CHAPTER I

INTRODUCTION

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1.1 Scope of the Study

The present study intends to meet the need of a feasible plan for developing the hinterland of the ports at Caldera and Puntarenas in an integrated way. For this purpose, assessment is made both of the socio-economic conditions of the hinterland and of the contributions expected to be made by the new port to the hinterland, the adjacent region and national development. Regional resource endowments and locational characteristics are examined; possible lines of developmental activities in both public and private spheres of high priority projects in both long- and short-term perspectives are identified. Strategies for industrial, urban, agricultural and tourist development are formulated and environmental requisites in their developments have been enumerated.

In order to identify potential areas of the economic and social development of the hinterland, (which is defined in the following section), some historical analyses are also made sector by sector. These historical facts are combined with future projections and plans on the basis of available information for the entire country, provided by the Government of Costa Rica and by some researchers.

Consequently, the present study is made as consistently as possible with the perspective of the future national development as a whole.

1.2 Physical Setting

(1) Identifying the hinterland of the Caldera and Puntarenas ports is not an easy matter. The ports' hinterland is a type of spatial concept. It can stretch conceptually as far as any influence which may extend from the ports. An old definition of the German word, "hinterland," originally is "the land area from and to which the commerce of a port moves." Thus, it is an area or space functionally related to the ports.

This study has taken the view that such an area influenced by the ports can be defined in three geographical phases.

The first is the area called Gran Puntarenas, as defined by the Ingenieros de Centroamerica (INDECA) report in 1975, under the title of "Estudio de Desarrollo Urbano Integral de la Zona Puntarenas - Barranca - Caldera." (See Figure 1.1)

The second includes a wider area encompassing Gran Puntarenas itself and the area immediately adjacent to it. This area could be delineated in various ways. This study, however, is noted for identifying a region known as Pacifico Central in the document entitled, "Proyecciones Regionales de la Población de Costa Rica," that was prepared by the Instituto de Estudios Sociales en Población (IDESPO) and the Oficina de Planificación Nacional y Política Económica (OFIPLAN), (Informe #5, September 1976). This region extends over eight cantons in three provincias as shown below. (See Figure 1.1 and 1.3)

The Pacifico Central Region is somewhat wider than the area of direct influence defined and adopted in the INDECA report.

Province	Canton	District
Puntarenas	Central	Puntarenas, Pitahaya, Chomes, Lepanto, Paquera, Manzanilla, Guacimal, Barranca, Jaco, Monte Verde, Cobano
	Montes de Oro	Miramar, La Union, San Isidro
	Esparta	Esparta, San Juan Grande, Macacona, San Rafael, San Jeronimo
	Parrita	Parrita
	Aquirre	Quepos, Savegre, Naranjito
Alajuela	San Mateo	San Mateo, Desmonte, Jesus Maria
	Orotina	Orotina, Mastate, Hacienca Vieja, Coyolar, La Ceiba
San Jose	Turrubares	San Pablo, San Pedro, San Juan de Mata, San Luis

The region defined, thus, as Pacifico Central has been chosen as the hinterland of the ports. This may not be considered the most appropriate definition, however, because the Pacifico Central was so identified only by the IDESPO and OFIPLAN study, mainly in the context of serving the purpose of population projection. Nevertheless, the region was also adopted similarly in Desarrollo Regional y Urbano in March 1977 by the Oficina de Planificación Nacional y Política Económica, División de Planificación Regional y Urbana. The nomenclature of Pacifico Centro, however, was adopted here.

