompson's2 classification

\[ 1 \text{Let } 2A (1+r)^n = B \quad (I) \]

where A population in year 0; B population in year X; r = annual rate of population growth; and n = number of years. Let B = 2A, therefore, 2 = B/A. Then equation (I) becomes

\[ (1+r)^n = \frac{B}{A} = 2 \quad (II) \]

In logarithmic terms (II) is expressed as

\[ n \log (1+r) = \log 2 \quad (III) \]

From (III) solving for n we have

\[ n = \frac{\log 2}{\log (1.038)} \quad (IV) \]

From (IV) we obtain n = 18.1

2For the sake of simplicity in analyzing population problems Thompson (57) suggests nations can be classified into three groups on the basis of the population growth potentials within the country. His scheme can be summarized as follows:

<table>
<thead>
<tr>
<th>Type of country</th>
<th>Death rate</th>
<th>Birth rate</th>
<th>Population growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class I</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>Class II</td>
<td>Medium</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Class III</td>
<td>High</td>
<td>High</td>
<td>Low</td>
</tr>
</tbody>
</table>
of countries according to their population growth potentialities Costa Rica would have to be included as a Class II type-of-country.

Although the country is now almost 500 years old, population growth was relatively slow until the second half of the last century (Table 13). In the last generation the country experienced the sharpest rates of population increase, brought about by the introduction of public health measures, control of communicable diseases, and the resulting drastic reductions in death rates, both in general and infant mortality (27, pp. 42-43). At the same time, this has been accompanied of an increase in the birth rate that passed from less than 45 per thousand inhabitants in the period 1930 to 1950 and since that time it has risen to nearly 49. "The rise in the birth rate is another reflection of the results that have accrued from public health. Malaria, which was one of the principal causes of death in the earlier period cited, has been almost eliminated, and it is well known that malaria is a cause of sterility" (27, p. 43).

The relationship between rate of fertility, mortality and population growth is given in Table 14. While the crude rate of births in Costa Rica was as high as 47.5 per thousand in 1960, the rate of mortality was low for a less developed country like Costa Rica.

Although the general mortality rate was reported as being 18 per thousand inhabitants in 1940, and only 8.6 in 1960, the National Planning Office estimates that in the mortality rate of 1960 there is an omission ranging from 10 to 20 per cent (42, p. 239).

The population problem of Costa Rica is a clear example of something that generally is overlooked in the economic analysis: technological
Table 13. Population of Costa Rica 1822-1963

<table>
<thead>
<tr>
<th>Year</th>
<th>Inhabitants</th>
<th>Rate of growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>1864</td>
<td>120,000</td>
<td>3.5</td>
</tr>
<tr>
<td>1892</td>
<td>243,000</td>
<td>2.7</td>
</tr>
<tr>
<td>1927</td>
<td>472,000</td>
<td>3.1</td>
</tr>
<tr>
<td>1950</td>
<td>801,000</td>
<td>3.8</td>
</tr>
<tr>
<td>1963</td>
<td>1,325,000</td>
<td></td>
</tr>
</tbody>
</table>

aData from (43).

Innovations are commonly assumed to increase supply of consumption goods either exclusively or faster than demand. However, innovations can be of a demand and/or supply increase nature. Thus, for example, the health measures successfully introduced in the country imply that an increasing number of people ought to be fed, or, in other words, that there is an increasing demand for food. However, the health improvements do not guarantee us that the per capita productivity level will be increased. On the contrary, as will be commented on in forthcoming pages, the impact of a high rate of population growth reduces the possibilities for society to increase capital formation. In fact, the problem in Costa Rica is even more serious since the high population growth has been accompanied by an increase in per capita income. These two factors, perhaps, may partially explain the diminishing trend in caloric food intake experienced in Costa Rica during 1950-1962.
Table 14. Mortality rates and birth rates in the United States, Sweden, Costa Rica and Guatemala in 1960

<table>
<thead>
<tr>
<th>Country</th>
<th>Birth rate</th>
<th>Mortality rate</th>
<th>Rate of population growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States</td>
<td>23.7</td>
<td>9.5</td>
<td>1.42</td>
</tr>
<tr>
<td>Sweden</td>
<td>13.7</td>
<td>11.5</td>
<td>0.22</td>
</tr>
<tr>
<td>Costa Rica</td>
<td>47.5</td>
<td>8.6</td>
<td>3.29</td>
</tr>
<tr>
<td>Guatemala</td>
<td>49.5</td>
<td>17.5</td>
<td>3.20</td>
</tr>
</tbody>
</table>

aData from (42, p. 206).

regardless of the high increase in agricultural output.

Technological innovations tell us if they are capital-saving, labor-saving or neutral but nothing about how they affect supply and demand.

High birth rates and low mortality rates bring about a high proportion of children and a small proportion, in consequence, of adults in the most productive age (Table 15). Almost 50 per cent of the total population of the country was under age 15 in 1963, "in contrast with, a maximum of 25 to 30 per cent in the highly industrialized countries" (11, p. 46).

This concentration of population in the lower age brackets has adverse consequences for the economic development of the country. A high rate of population growth means that there is a high burden of dependency. This, in turn, implies that the capacity of the economy to

\[1\] However, a substantial portion of this increase was in agricultural commodities for export e.g. coffee.
divert effort and resources from producing for current consumption to producing for the enhancement of future productivity is sharply curtailed. Or, as commented by Chlin,

The simple and incontestable case against rapid population growth in poor countries is that it absorbs very large amounts of resources which may otherwise be used both for increased consumption and above all, for development (46, p. 53).

In fact, if the rate of population growth is high there will be a pressure toward using an increasing proportion of the country's GNP for consumption, thus reducing savings and hence, potential investments. This, in turn, might hamper the achievement of higher levels of per capita GNP in the future. Furthermore, after the short-run a new element, the different growth of the labor force itself, assumes important dimensions. The significance of the growth of the labor force for income per head is that higher rates of growth imply a higher level of needed investment to achieve a given per capita output, although there is nothing about faster growth that generates a greater supply of investible resources. A larger labor force requires a larger stock of productive facilities in order to have the same per capita productivity. "The percent of national income that must be invested merely to keep
productivity from declining is some three times the annual per cent rate of increase of the labor force\(^1\) (11, p. 56).

Population growth can be decreased by both increasing the rate of mortality or by declining the rate of births. For obvious reasons, the first of these variables cannot be manipulated in a declining direction; hence the only possibility left for population control is the rate of births.

In the last years contraceptive methods have been developed which enable society to plan a birth-reduction with good possibilities of success. Obviously the implementation of such a plan will call for funds which otherwise would have been invested, for example, in development projects. Then, the question of where is investment more profitable in terms of per capita terms, arises. In birth control or in a series of development projects? Stephen Enke gives an answer to this question through the use of an illustrative arithmetic procedure (15). It will be applied to Costa Rica to see how a birth control program can affect income per capita as compared to other forms of investment.

An increase in per capita income implies an increase in the GNP/population rates. To accomplish this, resources can be channeled to accelerate growth in output or to slow growth in population. Costa Rica had an annual per capita income of nearly U.S. $360 in 1963 while population was around 1.3 million in the same year which give a total GNP of about U.S. $470 millions. Let's assume the government decides

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\(^1\) This relationship assumes a product/capital ratio of nearly 0.33. The estimated product/capital coefficient for Costa Rica was about 0.4 in 1962, which according to Coale's reasoning will imply that the necessary investment so as to keep the productivity level constant would be about 2.5 times that of increase in the labor force.
to invest U.S. $0.1 million each year for ten years in developmental projects which increase output 40 per cent a year on an average. At the end of ten years the increase in output attributable to the total investment of U.S. $1.0 million will be U.S. $0.4 million (0.04x10=0.4), or, in other words, less than one thousandth of the country's GNP in 1962. Now let's assume the U.S. $0.1 million worth of resources is invested in a birth reduction program. If we assume that the cost per participant each year will be U.S. $5,00 there will be then 20,000 participants each year. After ten years there would have been about 0.2 million fewer births than would have otherwise occurred. This is a reduction, relative to population, of more than 15 per cent.

"There can be no question about which is the more effective use of the" U.S. $1.0 million - a 15 per cent reduction in births is nearly 150 times greater change than a 0.1 per cent increase in output. Enke concludes by stressing, "The moral is clear: if the objective is higher income per head, money spent to reduce births will be as much as... 150 times more effective than money invested to raise output. Such an enormous ratio of superiority is seldom encountered when comparing economic policies" (15, pp. 31-41).

This procedure although somewhat "mechanic" and perhaps including implicit assumptions such as complete success of the birth-reduction program, constancy of the product/capital ratio, etc., points out an

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1The product/capital coefficient (p/k) was 0.4 for the nation's economy in 1962. Therefore, p/k=0.4. Then if k=0.1, it implies P=0.04.

2Enke estimates the cost per participant in a similar birth reduction program in one dollar by using "inexpensive methods as the coil and the pill" (15, p. 31).
aspect that very seldom, if ever, is considered in earnest in develop-
ment plans. "If we value life and health, education, and relief from
poverty, the need for an early reduction of the birth rate is acute"
(30, p. 130).

D. Main Objectives and Provisions of the Law

After several unsuccessful and scattered attempts to find a
solution for the agrarian problems of the country, the Land and Land
Settlement Law was promulgated in October 1961. The major objectives
stated by the Law (30, p. 3) are:

1. To determine that land ownership must be promoted as a means
to obtain a gradual increase of its productivity and for a just distribu-
tion of its product, while improving the social status of the farmer
and making him a conscious participant of the social and economic
development of the country.

2. To contribute to the enhancement of the virtues of democracy,
private and public, linking citizens to a healthy pattern of land
possession.

3. To contribute to a more just wealth distribution.

4. To contribute to the conservation and careful use of the
reserves of renewable natural resources of the country.
5. To avoid land concentration in the hands of those who use it either for speculation or for exploitation in a manner detrimental to national interests. Land held for either of these purposes must return to the government in the manner determined by the Constitution and the Law.

6. To determine that land will not be used for farm workers' exploitation. The government, using all means at her disposition, will stimulate creation of agricultural cooperatives, thereby combining the dignity of private ownership with the efficiency of large enterprise.