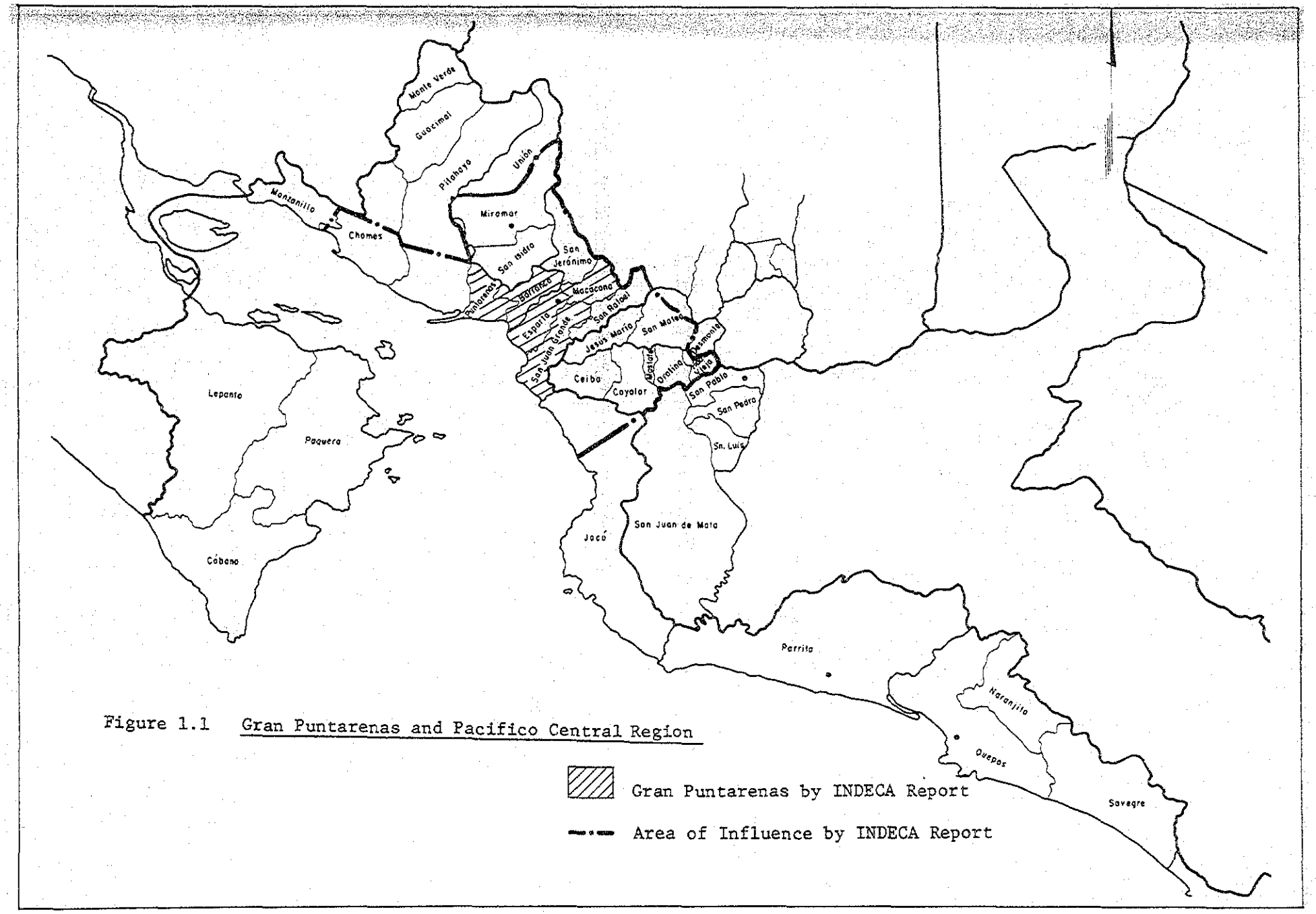
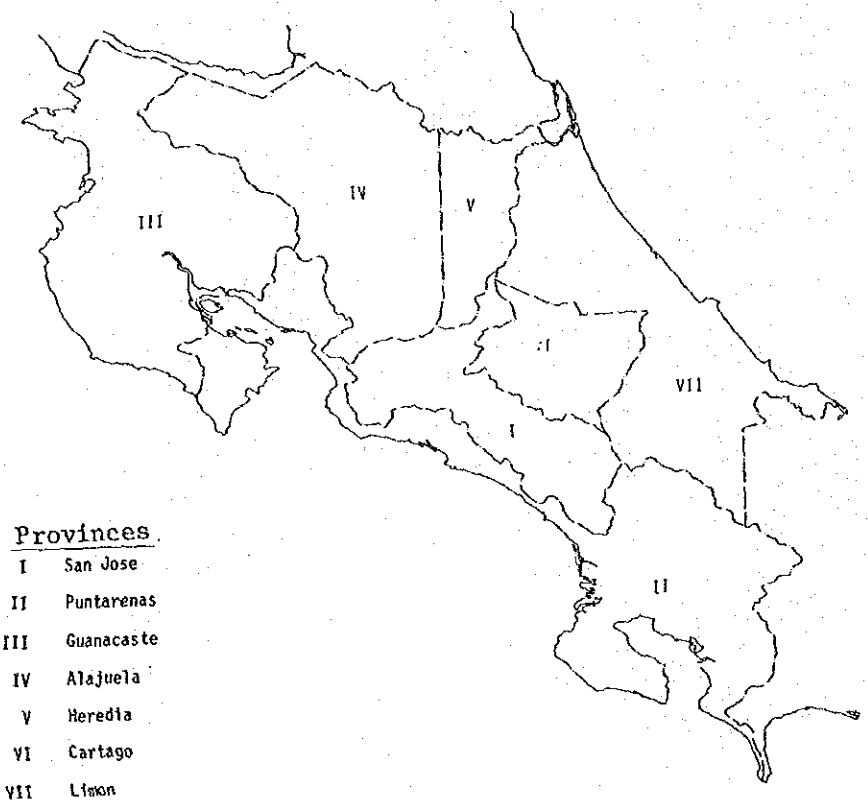