7. To recognize in accordance with the foregoing objectives, the existence and legitimacy of private enterprise.

Further the Law states, "Any landless individual or group of persons forming a cooperative having the necessary abilities for crop and/or livestock activities has the right to own economically exploitable holdings, mainly in those regions in which they work, live, or, in zones previously selected." The Law also stipulates, "For those who work the land it must be the guarantee of their economic welfare, freedom and

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1 The Land and Land Settlement Institute considers that including a farm as a latifundia implies interrelationship between factors such as: (a) Large concentration of land in the hands of one person, (b) lower uses of land and idle land, (c) disadjustment among land, capital, and labor and techniques used, (d) existence of servido relationship between landowners and agricultural workers, (e) occupational immobility, and (f) low level of reinvestment. Further, this agency states that holdings exceeding 500 manzanas (720 hectares) might be considered as latifundia. "However, given the emphasis many economists have placed in holdings of or larger than 1000 manzanas (1440 hectares) the analysis of latifundia will be carried out on the basis of the latter classification" (31, pp. 21-24). It must be kept in mind, however, that under any of the two classifications a holding will be regarded as latifundia only if they bear the characteristics attached to this type of tenancy. Otherwise, we will be facing typical cases of efficient agricultural enterprises (31, p. 24).
dignity and, therefore, the basis for welfare, freedom and dignity of the Nation."

The Law has many provisions to pursue its objectives. However, the major provisions of the Law can be summarized in the following manner:

1. The Law enables the Institute to expropriate both areas of land exceeding the limit fixed for latifundia - which will be distributed to landless farmers or those who own land in insufficient amount - and small holdings, minifundia\(^1\), whose operation is deemed as uneconomically profitable. Land distribution to farmers will be made through the selling of private expropriated land and/or public domain lands. Agricultural workers will be able to pay for it in twenty-five annual installments, the first one falling due five years after possession. Land expropriation is also considered by the Law in cases in which it can prevent "irrational fragmentation".

2. The Law sets rules for the compensation of expropriated private lands. It can be made through cash payments or bonds, the decision upon the method of payment being made by the Institute. Anyhow, it will

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\(^1\) The Institute defines minifundia as: (a) small holdings which are insufficient to provide the necessary income for families to achieve an adequate level of life; (b) as a consequence of (a) both the level of income is low, which means insufficiency to fulfill basic family needs, and because of farm size the adoption of more appropriate techniques is hampered when soils are not fertile or when they have been exhausted because of lack of conservation practices; (c) when family members have to work outside of their small holdings to increase the level of income; and (d) when labor demand falls short of total labor supply, the members of these family units become part of agrarian unemployment (31, pp. 21-24). "To facilitate the identification of minifundia in Costa Rica" continues the Institute "it will be considered it can be more frequently found in holdings smaller than 10 manzanas (14.4 hectares). Undoubtedly, this estimation must vary in each region according to ecological and pedological conditions, type of crop, techniques used, etc. Similar considerations have to be made for latifundia" (31, p. 24).
be based on the declared tax value of the property.

3. Idle land areas greater than 100 hectares within a particular holding are discouraged through the assessment of an additional progressive tax. Idle land in excess of 100 hectares is taxed on a sliding scale from 0.25 per cent to 2.5 per cent of the property value per year, depending on the size.

4. One of the major provisions of the Law is aimed to give legal status to precarious occupants (squatters) and to try to halt the practice of invasion of the land. This latter goal will be partially pursued by making as non-eligible for services under the Institute's program, those who have invaded land after the promulgation of the Law. Instead landless farmers willing to work on agricultural activities will be provided with holdings through legal and organized means.

5. The Law emphasizes the need for both the establishment and enhancement of cooperatives. To this end, the banking system of the country will loan cooperatives at a rate of interest of 4 per cent annually, a lower rate of interest than for particular holders (6 per cent).

6. The Law calls for construction of access roads, irrigation projects, health and sanitation facilities, rural housing projects, schools, and other public services.
V. ANALYSIS OF THE LAW AS A MEANS TO ACHIEVE
THE DEVELOPMENTAL GOALS

After the goals pursued in this study are identified and the pre-
Law situation stated, the next step is to determine both the problematic
gap between goals and the situation before the promulgation of the Law
and the ability of it to fulfill this discrepancy. This last step is
pursued in terms of the identification of the success and failure
elements of the Law and/or other governmental programs. This part of
the analysis will be carried out following the same order of that in
previous sections.

1. Defects in land tenure institutions adversely affect the
necessary incentives for cultivator to increase his productivity.
Before starting the analysis a digression is necessary. In foregoing
chapters it was mentioned that defective land tenure structures hinder
the attainment for the farm firm for the optimum resource combination,
or, in other words, conditions of economic efficiency. Under condi-
tions of certainty and unlimited resources this condition, as stated
by Professor Mead (22, p. 197), is met when:

\[
\frac{P_y}{M_P} = \frac{P_y}{M_L} = \frac{P_y}{M_N} = 1.0
\]  

(1)

where \( P_y \) is the product price; \( M_P \) refers to the marginal physical
product and \( P \) refers to the price of the factor indicated by the
attached subscript. In other words, equation (1) states that with
profits maximized, one dollar invested in, let's say, factor \( C \), will
return as much as one dollar invested in any of the other two factors.
If one (or more) factor(s) is (are) limited, maximum profit is reached
when,

\[ \frac{\text{Py}_N}{\text{Py}_F} = \frac{\text{Py}_N}{\text{Py}_L} = \frac{\text{Py}_N}{\text{Py}_R} = \lambda \]  

(II)

where \( \lambda \) is any positive number (\( \lambda > 1.0 \)). Perfect knowledge of the future is seldom, if ever, met in agriculture since agricultural activities involve time and, hence, decision making must be made under uncertainty and risk conditions. "Risk refers to the variability of outcomes which are measurable in an empirical or quantitative manner," or, stated differently, "the parameters of the probability distribution (frequency distribution of outcomes) can be established for outcomes that involves risk" (22, pp. 440-441). In contrast to pure risk, "the probability of an outcome cannot be established in an empirical or quantitative sense for uncertainty" (22, p. 441). Assuming that the objective function of farmers under uncertainty is profit maximization, its attainment will rely to a great extent upon expectations of producers and their ability to make the "correct" decisions about production. In general, precautions taken by producers to meet uncertainty result in a less-than-maximum product from given resources (22, p. 530). Therefore, any deviation from conditions stated in equation (I) or (II) represents a less-than-most-efficient allocation of resources. From the viewpoint of an economic analysis of the conditions of tenancy, two conditions are the most relevant. They are (a) the marginal rate of substitution between two products must equal their price ratio, and (b) the marginal rate of substitution between any two factors must equal their price ratio.

Therefore, a movement toward the fulfillment of these conditions
will be in line with the attainment of the necessary conditions for agricultural development. Handburt (29) has identified four conditions within which lease arrangements provide the necessary elements to operate "at the maximum profit from the combined resources of landlord and tenant." These conditions are:

a. The share of the factor of variable input must be the same as the share of output of production obtained from it. This condition is totally fulfilled by a cash lease agreement since the tenant furnishes all the variable inputs and receives the returns from them. In share leasing agreements the fulfillment of this requisite implies that the share of variable cost must be the same as the share of returns, namely, that all variable costs must be shared.

b. "Equal shares for all products." Cash leases automatically fulfill this incentive condition since "the cash rental is a fixed cost for all products" and may be considered as charged in proportion to its return. Insofar as share rental, if different shares are assessed on different crops, the tenant has an incentive to produce that crop from which he receives the highest share and not to produce the quantities of the two products that result in the highest profit for the combined resources of the landlord and tenant. The allocation of resources then will be inefficient.

c. Each resource owner must receive the marginal value product of the resources he contributes. This condition applies both to variable and fixed resources of tenant and landowner.

If the resource owner does not have an opportunity to receive the full share of return from the resource contributed, he has incentive to move away from the highest
profit combination. If, through joint decisions, the firm is operated at the highest profit combination and one or the other receives less than his full share of the product earned, there is an income transfer.

This situation, if not, would violate one of the essential elements for agricultural development, namely, marginal value product rewards; although from an economic efficiency standpoint, it is acceptable.

d. "Each resource owner must have the opportunity to receive return on investment made in one production period but not forthcoming until a subsequent period." The fulfillment of this condition may imply compensation in two directions. First, compensation from landlord to tenant for unexhausted improvements. Second, compensation to the landlord in case of dilapidation.

Complete satisfaction of the foregoing conditions means that the marginal value product of each resource can be successfully identified. This task in the "real world", however, has not been satisfactorily accomplished. Of course, it does not mean that these sets of conditions are unimportant. They can be approximated through institutional adjustments. If the approximation is good, "the only advantage of ownership over tenancy may be noneconomic" (29, p. 268).

Uncertainty arising from conditions of tenure and unfavorable affecting incentives for the cultivator to improve his productivity can be considered as falling in any of the following categories: (a) uncertainty regarding his future control over the land resources, (b) certainty that he will not be rewarded proportionately to the effort he expends in resource use and/or the factor contribution he makes, and (c) a combination of (a) and (b).
Uncertainty associated with (a) shortens the planning horizon of producer from the optimum planning period. Consequently, "he is motivated to use his labor and capital for short-run efforts or for consumption purposes, and thus productivity is reduced" (39, p. 91). In this manner two of the essential elements for agricultural development and, therefore, for economic development are violated. Causes of this type of uncertainty are lack of secure title to land, short-term leases without assurance of renewal and possible loss of ownership because of high fixed mortgage commitments and price and yield uncertainties.

Professor Tiemann illustrates the effect of uncertainty arising out of conditions of tenure through Figure 3. On the vertical axis is plotted the capitalized total return expected by a farmer from a given investment in a particular activity. On the horizontal axis is plotted the time. In this diagram A represents the capitalized total return the farmer expects from a short-run crop during period of time $t_1$. An alternative crop practice taking a longer period of time, let's say $t_2$, but providing a higher yield B, is also available. If the farmer is not assured he can stay on his farm longer than one year, he, obviously, will not undertake the longer-term project. This, of course, will reduce the farmer's income to A. Consequently, capital investments such as use of fertilizers, lime, etc., are discouraged. The longer-term project will only be undertaken if the farmer's planning horizon is extended to $t_2$. "It is obvious, however, that beyond a certain length of time the individual cultivator's plans are unaffected by assurance

1 Planning horizon is the length of time during which total returns expected by the cultivator from one project are realized.
Figure 3. Expected planning horizon
of secure tenancy for a longer period in the future" (69, p. 12). This would be the case if tenancy is extended to $t_2$. Therefore, $t_2$ "becomes the norm to which it is theoretically desirable to extend the individual cultivator's planning horizon, and the norm for extending the length of the tenancy contract" (69, p. 12). This kind of structural defect, in turn, hinders the farmer's possibilities of being eligible for long-term loans since sources of credit will be unwilling to loan farmers with short-term leases.

As commented in Chapter IV, tenancy has not been an important feature of the land tenure setting of Costa Rica. In fact, "Costa Ricans have always prided themselves of being a country of small property owners" (27, p. 44). In this vein, Rejas and Escoto stressed,

Costa Rica is not faced with the social serious problems that occur when farmers do not own the land they work (27, p. 43).

This foregoing statement, although only partially true, depicts an erroneous point of view on this aspect of agrarian reform which seems to have influenced the Law. In fact, it emphasizes the advantages of ownership relative to tenancy throughout. Thus, for instance, the Law stresses,

The Institute will study the possibility to substitute, in accordance to the principles and norms of this Law... the indirect forms of land exploitation for ownership (30, p. 4). The Law seems to express the tenant that land ownership is good [not good], i.e., ownership as an end in itself. While from a subjective viewpoint landownership might be regarded as an end in itself, from an economic viewpoint of production it has to be considered as any other factor of production. It is obvious that in some instances, "The owner-operator
often realizes greater returns than a tenant from a given collection of resources because of the distortion which the lease causes in production possibilities at a given time and over time" (23, p. 46). However, this situation is brought about by defects in tenancy conditions and not because tenancy, by and of itself, hampers the achievement of economic efficiency as was shown through the Burdurt's four conditions. Land ownership is, no doubt, the best alternative measure to remedy uncertainty arising from conditions of tenure. This means ownership lengthens the economic horizon by improving certainty expectations. In addition, ownership provides a means through which eligibility for credit is achieved when property is needed as collateral. Specific institutional adjustments in tenancy patterns directed to reduce uncertainty are widely discussed by the United Nations (63) and they are in connection with written lease provisions, a minimum lease term, a minimum termination notice and automatical renewal, restrictions on transfer of leased land, heritability of leases, permanent occupancy and use of rights, and compensation for disturbance. Success or failure of these measures to lengthen the farmer's planning horizon depend upon the strict implementation and control of these adjustments.

That tenancy, under certain conditions, is an alternative to ownership is substantiated not only in theory but also on empirical grounds. In a study conducted by Sanderson (50), of the efficiency under different tenancy arrangements relative to ownership in the Midwest of the United States, he reached this conclusion.

Tests of differences between the production functions revealed that there are not significant differences in production elasticities of crop resources between the tenure classes
Miller (37) comes to a similar conclusion in a study of the relationships between the tenure status of farm operators and the productivities of resources employed on a sampling of farms in Iowa and Illinois. On this matter Turn also observes,

Case studies in the United States show no significant differences in efficiency between tenant farming and owner farming...(62, p. 269).

Tenancy, as stated earlier, can be important in Costa Rica for several reasons: (a) at the present, some farms are operated under tenancy, (b) the country’s land reserves will be exhausted sooner or later, and (c) through tenancy the availability of farmer’s operating capital can be increased under certain conditions. The Law makes provisions to deal with leasing arrangements for those cases in which the Institute rents land to agricultural workers. Thus, for instance, settlement projects can be established by providing ownership to cultivators, in “aparecias,” or in long-term or during life usufruct at fixed price proportional to the product of the farm. The last two conditions of tenancy fail to fulfill the Burlburt’s conditions and hence they do not provide a good approximation to conditions of ownership. Similar arrangements between private owners and tenants are not regulated by the Law and it is assumed they are under the Land and Share-cropping Law of 1942 which is not available for examination.

1These conditions basically refer to the case when the purchasing of land is made through cash payments or when its purchase required high down payments and/or large annual installments.

2“aparecia” is a system of land tenure whereby the cultivator is required to deliver a predetermined percentage of the crop in exchange for the usufruct of his plot of land.
Secure title to land is of relevance to the landholder since, in this manner, certainty of expectations is increased by eliminating uncertainty arising from ownership. This structural defect has similar consequences in so far as resource allocation to that of uncertainties arising from conditions of tenure. However, when this defect is present, the farmer's situation concerning credit is worse than in the case of insecurity of tenancy. Defective title to land reduces the availability of both long-term and short-term credit while insecurity of tenancy in general reduces only the long-term supply of credit for farm operators. Under these circumstances, the cultivator fails to use the optimum amount of capital which would be indicated if credit were available.

This defect was widespread in Costa Rica previously to 1961. The Law, however, put great emphasis in overcoming this structural defect. One of the first measures to achieve this objective has been to undertake the elaboration of a cadastral survey, a program that is included in the Plan of the country as a target variable for the agricultural sectors (43, p. 65). This step is essential for an orderly programing of agrarian reform activities. Binsm makes an extensive analysis of the advantages of a cadastral survey in agrarian reform process (5).

Another measure directed to subdue this problem is pursued through making available credit only to landowners who have recorded title on their holdings. Similarly, the Law put emphasis in legalizing the squatter's condition. "This is at the heart of the program to give the parasite [squatter] legal status" (27, p. 46). The elimination of this defect in a period of four years is set as a target in the Plan (43, p. 86).
Yield and price uncertainties and high fixed mortgage commitments are possible causes of loss of ownership. This kind of uncertainty exerts similar, unfavorable effects on resource allocation as defective title to land and uncertainties arising from conditions of tenure do.

One of the major functions of market prices is to guide resources into those lines of production which conform to the choices of consumers. However, as Professor Heady asserts,

The great variability of farm commodity prices and the lack of any simple and effective system which farmers can use in forming price expectations causes market prices to serve inefficiently in this respect (22, p. 497).

While forward price schemes may ameliorate uncertainties arising from possible loss of ownership due to price and yield uncertainties, it also can bring about misallocation of resources.

Only if national administrators do form more accurate expectations of future quantities (structural changes in demand and supply) than farmers, efficiency in resource use can be increased (22, p. 532).

In Chapter IV it was quoted that there are several governmental agencies in Costa Rica devoted to price stabilization of different agricultural commodities. This scheme has been both incomplete in the sense that it only covers a few commodities and to a great extent inefficient. Stacy Nay, when referring to this problem, says,

There are dangers inherent in price support programs. One of the most serious is that the level of announced prices becomes a political matter. In such cases pressure is asserted on the government for high prices and it is difficult, if not impossible, to lower prices of individual products...Certainly the price support program in Costa Rica has contributed to high prices (35, p. 57).

A similar opinion on this matter is expressed by the National Planning
Office (49, p. 75). The plan includes as a variable target the re-
evaluation of the price support policies in order to make them adequate
in accordance with the Central American Common Market objectives (49,
pp. 75-76). The government, through the Consejo, is obliged to assist
the Institute in the elaboration of price support programs, policies,

etc.

Measures to subdue uncertainties arising from high mortgage commit-
ments are specified by the Law pursuing to ameliorate the existence of
precarious occupants only for holdings sold by the Institute to culti-
vators, and for transactions carried out between landlords and squatters.

As commented in a foregoing section, migrational patterns in Costa
Rica either to cities or to different rural areas have been the cause
of social and economic problems. While cultivators were not frozen to
specific areas or jobs, their lack of knowledge about alternative
opportunities and/or their lack of ability to fulfill the requirements
for specific jobs must be regarded as a cause of this outcome. Never-
theless, under certain conditions shifting agricultural labor force
either out of this industry or to other agricultural regions may increase
the marginal value product of both the labor which moves and the labor
which remains in agriculture.

Costa Rica has good opportunities for agricultural settlement.
Idle land, public domain lands, and lesser use of land due to the pattern
of ownership (e.g., permanent pastures) are sources of land to achieve
this purpose. The Law, as suggested by its name, put great emphasis on

1The banking system apparently makes transactions pursuing similar
objectives. Unfortunately, information about the procedures and con-
ditions under which they are made is unavailable.
this aspect of agrarian reform. Moreover, one of the targets of the plan is the programming and implementation of organised agricultural settlement projects (M, p. 69).

Shifting farmers to different rural areas provides gains in addition to those considered above. First, since the average educational level is lower in rural areas than in urban areas, a shift of rural people to cities will place them in a disadvantage relative to city workers. In other words, farmers might have greater comparative advantage in agricultural activities. Second, the extremely high population growth and moderate income per capita increase are and will exert an ever increasing pressure on the supply of foodstuffs. If agricultural output is not substantially increased in a relatively short period of time, the result will be higher prices and lower calorie food intake levels. While settlement by itself might increase per capita productivity in agriculture, given the same level of technology is held, it must not be a substitute for the achievement of higher levels of productivity arising from the adoption of more efficient techniques, capital use and capital formation, removal of uncertainty, etc.

2. Land tenure institutions affect technological and managerial innovations. As stated in an earlier section there exist land tenure structures which hinder both the adoption and implementation of technological innovations in agriculture.

It is worth emphasizing that an improvement in these land tenure

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1 It does not mean farmers should not have educational opportunities. However, in a relatively short period of time the lower level of farmers' education as compared to urban people is difficult to overcome. At any rate, sound settlement programs should include agricultural education, housing, credit, etc.
structures does not imply that the problem of technological advance
has been subdued but that it encourages the adoption and implementation
of better techniques of production. This complex and never-ending
problem is in close relationship with the stage of economic develop-
ment, research, educational level, dissemination of information,
capital supply, etc. In addition, the uncertainty always attendant
with new techniques is an obstacle to the agricultural workers' adoption of new techniques. In less-developed countries this is par-
ticularly important since many farmers live near, or at, the lowest
subsistence level. In other words, the penalties attached to the
failure of new techniques may mean starvation. DeGraff (13, p. 701)
views this problem in the following terms,

The major part, although certainly not all, of the farmers
of the less developed areas operate essentially to feed
their families directly from their farms rather than to
sell in the market place. Profit is not their motivation
nearly so much as survival. Their little crops of basic
food staples are their very existence. They knew that if
they do not harvest they will not eat. Thus, they seek
not the biggest crop but the surest crop. Their most
haunting fear is that things will get worse, and to their
way of thinking a change in their production methods may
have precisely this result. We must recognize that their
thought is not so much: "If it was good enough for grand-
father it is good enough for me." Much more nearly it is:
"Father and grandfather, and the generations before them,
each survived by doing it this way. Thus I am here. If
I do things the same way, I will survive — and my children
after me, if only they will follow the time-proven methods."
Vastly more generations of men have been stimulated by
this motive than by black ink in an account book.

However, to deal with the problem of comprehensible technological
advance is beyond the scope of this section. Therefore, effort will
be concentrated in the analysis of the effect of defective land tenure
structures on technological and managerial innovations.
To determine the most economically efficient farm size has been for many years, and it is at the present, one of the most controversial aspects of agrarian reform and in general, of agricultural development. With regard to agrarian reform this matter is particularly relevant when dealing with problems such as minifundia and latifundia, resource allocation, per capita productivity, employment, etc. For several reasons it is difficult to establish a general criterion of what is the most efficient farm size. Topographic and soil conditions, type of cultivation, managerial abilities, factor prices, risk and uncertainty, etc., are some of the aspects to be considered for this purpose (64, pp. 6-14; 53, pp. 110-115; 22).

While from a theoretical viewpoint equations I or II define the optimum farm size, the translation of this concept into the "real world" is difficult, if not impossible, because of the very nature of agricultural production. This task is even more difficult to achieve when agriculture is being transformed at a high rate, i.e., when the adoption of more economically efficient techniques implying different factor proportions is rapidly made.