Figure 1.1 Gran Puntarenas and Pacifico Central Region

Gran Puntarenas by INDECA Report

Area of Influence by INDECA Report

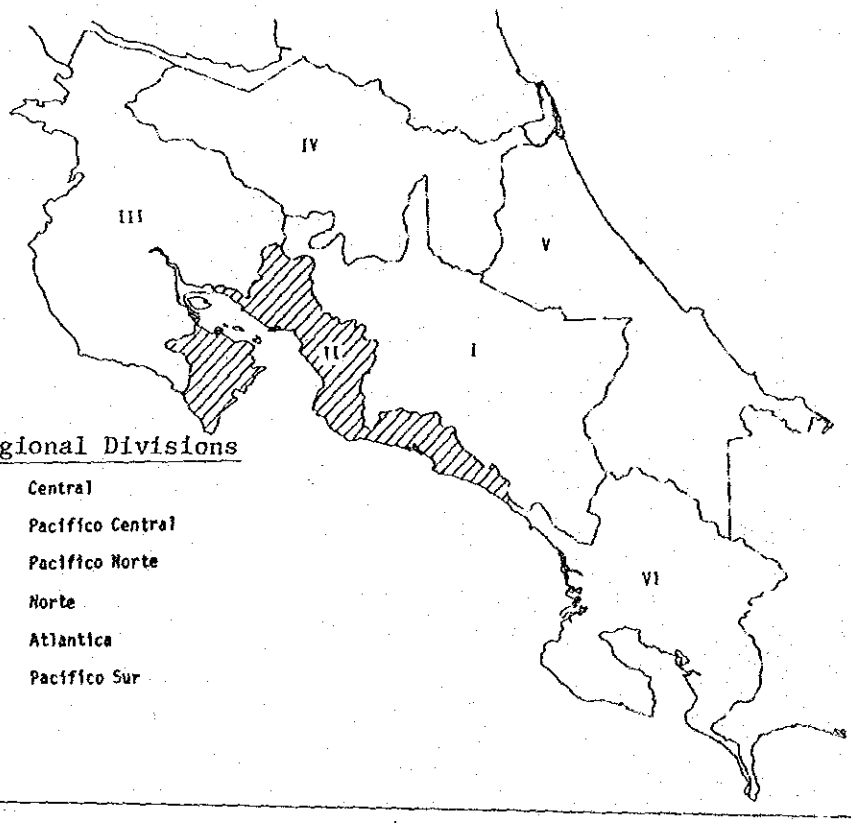


Provinces

I	San Jose
II	Puntarenas
III	Guanacaste
IV	Alajuela
V	Heredia
VI	Cartago
VII	Limon

Figure 1.2 Administrative Division of Costa Rica

Figure 1.3 Regional Divisions for Development Strategies of Costa Rica



Regional Divisions

I	Central
II	Pacifico Central
III	Pacifico Norte
IV	Norte
V	Atlantica
VI	Pacifico Sur

In order to obtain previous basic statistics, this prima facie administrative demarcation of geographical areas is used in adopting the hinterland.

(2) The above two regions, which are identified as the hinterland, may not be self-contained nor have complete autonomy in any sense of either an economic or social context, except for geographical affinity. In fact, this study considers that the economic and social variables of the hinterland region as demarcated above are, in fact, very closely related, at present and possibly even more so in the future, to all other regions in the country. Therefore, any other region, then, is also considered capable of constituting a functional relationship to the hinterland (the third phase), so far as any economic relations are thought to be intimately connected to the hinterland. In this way we can attempt to identify the economic and social influence of the Caldera and Puntarenas ports. To the extent that it is considered necessary, therefore, the whole country can be regarded in the context of developing the hinterland.

Except for the above two regions, the whole country - Meseta Central, Alajuela through Quesada and Guanacaste, including Nicoya Peninsula - has special importance as a hinterland, as referred later.

(3) The Caldera and Puntarenas area is most closely connected with Meseta Central by a highway and a railroad. Those connections will be further strengthened in the future by the new Caldera road.

Secondly, the area around Cañas and Liberia in Guanacaste is easily reached by the Inter-American Highway.

Thirdly, the area around Nicoya and Santa Cruz in Nicoya Peninsula can also be fairly easily approached via ferry boat and road, most of which are presently being paved.

The most difficult area to approach in the hinterland at present is the southern coast. But in the future, by the planned extension of the Pacific Sur route, the southern Pacific coastal area will be developed as an important hinterland.

Road distances from Puntarenas to major cities in the hinterland are shown below:

	km
Esparta	20
San Ramon	58
Quesada	116
San Jose	110
Cartago	132

Cañas	38
Liberia	136
Santa Cruz	192 (via ferry 94)
Nicoya	214 (via ferry 72)
Orotina	45
San Pablo	170 (via Caldera Road 55)
Parrita	222 (via Pacifico Sur 100)
Quepos	247 (via Pacifico Sur 125)

Note: Distances in the right hand column are tentatively given by the Mission.

1.3 On Time Reference

The development strategy for the hinterland of Caldera and Puntarenas Ports, in this study's view, most appropriately should be conceived over a long-term perspective of about 20 years, ending around the year 2000.

This time reference would be a most suitable framework for the following reasons.

First, the Government of Costa Rica has prepared an overall perspective of the country for the year 2000. For this purpose the government has prepared a set of basic data. Some of the data are past projections such as those for population and its distribution among industries. Others are predictions based on certain assumptions which include some implications of policy alternatives. G.D.P. in 2000, for example, is such a figure. The remaining data may be said to be a set of alternative possibilities, such as kinds of industries which might be developed in the future. The government perspective for the year 2000 is not a development plan as such, and it should be followed by increasingly concrete plans, divided by stages, in order to guide the development of the country towards the perspectives and projections of the year 2000.

Any regional development plans, such as the integrated development of the hinterland of Caldera and Puntarenas Ports, should also be considered in the same framework with government projected perspectives of the entire country toward the year 2000. Any regional study should provide increasingly more concrete results relevant to the development process oriented towards projected perspectives of the year 2000. The inter-relationship of regional development in the development context of the entire nation should be shown for a commensurable period of time reference.

Second, any economic and social development process takes time. In particular, a low key, open and democratic country like Costa Rica must take into account a considerable long-term future growth for justification of any new projects which relate to the structural development of the country.

1.4 Impact of the Caldera Port

The port expansion at Caldera is characterized by the following two factors.

First, the Caldera port facilities are substantially a part of the expansion of the old port at Puntarenas, such as the new pier for sugar loading in Punta Morales. The existing two berths for foreign trade vessels in Puntarenas Port are now going to be expanded to five berths for the same purpose.