However, when the supply price of capital is high relative to that of labor—a common situation in underdeveloped nations—the least-cost and economically most efficient organization of agriculture leans in the direction of labor technology. With approximately constant scale returns or costs for labor-type technology, small farms operated independently can probably be just as efficient as large plantations (21, p. 56). Of course as the same author says,

"the optimum organization of farms in respect to size,
numbers, capital requirements and technology in a broad sense is itself a function of economic growth and the conditions of capital supply (21, p. 569).

In the same manner as the impossibility of identifying the marginal value product for specific factors does not invalidate the usefulness of economic theory in the solution of problems of applied economics, the difficulty of determining in "practice" the accurate most efficient farm size must not deter us to reach a conclusion, at least, in relative terms, about the size of farm.

Small farm sizes impeding the application of present known technologies - or even those in a foreseeable future - should be substituted for larger ones. On the other hand, large holdings encouraging lesser use of land and/or embracing large idle areas prevent the adoption of more efficient technologies. In evaluating the economic effects of the latifundia, it is necessary to recognize that they are not necessarily inefficient from the viewpoint of the individual owner, given the extreme inequality of income distribution which exists in most areas where latifundia occur. The objective function of the landowner may not be profit maximization from his enterprise, but some acceptable level of income with social prestige and a minimum of management effort (23, p. 53). "The large landowners" as stressed by Dr. Timoens, "may be satisfied with the income he receives from extensive livestock production..." (59, p. 93).

To some extent, large holdings are withheld from both intensive cultivation and/or from cultivation (idle land) in Costa Rica. When land is withheld from intensive cultivation because of latifundia, "many cultivators are forced" to farm land of lower productive potential
(20, p. 390). Under these circumstances both the marginal value product of labor is diminished below the level that otherwise would prevail and less capital can be economically used since the marginal value product of capital per unit of area will decline more rapidly than in better quality of land. Potential capital formation is also adversely affected because of the lower level of income. Therefore, three of the essential elements of agricultural development fail to be fully fulfilled. When land is withheld from cultivation the same set of undesirable effects in so far as resource allocation as those present when land is withheld from intensive cultivation, can be applied. However, when expropriation of land is used to overcome this defect, the latter case differs from the former in that it does not even disturb the pattern of cultivation in the expropriated holding.

Small farm size not only prevents the use of more appropriate techniques of production — thus reducing marginal productivity of labor — but also impedes the achievement of increased efficiency through a better use of capital. Since income coming from minifundia is, in general, very low, the cultivator will attempt to maximize output in physical terms without any regard to relative prices. "Under conditions of starvation, the individual will work until the marginal product of his labor is driven to zero and its marginal value product is correspondingly very low." (20, p. 350)

To correct these defects — minifundia and latifundia — the Law enables the Institute to expropriate (with compensation) the land held

1The definition adopted by the Institute for these two concepts is given in Chapter IV.
by landowners. Lands so obtained by the Institute will be either resold to tenants, who are expected to pay for their plots in a period of thirty years, or used in settlement projects. Farm sizes to fulfill these two objectives will be determined for each instance taking into account soil conditions and type of agricultural activity.

Crop lands used for livestock activities fall within the concept of lands subject to expropriation.

Complementary measures to overcome the existence of idle lands, and, in an attempt to discourage excessive large holdings, are provided by the Law. A progressive tax on idle land in excess of 100 hectares is taxed on a sliding scale from 0.25 per cent to 2.5 per cent of the value per year, depending on the size. The revenue thus obtained will be exclusively used to finance the programs of the Institute. Two exceptions considered by the Law concerning expropriation are (a) farms not falling within the classification of latifundia but in which there are precarious occupants are subject to expropriation, and (b) farms with an area exceeding the limit set for latifundia but whose technical or economic performance is regarded as important for the country's economy, are not subject to expropriation.

The Law sets rules to avoid accumulation of land (latifundia) and/or fragmentation (minifundia) of lands that have been resold to tenants. While this provision of the Law has to be considered as important, unfortunately, it is not general, in the sense that it only refers to

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1The Law defines idle lands as "Those land areas which are in natural state or abandoned, and in which the owner by itself or through tenants or settlers has not undertaken the necessary works for cultivation or exploitation" (II, pp. 13-14).
holdings that have been transferred through the Institute.

Complementary measures for the attainment of the goals set by the Law are allowed for in both settlement projects and lands sold by the Institute to particular agricultural cultivators. They include the construction of access roads, irrigation projects, health and sanitation facilities, schools, rural housing projects, and other similar dispositions.

Measures to tackle the problem of minifundia are similar to that of latifundia, provided the necessary changes are made. The expropriation of minifundia allows for the resettlement of dispossessed cultivators.

In some instances it is argued that "small" farms hinder the use of better techniques, above all, those including the use of some kind of machinery, because of the presence of factor indivisibilities. This situation, although not very frequent under labor-type techniques, should not be overlooked. An agrarian reform program should be flexible concerning farm size. It must be born in mind that agrarian reform is a component of economic development and this concept is a dynamic one. Furthermore, when this process takes place, very often relative prices of factors change favoring the use of capital. This means that for every input mix "specified as optimum by input prices, a different size of average of farm is also optimum" (21, p. 172).

The Law allows, to some extent, for such flexibility. In the first place, it encourages the formation of cooperatives. Aside from the advantages of this type of association in so far as credit, it also enables relatively small farms to operate as larger units in certain operations such as purchasing, marketing and cultivation. It is well
known, comments Professor Heady (22, p. 87), the "degree of lumpsiness" of factors such as tractors depends on the manner in which the services of the resource are varied. It is true that,

If a tractor is purchased, the farmer must buy the complete stock of productive services involved in it. Yet the input of services need not be in this same lumpy manner. From the stock of services embodied in the tractor, any amount ranging from 1 hour to 1,000 hours can be used as an input in a single year (22, p. 87).

In the second place, the same definitions of minifundia (10 manzanas) and latifundia (1,000 manzanas) adopted by the Institute can be interpreted as allowing for the necessary flexibility concerning farm size.

The Social and Economic Development Plan set as a target "to continue with the elaboration and implementation of organised settlement program" (43, p. 69). Obviously, the achievement of this target implies expropriation and/or redistribution of public domain lands.

In the land distribution stage, care must be exercised for a "reasonable" balance between economic and non-economic (political and social) aspects. They are not independent and universally noncompetitive. Thus, for instance, land can be used to have more farms and a greater amount of social progress and political stability. If this measure brings about a decrease in production, ends are competitive. Or, "competition between ends may result where tenants lack capital for adequate farming after they are transformed to owners." (21, p. 534)

Considering this situation, and, aside from the supply of capital and management, Professor Heady (21, p. 534) says,

The technical nature of the production function is important in prescribing the long-run nature of the food and nonfood
production possibilities in using farm resources. Given one set of production elasticities, goals of political stability and distributive justice could be attained without sacrifice in food efficiency. But under other conditions of the production function, the ends are competitive and the community must balance more food from given resources against agrarian structure and small farms.

If the production function is of the nature in (III), where \( Y \) is output and \( X_i \) is input of the \( i \)th resource

\[
\frac{\delta Y}{\delta X_1} \cdot \frac{X_1}{Y} + \frac{\delta Y}{\delta X_2} \cdot \frac{X_2}{Y} + \ldots + \frac{\delta Y}{\delta X_n} \cdot \frac{X_n}{Y} = 1
\]

(III)

and if management and capital supply are the same after holdings are subdivided, the goals of food efficiency and those of distributive justice or social stability are not competitive. This possibility is illustrated in Figure 4A. Starting from a point like \( S_1 \), large farms can be subdivided into smaller units. Then, there will be a movement to the point \( S_2 \) or to the limit \( S_n \), "where other restraints place limits on gains in distributive justice or degree of political stability possible from subdivision of land holdings." Further, the same author stresses,

Given the technology currently found in many less developed economies, and favored by prices of labor relative to capital, it is possible that constant returns to scale do prevail or are appreciated. Aside from managerial and farm practice skills of the operator, cost economies associated with farms of different sizes are probably small or effectively non-existent for a labor-type agriculture. With high prices for capital relative to labor, labor-type agriculture is the most efficient in many less developed economies and the cost economies associated with mechanized agriculture are unimportant.

If the production function is such that

\[
\frac{\delta Y}{\delta X_1} \cdot \frac{X_1}{Y} + \frac{\delta Y}{\delta X_2} \cdot \frac{X_2}{Y} + \ldots + \frac{\delta Y}{\delta X_n} \cdot \frac{X_n}{Y} > 1.0
\]

(IV)

The production possibility curve denotes competition between ends, more
Figure 4. Alternatives in production possibilities in food production goals and other goals of reform
like Figure 4B. However, "this condition prevails for mechanized agriculture in a highly developed economy such as that of the United States", and, therefore, at the present, it is not relevant in the analysis of this study.

Another possibility arises from the consideration of the "orthodox production function of the economic text." This situation is illustrated in Figure 4C. Within the range of decreasing scale returns, "complementarity (positive slope of the opportunity curve) prevails between food and distributive or stability goals." It means that fewer, larger farms will provide more food production from given resources. This case is relevant for underdeveloped economies since,

This situation might prevail especially where large estates or plantations are held by absentee owners only for purposes of inflation hedging, gaming, "attainment of aristocracy", etc. (21, p. 586).

In Figure 4C, over the range of complementarity, a movement from $S_5$ to $S_6$ both the food and nonfood goals are increased. At point $S_6$ the opportunity curve attains a maximum and the production function shows constant return to scale. Beyond $S_6$ the slope of the production possibilities curve becomes negative (competitive relationship) as increasing returns to scale are encountered in the production function.

The remaining aspect of this section refers to fragmentation into noncontiguous tracts. It covers such cases where a holding having more than one tract of land is cultivated as a single unit. The major economic effect of this structural defect is to reduce the efficiency of labor. When a cultivator farms different and separated tracts of land, a great percentage of the farmer's working time may be lost in
traveling from one plot to another. Cost to the operator for the
concept of moving factors of production (seeds, animals, etc.) to the
different plots, returning crops to the farmstead, fencing particular
tracts, etc., are increased and, in addition, the efficiency of pro-
duction is reduced since it is more difficult to supervise the crops.
Similarly, "the choice of which crops to grow are limited by the con-
sideration that each landholder must have access to his holding,
reducing the over-all efficiency of the cultivator's labor and capital
usage" (20, pp. 333-334). Furthermore, the use of machinery sometimes
is hampered by the irregular shape of the fragmented holdings. When
fragmentation is present, soil conservation practices, and pest and
weed control require the cooperation of different owners which is not
always easy to achieve.