The capacity for handling cargo at the old pier of Puntarenas Peninsula has been only five hundred thousand tons annually. Thus, vessels are always waiting almost continuously for berth and can be found moored near the port. Port activity, therefore, has reached its peak. It can be expanded by opening three new quay walls in Caldera Port.

Second, quick dispatch of loading and unloading cargoes can start by opening well designed wharfs, which contain cargo handling cranes, a wide apron, sufficient space for a transit shed and a warehouse with an open yard, and an efficient approach system by road and railroad. These will contribute enormously to save time and costs of handling cargo at a port with a sufficient capacity of berths.

These two factors of improvement in port activities will immensely influence development of the hinterland of the Puntarenas and Caldera ports, as can be seen as follows.

First, the Meseta Central will directly benefit most from the gateway port by an improved transportation system which can channel foreign trade. This is the most immediate benefit because of the present nature of the hinterland. This factor is also reflected in the planning and design of Caldera port, particularly its selection as a port site for foreign trade, but not for waterfront industry.

Through the improvement of economic activity in the Meseta Central, the whole national economy will benefit by the port improvement at Caldera.

Second, sufficient and efficient facilities in this foreign trade port will gradually contribute to the more adjacent hinterland of Pacifico Central, particularly to Gran Puntarenas. Generally speaking construction of new ports in advance, and not just their expansion, is one of the most important factors leading to regional development, if it is well planned and timely undertaken. Moreover, a good port is

reportedly one of the most important factors for stimulating industrial locations. The interactions between port construction in advance and regional industrialization is easily seen in most industrially advanced countries.

In the Puntarenas area, FERTICA is an actual example of this relationship, in which the ceiling capacity of the old pier was overcome. In the past, entrepreneurs may occasionally have terminated construction of industrial plants in the nearby area of Puntarenas because of the limited port capacity, but in the future they will certainly be induced to undertake a project simply because of the existence of an improved port. Regional industrialization will further be supported by agricultural development in Pacifico Central, Guanacaste and possibly restricted industrialization in the Meseta Central.

Even if only a few factories dealing with massive cargoes will be established there, easy truck transportation from factory door to wharf must certainly stimulate the future growth of many new plants.

Third, Caldera port will have some impact on agricultural development in combination with other related projects, particularly along the Costanera Sur route, and Guanacaste including Nicoya Peninsula.

In most countries, agricultural development in the hinterland is deeply related to an earlier stage of port development. Contrary to most cases, this relation does not look so attractive in the hinterland of Puntarenas port except for agricultural development in the Meseta Central.

In the future, however, in combination with other related projects like the Costanera Sur Road, possible irrigation construction in Tempisque Valley and agro-industrial parks in Gran Puntarenas, a sufficient capacity of Caldera Port is expected to be an important factor contributing to the agricultural development of the hinterland.

Finally, future prospects for adequate expansion of Caldera port will play an important role in the total development of its hinterland. It is very easy and cost saving to undertake and implement an expansion of Caldera Port, including main wharfs, feeder wharfs for container service and industrial wharfs for private use.

The future expansion should produce extremely different conditions compared with the old pier at Puntarenas, vis-a-vis the three items referred to above.

CHAPTER II

REGIONAL DEVELOPMENT STRATEGIES

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2.1 Needs for Establishing Concepts of Regional Development Planning

Physical, economic, social, cultural and any other kind of development occurs in a time-space continuum. Regional development is a phenomenon of development defined in terms of space. Both the words "region" and "development", however, require further refinement of their meanings in order to make use of them for the purpose of planning an analysis.

A region is a part of the surface of the earth - either narrow or wide - delineated for a given purpose of study.

Development can be interpreted in many ways, but here it is conveniently regarded as creation and/or improvement of physical structures - buildings, roads, bridges and so on - which are settled on land or which spread over spatial extent. From an economic and social point of view, development means the dissolution of underdevelopment and through which betterment of level of living. Underdevelopment is identified also by many symptoms such as shortage of capital, expertise, idle space, low level of per capita income and the like.