Nevertheless, Binns (5, pp. 5-6) considers moderate fragmentation
as desirable in such cases where orchards are farmed intensively and
there is risk of damage from natural causes, "in certain low-lying rice
areas which are liable to severe early flooding, it is advantageous to
have a small patch of higher land for use as seed nurseries,...", etc.

These exceptions of fragmentation considered by Binns point out an
important aspect. General solutions for agricultural problems are not
always the most appropriate. Thus, for instance, a consolidation pro-
gram to overcome fragmentation must take into account such exceptions.

Even though the information about this defect in Costa Rica is
not conclusive due to the definition of fragmentation adopted by the
Census Bureau of Costa Rica, it seems permissible to draw the conclusion
that such fragmentation exists. The magnitude of fragmentation in
Costa Rica at the present, however, cannot be determined. Aside from the exceptions already mentioned in this section for latifundia and minifundia, there is not legislation to ameliorate and/or to prevent the occurrence of this structural defect. Even if the conclusion on the existence of fragmentation may prove to be wrong, its prevention would be advisable.

3. Capital use and capital formation may be hindered by three classes of defects in land tenure structures. They are high fixed costs of ownership, high costs in operating land, and lack of opportunity and knowledge about the existence of alternative investment opportunities.

In the opinion of Hirschman, "the theory of investment has remained the most unsatisfactory aspect of the growth models..." (28, p. 33).

The same author further stresses,

"...Investment is still comparatively the most volatile and least predictable among the more important variables that are involved in the growth process. Harrod, Hicks and others have used the device of dividing ex ante investment in two parts: first, the "induced" portion...and secondly "autonomous investment"...This is of course a helpful first step in sorting out the known from the unknown factors in the determination of investment. But as long as there remains an "autonomous" investment, i.e., a portion that cannot be convincingly explained by economic variables, we are still without a comprehensive theory of investment (28, p. 33)."

Professor Schultz expresses a similar opinion but referring to the agriculture sector of less-developed countries when he asserts, "While agriculture is the oldest production activity of a settled community, surprisingly little is known about the incentives to save and invest where farmers are bound by traditional agriculture" (53, p. 111). While boring recognizes, "The fundamental economic condition for
growth in agriculture is an adequate investment" he observes, "Historically however, in all parts of the world there appears to have been a resistance to the flow of capital into agriculture in adequate quantities...." (6, p. 303). He argues that agriculture must compete with industry for this capital and "Because industrial opportunities may offer greater short run gains, they are likely to be given priority" (6, pp. 303-304). Capital formation within agriculture arises from savings, which are the excess of net productivity over consumption. Consumption in less developed countries is already extremely low. Thus it is difficult to see how consumption could be further decreased as a source of savings and the political stability of the country still be maintained. Therefore, agriculture must depend on capital formation through increased productivity, on the prevention of "leakages" of capital and on outside capital (59, p. 93).

Opinions, in so far as the possible effects of an agrarian reform program on the level of investment, are split. Thus, for instance, Tuza points out, "...Reinvestment by small farmers is too small and inefficient to contribute to capital formation" (62, p. 272). On the other hand, Warriner holds the following standpoint.

The general economic argument for reform of the agrarian structure in underdeveloped countries is that existing land systems accentuate the shortage of capital and prevent investment, because they give rise to incomes which are not used to improve agricultural production or to invest in the land. Large landowners spend conspicuously..." (70, p. 7).

If it is true that there are different viewpoints concerning investment, several conditions may facilitate investment in agriculture of less-developed countries. Among these favoring conditions are:
(a) the incentive of a profit; (b) improvement of certainty expectations; (c) increase in per capita productivity; (d) dissemination of information, technical education and applied research directed to take advantage of pure or fundamental research which is produced in other countries and which is available at little or no cost; (e) the supply of capital; and (f) factor and market structures. Within agriculture these conditions are favorably or unfavorably affected by land tenure structures. In other words, structures can facilitate or hamper the achievement of these essential elements for agricultural development.

High fixed costs of ownership may take three major forms: high amortization payments, high interest rates on long-term capital, and high taxes. These types of defects engender similar resource inefficiencies: they discourage capital investment and favor crops planned over a shorter period of time and of labor-intensive nature. "Excessively high tax rates or inequitably levied taxes will also tend to reduce the capital investment in the farm firm, will shift the resource allocation to shorter term enterprise combinations and will reduce incentives for investment" (29, p. 411).

To determine the appropriate level of taxation, rate of interest or amortization is difficult in practice. However, those levels which threaten the achievement of the essential elements of economic development stated in the means-ends-continuum may be regarded as high. Thus, for instance, high taxes, interest rates or amortization payments which drive levels of living below the subsistence norm seem to be excessive. Gittinger estimates, "The best working definition of high taxes would relate more to the effect of the total tax burden upon resource
allocation in relation to more desirable means of assessment and collection" (20, pp. 413-414). Further he stresses,

...taxes stated in fixed monetary terms on land units may be excessively heavy in times of poor prices and of unimportant significance in time of high prices. Taxes levied on a presumptive basis may not be adequately related to actual incomes. Or taxes which penalize added income from agrarian development or reduce incentives for capital investment below the level which more suitable alternatives might take possible could be considered high (20, p. 414).

In the case of tenancy, high cost to the owner represented by taxes are not limited to owner-cultivators. Given the power position of the landlord in relation to the tenant, a tax on land can be shifted to the tenant. Shifting taxes, however, can be avoided by establishing effective rent maximums. In this vein Wald points out, "If the rental taxes are subject to governmental control...the government has a convenient tool for regulating the extent of tax shifting from landlords to tenants" (69, p. 199).

Obviously, rate of interest higher than its marginal value product contribution will hinder capital formation and capital use. Often times, when sectors are not integrated, i.e., when factors of production do not move freely from one sector to another, it is not uncommon to find high differential rates of interest among sectors. This situation, which is frequent in less-developed economies tend to favor non-agricultural sectors through lower rates of interest. Uncertainty, greater short-run opportunities in non-agricultural sectors, and defective market structures of capital are some factors explaining the occurrence of this phenomenon.

As stated earlier the transformation of the agriculture from a
subsistence to a commercial state requires capital investment. Capital shortages may take specific forms such as land improvements, livestock quality, etc., but it may also exist in general forms such as the supply of available cash or credit. Oftentimes improving the supply of credit implies, if new techniques of production are adopted, that a new set of inputs must be used by the farm firm and complementary investments must be made.

Amortization payments sharing a high proportion of cultivator's net total product place similar undesirable consequences on resource allocation to those arising from high taxes and high rates of interest. High amortization payments coming out of high land values bring about both an undesirable income distribution and failure to satisfy the condition that factor rewards must be in accordance with their marginal value product.

Loans granted by the Costa Rican banking system to agriculture have been made at reasonable rates of interest - 6 to 9 per cent annually, depending upon the type of collateral and period of time - relative to those exacted in other underdeveloped countries. Interest rates assessed on loans to be used in different productive activities are quite similar. This is an important aspect in loaning since it eliminates the existence of high differential interest rates among sectors.

1Schultz observes that the quantity of material capital "of the conventional sort employed in agriculture" is unimportant. "The quality of the material capital employed in agriculture does matter significantly... however the key variable in explaining the differences in agricultural production is the human agent." (53, p. 17)

2See the example (64; 20; 5).
However, given the supply of credit provided by the banking system is insufficient to satisfy the demand for capital\(^1\), problems concerning the rate of interest and differential rates among sectors still persist. One aspect of the standing loan system which can be deemed as an obstacle for using credit is that collateral securities as loan support are a prerequisite to be eligible for loaning. "Productivity may be substituted for collateral as loan support" (59, p. 96).

While private credit on the basis described in Chapter IV can be viewed as desirable\(^2\), given it is supplied at low rates of interest, moneylenders and local merchants will hardly ever deserve this consideration. Even though there is not a quantitative measure for rates of interest charged in operations between farmers and moneylenders or local merchants in Costa Rica, experience from other countries shows that, as a rule, extremely high rates of interest are exacted in these transactions (59; 63; 20; 5; 18).

The Law allows for the supplying of credit - through the banking system - to landowners of small and medium size holdings (excluding minifundia and latifundia), agricultural and/or livestock co-operatives, and settlers, at low interest: rates of six and four per cent are

\(^1\)Moreover, the agrarian reform program, with compensation, will exert even a heavier pressure on the credit supply for two major reasons: (a) establishment of settlement projects and more particular farms will need credit for their efficient operation, and (b) the law's implied policy tenet that ownership is the only means to overcome some types of structural defects will add pressure on capital supply. In fact, if increased farming efficiency is pursued, it is possible that capital requirements per farm would be greater than those now prevailing.

\(^2\)This source of credit, in addition, may be an efficient form for agricultural extension.
assessed for individual owners and co-operatives, respectively. This is one of the measures taken by the Law to encourage formation of co-operatives. Rules are not set in the Law for the provision of credit to farmers under any type of tenancy, but exceptions are made for the cases in which the Institute rents or subrents farms to cultivators. On the other hand, the Law allows for supplying credit to tenant cultivators who want to become owners. This provision, while preventing the occurrence of high amortization payment which is important given the apparent high land value in the country, leaves farmers out of the program who wish to farm under tenancy. It seems logical to conclude that if they lack the necessary monetary funds for farming, they will have four ways open: (a) to obtain private credit, if available, (b) to fall in the hands of moneylenders or local merchants, (c) to quit farming, or (d) to continue farming under economic inefficient conditions.

In the Social and Economic Development Plan of the country there are several targets directed to improve the agricultural credit situation. Of great importance is the study the Inter-American Committee for Agricultural Development was making about financial, technical and institutional aspects of agricultural credit in Costa Rica. It will provide the basis for the evaluation of the present agricultural credit structure and hence will redirect the agricultural credit policy. The provision of credit for the achievement of the objectives stated in the Law is widely stressed in the Social and Economic Development Plan.

Credit and above all credit at "fair" rates of interest is strategic to increase per capita output in agriculture. However, not
only the supply of credit the farmer faces is important. His borrowing
capacity also matters. "Credit is subject to use, allocation, and
development, as is true generally of inputs. It is a peculiar input
in that its quantity depends upon evaluations made by lenders available
to the borrower. For other inputs, evaluations of potential buyers are
in terms of price" (2, p. 122). To illustrate how credit is used and
its effects in the economic organization of the farm firm, we can use
Figure 5 (2, pp. 122-124). It shows how a farmer decides to use a
given factor X (credit). It yields increments to returns indicated by
its marginal value product (MVPX) and is priced at \( \frac{1}{2} \). If there are
not restrictions in the farmer's access to credit (X), he will maximize
his returns by using \( X_b \). At this level of use, the returns above
variable cost are represented by the area CoAE. If access to X is
restrained, let's say, at the absolute level \( X_R \), the use of credit
will be reduced from \( X_b \) to \( X_R \), and earnings will be represented by the
area CoARE. The excess of demand for X with respect to supply of X is
represented by BRE.

Even in the absence of fixed constraint, access to X may be
restrained by the borrowing capacity of the farmer. The Kaleckí's
principle of increasing risks suggests that the effective cost of
adding more and more units of capital increases - and hence the "real"
marginal cost of X slopes upward, e.g. CoF - if capital is borrowed.
This is because there is a threat to one's equity as borrowed capital

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1 The situation of a "price" for credit equal to Co for any amount
of X is of pure competition. However, this condition in the case of
Costa Rica is met, since no differential rates of interest are assessed
on the magnitude of loans.
Figure 5. Credit constrained optima in use of a variable input
increases relative to total capital.

The Kalecki's principle of "increasing risk" is another important element to consider at least when the farmer's borrowing capacity is limited. (It supports a system of tenancy similar to that already commented upon in this chapter.) While owner-occupiership is perhaps the best means to overcome some defects affecting incentives for the cultivator to increase his productivity, a good approximation to it can be equally reached by means of a well-designed tenancy system which in turn, may spare the farmer's monetary resources. These funds may be used to enhance the farmer's borrowing capacity.

Agricultural taxation in Costa Rica apparently has not been a heavy burden that has distorted the optimum resource allocation. However, the very same lack of reliable property transfers and control on land valuation are causes of both inequitability of taxation and an inefficient source of revenue.

Aside from the innovation of taxation to discourage large idle holdings and other important measures commented latter on, neither the Law nor the Social and Economic Development Plan considers comprehensive changes in the agriculture taxation structure.

A relatively low taxation burden in agriculture does not mean it is the most desirable scheme for developmental purposes. In other words, a taxation scheme for agriculture should be designed to facilitate and encourage development.

Incentive taxation pursues to affect economic activity basically through the structure of the tax system rather than through the absolute level of taxation. Since these incentive measures should be
aimed to production purposes, the cultivator must be the object of
incentive taxation.

In this respect Heller (26) offers several measures to attain
these purposes. He groups them into different categories which are
summarized below:

a. Taxes to increase incentives to work. It may be pursued either
through reductions of high marginal rates of income or produce taxes
or, by replacing taxes which respond directly to the size of gross or
net output with taxes which are fixed in amount or only indirectly
responsive to changes in output. The target of these policies is to
levy taxes in such a way as to leave the rewards for additional effort
undiminished.

b. Taxes to increase incentives to invest. They deal with a
longer-run incentive than those included in the previous point. "The
general approach is to grant exemption or preferential treatment under
land, property and income taxes to improvements in and structures on
the land, mainly by the landowner.

The Costa Rican agrarian Law exonerates cooperatives and culti-
vators under the Institute programs the payment of any tax on machinery,
tools, agricultural implements or any other factor of production used
by them. The measure, while directed mainly to the exemption of
import taxes, is relevant since these factors of production are almost
all imported.

c. Taxes to discourage undercultivation. This type of penalty
tax has been enacted in Costa Rica to discourage lower uses of land.
d. Taxes to channel resources into particular crops. This incentive measure involves a change in land utilization by taxing or subsidizing particular crops. "They seek to redirect agricultural effort into channels which serve certain aims of national policy."

e. Taxes to promote certain forms of ownership. Special tax reductions or tax exemption for a period of years after the cultivator acquires title is one device applied in this context. Another is to tax rents more heavily than owner incomes under an income tax. The former type of incentive tax is considered by the Costa Rican Law. Cultivators who have acquired ownership or have become settlers under any program of the Institute are exempted of all kinds of taxes on land for a period of five years.

f. Taxes to discourage land speculation. These levy heavy duties on the incremental value of land at the time of transfer. Oftentimes value increases coming from land improvements are exempted.

g. Taxes to alter the relationship between agricultural and other sectors. This would include not only taxation designed to effect a direct income transfer, but also to encourage movement of resources, especially labor, from one sector to another.

High fixed costs in operating land arise because of unduly high rents, defects in factor and product markets and high interest rates in operating capital.¹

Rent on land should perform an economic function in the allocation

¹High interest rates on operating capital and high interest rates on long-term capital have been discussed together in the former section. Therefore, it will not be commented on again.
of resources. Oftentimes the economic analysis proceeds in determining the rental value of land by using the demand and supply analysis as if its value were determined exclusively by economic factors operating in a competitive land market. When the Ricardian concept of land rent is brought into consideration, one of the assumptions of the former analysis is dropped: homogeneity of land. The analysis, however, is not taken beyond this point very often.

Land is a factor of production which shows peculiar characteristics. To begin with, land is an immovable factor; that is, it cannot be taken from one place to another as happens with other resources. For obvious reasons, land cannot be considered as a homogeneous factor if one wishes to come to grips with the "real world". Land must be considered, in addition, as having two components: (a) "the original and indestructible powers of the soil", and (b) improvements and/or conservation works made on it. On the other hand, for practical reasons, land supply cannot be augmented beyond its maximum absolute.

It is difficult to see how land and rent on land can be determined only by economic factors in a competitive land market when land

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1Ricardo reasoned that rent arises on land because the pressure of population brings different grades of land into cultivation. In the face of equal prices in the market, the better grades yields a greater return to the owners than the poorer do. Ricardo maintained that the amount of rent for any given plot is determined by the excess of its yield over the yield on "marginal land," defined as the poorest land in actual cultivation, since the latter produces just enough to cover production costs, including the wages of the cultivator, and leaves nothing for rent. From this theory it follows that a tenant farmer can afford to pay the landlord as much as the full "differential rent" and still retain the ordinary rate of return for his labor and capital (69, p. 14).
transactions and tenancy arrangements are very seldom made, when they are exposed to subjective appraisal and when landowners hold a strong bargaining position with respect to landless farmers.

Land rent, under these circumstances, may be quite higher than its marginal value product. High land rents will reduce savings possibilities to the cultivator and, therefore, potential investments are diminished. In this manner, two of the essential elements for agricultural development—rewarding factors according to their productivity and income distribution—will fail to be fulfilled.

Obviously, the land rent problem is more acute when lack of opportunities in agricultural and non-agricultural are present and/or when the cultivators' educational level is low. Without such opportunities and capabilities, persons who must earn their living in agriculture have no choice but to bid up the price for land resources and accept a low return on their own resources. Gittinger observes, "The high fixed cost to the tenant operator skews the allocation of resources, since the tenant no longer has the incentive to move toward the optimum enterprise combination for the farm firm as a whole. This in turn will lead to reduced efficiency of labor, and to an allocation of capital in a manner which does not result in the greatest efficiency, considering the firm as whole" (20, p. 324).

So far we have been looking at one side of the coin. Land rents below their marginal value product will not only bring about a resource allocation different from the optimum\(^1\) for the farm firm but also will

\(^1\)Of course, the reasoning is applicable to all other factors.
encourage agricultural activities in land areas which are not the most technically suitable for such purposes. Remedial measures to overcome high land rents are rent reduction and control. This is one of the instances in which we must bear in mind, "The price mechanism is neither better nor worse than other human creations; that is, it serves to fulfill certain limited functions and, if it is cleverly used, it will provide satisfactory results. Perfect solutions should not be expected from any human institution: mankind's religion preserves perfection for life after death" (3, p. 17).

As quoted early, the situation in Costa Rica with respect to the Law's viewpoint toward tenancy has already been commented upon. However, since tenancy, being an alternative means to land ownership, can be important in the short-run, mainly, because of agrarian reform financial considerations¹, and in the long-run due to the fixed supply of land, provisions upon land rent should be taken. At any rate, even if owner-occupiership is regarded as desirable, measures to increase tenant security and to reduce high fixed costs in operating land during the transition period can contribute to the smooth working of the redistribution program. About this phenomenon Tang (56) reports that in Formosa, soon after the rent reduction program was initiated, there was "witnessed the drop of land prices" and the "weakening of the landlord's desire for land ownership". In this sense, a rent reduction program would be complementary to the progressive tax on idle land.

¹In this vein the National Planning Office reports, "Activities of the Institute have been limited by a lack of adequate financial support. The implementation of the programs leading to the achievement of the Institute's objectives...demands great capital investment" (43, p. 20).
The Law delegates powers to the Institute for renting land. The objectives of these operations are two fold: (a) to subrent these lands to tenants, and (b) for the development of settlement projects. Land rents for these two purposes are fixed in monetary units. Theoretically this fixity on land rents may cause either overvaluation or undervaluation of land in terms of its marginal value product, although undervaluation is perhaps the most probable outcome. The Social and Economic Development Plan, however, does not specify any target variable for the Institute to rent land.

Defective factor and market structures exert similar consequences on capital formation and capital use to that of high rents and high rates of interest. This implies both the level of production will be less-than-the optimum since the reduced investment will shift the resource allocation to shorter term enterprise and labor-intensive technologies will be encouraged. When factors of production are unavailable or available at prices higher than their marginal value contribution, the use of the most efficient resource combination for a given technique will be hindered. Similarly, when the product marketing process is charged a high portion of the final value of the product, rewarding factors in line with their marginal productivity will be impossible. The existence of this defect, in turn, will hamper the achievement of a greater income distribution.

As stated by Professor Fletcher, "The most obvious connection between marketing and production is the purposeful use of price incentives to stimulate output" (15, p. 135).

This relationship can be illustrated by using a Cobb-Douglas
production function. Thus, for instance, if we consider a production
function of the form
\[ Y = ax^b \]  
(V)
where \( Y \) is production level, \( a \) and \( b \) are elasticities of production,
and \( x \) is any factor of production. From (V) we can derive the supply
function which will be of the form:
\[ Y = (p_y p_x^{-1} a^{1/b} b)^{b/(1-b)} \]  
(VI)
If we assume \( a \) and \( b \) constant, the output level \( Y \), will depend on
\( p_y \) (price of the product) and \( p_x \) (factor price). If \( p_y \) is reduced in
(VI) \( Y \) will be decreased and vice versa. On the contrary, if \( p_x \) is
reduced in (VI) \( Y \) will be increased and vice versa.

\[ ^1 \text{Obviously the production function may include as many variables as it is desired. However, for the sake of simplicity only one variable was used.} \]

\[ ^2 \text{Let} \]
\[ Y = ax^b \]  
(1)
be a production function, where \( Y \) is the output level, \( a \) and \( b \) are
elasticities of production, and \( x \) is any input. From (1) solving for
\( x \) we have
\[ x = Y^{1/b} a^{-1/b} \]  
(2)
which is a requirement equation. The total cost function is
\[ TC = K + p_x \cdot x \]  
(3)
where \( TC \) is total cost, \( K \) stands for fixed costs, \( p_x \) is the price of
\( x \), and \( x \) is the amount of factor \( x \).

From equation (3) we can derive the marginal cost equation,
\[ MC = \frac{\delta C}{\delta Y} = b^{-1} p_x a^{-1/b} Y^{1-b} \]  
(4)
If the objective function of the farmer is profit maximization he will
use factor \( x \) at a level at which \( MC = p_y \). Therefore,
\[ MC = p_y = b^{-1} p_x a^{-1/b} Y^{1-b} \]  
(5)
From (5) we can solve for \( Y \)
\[ Y = (p_y p_x^{-1} a^{1/b} b)^{b/(1-b)} \]  
(6)
While several Costa Rican governmental agencies are in charge of the marketing process of both factors and products, their success has been limited. On the one side, the program leaves out many commodities. The existing market environment in and around agriculture often exposes producers of these left-out-commodities to exploitative middlemen and moneylenders. Furthermore, it does not usually guarantee access to critical input at "fair" prices, and oftentimes, it offers little, if any, incentive to farmers to acquire cash beyond the most essential needs. This market structure neither encourages farmers to produce more nor to market much of what they produce. On the other side, support prices, which should serve as producer's incentive, have been high. In fact, a price policy of this sort should be adequate to solve two sources of conflict: low food costs for consumers, and incentive prices to producers. When income per capita levels are low, people may go hungry when the food they need costs more than they can afford to pay. If this condition prevails, the subsistence norm would fail to be achieved. Alternatively, as can be easily seen in supply equation VI, low commodity prices will reduce supply. At this point marketing charges are equally important. Of course, "Production will not be profitable if marketing charges are excessive relative to final value of the product" (16, p. 137).

The Social and Economic Development Plan set as a variable target the construction of a wholesale market in the city capital. This step, no doubt is important. However, it is not at the root of the marketing
problem. But agricultural cooperatives are. They offer one of the most promising avenues for the solution of this defect. A reorientation of the Consejo's policies and an accelerated and careful development of cooperatives may be the most appropriate, if not the only, solution for this structural defect in the foreseeable future.

Lack of opportunity and knowledge to channel savings into agricultural investments causes hoarding, conspicuous consumption, etc. (39, p. 94). Moreover, "with respect to savings and capital," Hirschman observes, "anthropologists have long known that...people who, by Western standards, live 'on the margin of subsistence' insist nevertheless on devoting a considerable portion of time, energies, and resources to...activities not directly related to consumption" (28, p. 36). Allocation of resources and energy in such activities evidence the need and possibility of channeling them into productive activities. The process of giving opportunity and spreading knowledge upon the existence of alternative investments is in close connection with, and must be regarded as an aspect of, dissemination of information which is considered as an essential element for economic development in this work. While information is essential in the use of capital and other factors of

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1Professor Fletcher holds this same viewpoint when he observes, "...possibly...because marketing arrangements in most underdeveloped countries typically present an untidy and chaotic appearance, marketing is often considered a fertile field for reform. This is reflected in the penchant of policy makers for improving physical marketing facilities, especially central wholesale markets. Concern for market outlets and physically efficient marketing facilities is not misdirected. It casts marketing in a passive or facilitating role...but markets and marketing may also play an active role in the developmental process" (18, p. 133).
production so as to secure increased efficiency which, in turn, will provide greater capital formation potentialities, it is, in fact, basic for the fulfillment of every one of the essential elements for economic development. "Successful adjustments to promote agrarian and economic development are hindered by both a lack of information anywhere in the society which can be overcome only by research and by a lag between the acquisition of information and its application by individual cultivators on their own holdings, which calls for various educational measures" (20, p. 431). T. W. Schultz considers the key to growth is in acquiring and using effectively some modern factors of production. This implies investment in "human capital" which he considers "as a major source of economic growth from agriculture" (53, p. 176).

According to her per capita income level Costa Rica has a good standing concerning the level of literacy. As stated earlier, only 18 per cent of the total population of the country is illiterate. The country, however, has experienced serious problems of agricultural education at all levels.

Aside from the existence of a lower rate of literacy in rural areas relative to urban areas, the country’s pattern of education has apparently given too much emphasis to the humanistic-type of education and very little stress to technical education. Education, while regarded as an investment, can be either of a demand-increasing type or supply-increasing nature (or both). The former kind of education, while providing a basis for increasing productivity, does it at a slower rate than the latter. The necessity of de-emphasizing such
humanistic methods of education and of emphasizing those which stress aspects of production is set as a variable target in the Plan. Since the country already has different governmental agencies devoted to extension, research, education, etc., the Plan considers improvements (mainly, greater number and better trained professionals, better coordination among these agencies, etc.) but not the establishment of new ones.

The last topic to be considered in this chapter deals with the method of compensation adopted in agrarian reform schemes. Previously quoted in this work was the interrelationship between agricultural development and the overall economic development. Similarly, the effect of lack of alternative opportunities to invest and its possible consequences (flight capital, conspicuous consumption, etc.) were also commented on. These two concepts are in close connection with the form compensation payments take. Compensation can be made through cash payments or bonds. If the cash-payment-method is selected to compensate expropriated landlords, there exists the possibility that these monetary funds will be channeled into consumptive or any other non-productive activity. If the expropriation stage proceeds rapidly, the threat of inflation will impinge upon the economy and possibilities of credit will be diminished if the government is financing both credit and expropriation. When compensation is made through bonds, three possibilities are open: negotiable bonds, non-negotiable bonds and

1 If the government has enough monetary funds to carry out both compensation and provision of credit, the threat of inflation is greater.
bonds that can be interchanged for industrial shares. Negotiable bonds, while not affecting the credit condition as heavily as compensation made through cash payments, might have the same effects in concerning the allocation of monetary funds provided they can be sold in the market.

If compensation is made through non-negotiable bonds, capital leakages (flight capital), conspicuous consumption, etc., will be postponed and, in the meantime only interest payments can be used for those purposes. Neither of these two schemes, however, provide monetary funds for productive activities.

Through this work both the contribution of agrarian reform to overall economic development and the requirement of development in non-agricultural sectors in order to absorb resources released by agriculture, above all, labor have been stressed. Most of today's less-developed countries have undertaken programs of industrialization as a means to achieve this objective. However, one of the obstacles impeding a more dynamic industrial development is lack of savings. At this point, the third method of compensation through bonds matters. A "special fund for industrial investment" may serve for this purpose. This "fund" would issue shares and obligations which can be interchanged by agrarian reform bonds. Owners of the shares issued by the "fund" would share on the profits accruing from investments made by the "fund", but they will not have control either in the decision-making process or in administrative procedures. Such a program, however, needs

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1This idea was developed by the Mission Iowa to Peru. See (67).
financing. Bonds that have been interchanged for industrial shares provide the basis on which financial support can be obtained. Several international institutions such as the International Bank for Development, International Bank for Reconstruction and others may finance such transactions. These funds may be directed to finance industrial enterprises in which the country has special interest.

The Land and Land Settlement Law specified compensation will be made in cash or payments through bonds, the decision being made by the Institute. No specification is made if these bonds are negotiable or non-negotiable but a procedure like the one proposed here is not suggested.

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1Vignon observes there is no one legal obstacle for these institutions to finance this type of program (67, p. 18).

2Since underdeveloped countries, in general terms, do not produce capital goods, which have to be imported, the inflationary threat is thus reduced.
VI. SUMMARY AND RECOMMENDATIONS

A. Summary

The central objective of this study has been to analyze the conditions under which the agrarian reform in Costa Rica could be instrumental to agricultural development and hence to economic development.

The general objective assumed and suggested several hypotheses to direct and control the inquiry. Three categories of hypotheses were developed, namely, problem delimiting hypotheses, diagnostic hypotheses and remedial hypotheses. These three sets of hypotheses were essential 1) to identify the gap between the goals pursued and the present situation, 2) to identify and measure insofar as possible, failure and success elements arising from the analysis of the Law as a means to achieve the developmental goals, and 3) to remove failure elements and expand success elements identified in 2).

The analysis assumes land tenure structures can facilitate or hinder the achievement of the developmental goals by affecting incentives for the cultivator to increase his productivity, the adoption and implementation of technological and managerial innovations, and capital use and formation.

Given the goals set in this work for agrarian reform are not contradictory either with those set by the Social and Economic Development Plan of the nation for the agricultural sector of the economy or with the objectives of the Law; the proposed analysis, it is hoped, will reveal the ability of the present land tenure setting of the country to achieve the pursued goals.
Once the area of interest for this study, within the means-ends-continuum, was delimited and the sought objectives identified, the analysis was centered on the essential elements of agrarian reform as a vehicle for the achievement of agricultural development. In formulating this phase of the analysis it was assumed that incentives, technological innovations and capital were these essential elements. The analysis proceeded by attempting to answer the following questions:

1. How do particular land tenure institutions affect adversely or favorably the incentives for cultivators to increase their productivity, given ample capital and knowledge?

2. How do particular land tenure institutions affect favorably or adversely knowledge in the form of technical and managerial innovations in agriculture, given ample capital and incentives?

3. How do particular land tenure institutions affect adversely or favorably the formation of capital and capital use, given the incentives to use capital and the necessary technical and managerial knowledge?

To answer these questions as applied to Costa Rica it was necessary to appraise the existing land tenure situation before the promulgation of the Law. To answer the first question several land tenure conditions were considered. They were: uncertainties arising from conditions of tenure caused by lack of secure title to land, occupational immobilities, possible loss of ownership because of price and yield uncertainties and high fixed mortgage commitments, and rewarding factors in accordance with their marginal value product contribution. Minifundia, latifundia and fragmentation into noncontiguous tracts were used to explain the second question. Lastly, high fixed costs of operation and
ownership, factor and product markets, high land values and lack of opportunity to channel savings into alternative opportunities supposedly are land tenure institutions impeding a more accelerated capital use and formation. In addition the population problem facing the country, and its possible incidence in the economic development process, were briefly reviewed.

In Chapter V the analysis proceeds by pointing out the expected misallocation of resources that defective land tenure structures causes. In this phase of the study the country's efforts to subdue these undesirable consequences are evaluated in terms of their ability to fulfill the gap between the existent situation and objectives. For this purpose the major provisions of the Law and other related institutions, as well as the variable targets set by the Plan for the agricultural sector, are considered. This stage of the analysis implicitly encompasses the identification of success and failure elements. Finally, remedial alternatives to correct defects in the land tenure arrangement of the country - identified in the foregoing phase - are offered. This part of the analysis includes expansion of the success elements of the Law.

B. Recommendations

Based on the analysis presented in the foregoing chapter, ameliorative measures to overcome defects in the land tenure structure system of the country are suggested below. They include expansion of success elements and/or removal of failure elements as indicated in the analysis.
1. Defects in land tenure institutions adversely affect the necessary incentives for the cultivator to increase his productivity. Two major forms may be followed in adopting patterns of remedial alternatives to overcome uncertainty regarding cultivators' future control over the land resources: owner-occupiership and improving tenancy conditions. While the former solution completely eradicates these kinds of uncertainties it may impose a heavy burden on the availability of monetary funds which otherwise would be used for productive purposes. The latter solution, according to the circumstances cemented upon, may be a good approximation to ownership concerning resource allocation. Empirical evidence on the economic performance of well designed tenancy arrangements was pointed out in a foregoing section. Aside from the need of sound tenancy regulations for reasons outlined in previous chapters, tenancy is relevant to Costa Rica since both the Institute and the banking system have limited monetary funds and the same agrarian reform progress will exert an added pressure on the monetary supply. The suggestion made on this respect is that ownership and tenancy are complementary remedial alternatives to this defect and not competitive ones. Renting land is not totally overlooked by the Law. There are regulations for the Institute to rent lands. However, the Institute, when renting lands to landless tenants, will do it under tenancy arrangements that fail to fulfill the conditions for tenancy to be an efficient means for the optimal resource allocation. Proper changes in the Law must be made to overcome this failure element.

Concerning secure title to land, both the Law and the Plan include measures to subdue this defect that must be considered a complete
success. Insofar as there is possible loss of ownership, because of yield and price uncertainties, two remedial measures are necessary. Ameliorative measures to overcome yield uncertainties call for crop insurance. Price uncertainties require governmental intervention through well designed support price schemes. Crop insurance has not deserved consideration either by the government or by the Law. Evaluation of the price support program was set as a target in the Plan. The results of this effort and the policy implications arising from it are not available.

Transferring rural workers to other areas through land settlement projects is another success element of the agrarian reform program. Both the government (through the Plan) and the Law emphasize the need for complementary educational measures, overhead capital investment and other important social works. One of the objectives set by the Plan for the manufacturing industry is "geographical decentralization" of this activity. It might be a complementary source to absorb resources released by agriculture. Of course, the rate and pattern of development of the overall economy is a more general form of avoiding the problems of excess population in agriculture.

2. The Law considers expropriation of minifundia and latifundia. Expropriation of minifundia allows for the resettlement of disposed cultivators. Formation of cooperatives, on which the Law places great emphasis, can be regarded as a complementary aspect of resettlement. An important innovation introduced by the Law is legislation to avoid the recollection of further parcellation into small holdings (minifundia). Unfortunately, this measure is not general in the sense that
it deals only with holdings that have been transferred through the
Institute. The norm to which it is desirable to extend this provision
must be to prohibit, through legal provisions, the breaking up of
tracts beyond certain size. Of course, they would be subject to expro-
priation but this process would cause an unnecessary waste of resouces.
This same lack of generality is observed for latifundia. However, the
problem is not as important as in the case of minifundia for two
reasons: (a) nobody will be encouraged to accumulate land for non-
productive objectives if it is subject to expropriation, and (b) there
is a progressive tax on idle land to discourage, among other things,
land accumulation for those same purposes.

Aside from the defects commented upon, expropriation must be
regarded as a success element of the Law. Given compensation is made,
land accumulation for purposes other than production cannot be sub-
stantiated either in economic terms or in social and political grounds,
above all, when these lands are supplied with basic overhead capital
and, therefore, are suitable for cultivation which might bring about an
increase in per capita productivity (e.g. settlement projects).

The Law does not set rules for overcoming fragmentation into non-
contiguous tracts. The occurrence of this defect seems to be a
characteristic of the land tenure setting of the country even though
its magnitude could not be determined. The most direct remedial measure
to overcome the effects of noncontiguous tracts is to consolidate
scattered holdings into more rational units. This process, Bins
 commentator, is quite expensive. Compensation for land acquired for
consolidation, cost of public operations such as surveying, construction
of roads, administrative costs, additional overhead investment, resettlement of dispossessed cultivators and other expenses must be made to accomplish consolidation (5, p. 13). Furthermore, the consolidation stage raises social (emotional) problems which may hamper its achievement. A consolidation scheme must be followed by legal measures to prevent reoccurrence of fragmentation. Similar considerations would apply for the prevention of this defect.

3. Defective land tenure structures associated with capital formation and use are referred to as high fixed costs of ownership, high fixed costs in operating land and lack of opportunity and knowledge upon the existence of alternative investment opportunities. The first of these concepts includes: high rates of interest, high taxes and high amortization payments. While the present agricultural taxation in Costa Rica is apparently low, changes in its structure, as to make it a development tool, were advanced in the foregoing section. Inequitabilities arising from lack of reliable property transfers and land value control, however, seem to be number one in priority. As long as this situation remains unchanged, other measures directed to the use of taxation for production incentives purposes will become meaningless. The cadastral survey which was begun recently in Costa Rica will provide the basis on which this defect might be remedied.

With respect to the credit situation, government-sponsored credit programs and cooperatives are the major remedial alternatives to overcome this defect. Such credit schemes should be flexible enough so as to permit productivity to be substituted for collateral as loan support. The tenancy program advocated in this work as an alternative
to ownership would fail to a great extent if this flexibility is lack-
ing. While the presence of moneylenders and local merchants is
regarded as undesirable because of its adverse effects on production
and distribution of income, additional credit at "fair" rates of
interest is necessary to replace these former sources of credit. In
general terms it means the supply of credit must be expanded and/or
the credit structure of the country must be changed. Overcoming high
amortization payments is also related with the long-term agricultural
credit supply. In addition, rent reduction and control may drive down
land values when "investment" in land is made for other reasons than
production. This, incidentally, will tend to lower amortization pay-
ments.

Rent reduction programs have been implemented in countries such as
Pakistan, India, Mexico, Phillipines, etc. Costa Rica may draw valuable
experiences from these countries. The Phillipines' experience, mainly,
provides one of the most sophisticated methods of rent reduction in
which the rent level varies with the productivity of the land - a first
approximation to changing the rent in accordance with the marginal
value productivity of land - and in which marginal value productivities
are assessed on different factors so that the factor owner shares the
total product coming from the crop in proportion to its factor contri-
bution (64; 65). This arrangement, to the extent it is carried out,
would go a long way toward meeting Halburt's incentive conditions.

Defects in factor and product markets reduce the level of produc-
tion and demand for agricultural commodities. Marketing services
should be designed to stimulate agricultural production and demand.
thereby influencing the volume and mix of farm output. Cooperatives and a reorientation of the Consejo policies to make possible the achievement of these objectives seems to be the solution. As long as cooperatives are developed and prove to be working satisfactorily, the Consejo should retreat from these areas and activities and redirect its effort to areas and activities in which its presence is more useful.

Lack of knowledge of alternative investment opportunities calls for the participation of government, cooperatives, private enterprise, etc. The basic Costa Rican institutional arrangement for these purposes is already established. A reorganization of their activities in order to make more dynamic the dissemination of information and research programs seems to be the most adequate remedial measure to overcome this structural defect. The Plan set as a variable target the reorganization and improvement of the system. In this sense such modification should be regarded as a success element. It would require, however, constant research - and evaluation of the results arising from its implementation - about physical and institutional possibilities and limits so as to facilitate the exchange of information about inefficiencies in agriculture engendered by defects in agrarian structures. Formal education at all levels is a prerequisite for understanding the advantages of the use of new factors and the consequent adoption of the most efficient input mix. It has to be complemented by well designed extension service schemes, experimental stations, participation of agricultural cooperatives, etc.

The compensation method adopted in the land expropriation stage can be either instrumental in achieving development in non-agricultural
industries or a heavy monetary burden for the government, a waste of
monetary funds given they are allocated in non-productive activities,
and a threat to the monetary stability of the country. The country
should attempt to channel payments by concept of land expropriation into
productive activities. The Peruvian experience can be of great experi-
ence in designing such a scheme.

4. The hypotheses that have been used in this study to direct and
control the inquiry have been developed at a conceptual level.
Empirical verification of them was not performed since 1) it would
compare the pre-Law situation with conditions that would arise after the
application of the structural changes suggested in this work, 2) present
data is meager, and 3) data, when available, is not completely reliable.

The three reasons cited above place a restriction for the future
test of these hypotheses. For example, in the future we may have
available the necessary information for the empirical verification of
them but not for the past. At any rate, these restrictions should not
deter us to begin research and the collecting of data suitable for the
future test of these hypotheses or any other related aspect regarded as
important. Thus income per capita productivity checks can be made by
specific areas and products in order to determine direction and magni-
tude of change of this variable. Since the magnitude of this variable
and its changes are the result of adjustments in economic, social and
political institutions, a multiple regression analysis may be appro-
priate to show us how the variables in which we are interested in have
been affected by these adjustments through time. In fact, through this
statistical procedure, t tests can be performed to measure experienced
changes in elasticities of production for the factors used in the production function for two or more discrete points in time.

A test of differences for the elasticities of production of a given factor in these two different points would reveal to us which variables have undergone significant changes between the two periods. A similar procedure applied to ownership and tenancy will permit us to discover the magnitude of the elasticities of production for factors under different farming systems. Furthermore, an approximation to marginal value product for different resources can be obtained from the production functions and, given factor and product prices are known, an evaluation of the actual resource combinations relative to the optimum combination can be performed. Data to carry out such tests would depend on the level of sophistication pursued. Thus, for instance, data on crop land, crop labor, crop machine services and cash expenses might be some of the variables to consider. One aspect that may be interesting to investigate and which is relevant for farm size policy considerations is the form of the average cost curve for farms. If farms use similar production functions, the investigation may be directed to the analysis of farms of different size. This would give us an idea of the optimum farm size for specific crops through the identification of the minimum average cost. Similar research can be made to test other hypotheses such as comparing the resource opportunity cost in different areas and for different products (e.g. labor). This might be a factor to consider in the programming of settlement projects. Research to perform such tests is, however, the first step. It would include existent market structures, factor and product prices, soil types, development,
evaluation and improvements in the institutional setting, etc.

The Costa Rican agrarian reform law is the first comprehensive effort of the country toward the achievement of agricultural development, to reaffirm the traditional political stability of the country and as a means to achieve a more accelerated social progress in the nation. However, a program of agrarian reform, if it is aimed to achieve developmental goals, needs a constant evaluation of actual results in order to expand success elements and to correct failure elements. The implementation of agrarian reform measures and their adequacy for the solution of the problems they are designed to solve are also relevant. If the implementation stage is slow, it might bring despair to rural people who would be tempted to take short cuts and drastic measures. If the implementation stage runs smoothly, but the solutions are inadequate, the problem will still remain. The real solution will come through sound economic policies, well-developed programs and the implementation of the necessary structural changes in agriculture. Hopefully, this study is a step in this direction.
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