The concept of planning must be elaborated too, before referring to regional development planning. Planning is a combination of processes of thinking, doing and seeing of something to achieve. More specifically speaking, planning consists of (1) assessment of available resources, (2) policy formulation, (3) fixing physical targets, (4) allocation of resources among sectors as well as regions and sub-regions, (5) formulation of projects, (6) matching required resources with available resources, (7) implementation of development programs, and (8) reviewing and reporting progress.

Planning must imply the whole of these processes which range from the formulation of plans to the feedback process, which evolved from the outcome of executing plans.

2.2 Prerequisites for Development Planning

The following considerations are called for, prior to drawing up any plans.

(a) The identification of social needs should be made on the basis of resorting to adequate data concerning the matter.

(b) Technical-physical possibilities of performing a given plan should be searched through collecting all information and knowledge about it.

(c) The economic feasibility of implementation of the plans should be confirmed by evaluating economic consequences of development activities.

In addition to the above mentioned prerequisites for development planning, regional development planning requires a further vital factor to be considered, that is, delimitation and classification of regions which vary for different purposes of planning.

Regional problems, to be solved by planning are subject per se to change according to the ways that regions are delimited. For instance, a certain small region, being annoyed with shortage of water resources, might be rescued, in some case, by accommodating the supply of water on the basis of larger area.

The concept of regional planning will be clarified by contrasting it with other planning concepts.

National Planning

This should comprise regional planning as a part of itself in harmony with it.

Sectoral Planning

This is based on a sector-by-sector approach without paying serious attention to the spacial aspect of development.

Local Planning

Any locality or division of land with administrative capacity would undertake something similar to planning the betterment of the local situation, but not necessarily geared harmoniously to the plans of other places of national planning.

In contrast to local planning that purports to improve a specified area only, regional planning that accounts for the harmonious relationship with the rest of the country is often called "regionalism." In the context of some schools of thought, localism is used to denote an antonym of regionalism. Nevertheless, regionalism is thought, in this sense, to be a way of thinking towards better coordination between developmental factors and conflicting interests in a given region.

The determination of an area for regional planning depends upon the nature of the tasks to be done, which themselves constitute the raison d'etre of the plan. In the determination of an area, consequently, it is essential that the area be studied in its entirety. An area is an environmental entity, with homogeneity and interrelating parts; hence it should be examined in a comprehensive perspective on the basis of regional sections of the country, jurisdiction, land conditions, and spheres of industrial zones, livelihood, beneficiaries and influences in a manner most suitable for the assigned tasks.

The points to which attention ought to be paid in this instance are: (1) that the area should encompass the districts which are confronting common issues, (2) that it should include the districts which are related to the implementation of the most important measures and (3) that it should contain the districts to which the major effects will extend or the districts in which the influences will have to be adjusted. While giving heed to these points, consideration must also be given to the need to divide the area into divisions of such proportions as will facilitate the planning and implementation of the actual measures determined.

To a great extent, the way in which the program period is determined holds sway over the substance of a regional development program. In some instances, the program period or the target year is predetermined, as when it is tied in with that of a higher level program (e.g., a national development program). Then there are cases in which the plan period or the target year must be determined independently and optionally on the basis of the substance of the plan. There is no generally accepted theory as to how many years should be set aside for a planned period. Judging from the viewpoint of planning technique, it may be appropriate to set it within a period in which the reliability of forecasts may be assured to some extent, or a period in which no basic alterations are considered likely to take place in the targets of the regional plan.

Whether the planned period is long or short is determined by the substance and the degree of precision of a plan. Long-range plans would reach down to projects with gestation periods of three to five years. In substance, the long-range plan is abstract whereas the short-term plan is concrete. In the construction of a mammoth dam, however, concreteness pervades even in the long-range plan. The following are the various types of plans classified by planned periods.

Table 2.1 Planned Period as Classified by Types of Plans

Period	Classification	Type
More than 20 years	Ultra-long-range plan	Vision, pilot plan
10 - 20 years	Long-range plan	Master Plan
5 - 10 years	Interim plan	Plan Program
3 - 5 years	Short-term plan	Project

As a plan gradually takes on concrete shape, beginning with the pilot plan and advancing to a basic plan, then to a plan and finally to a project, whatever is incorporated in the plan worked out on the higher level (for a wide area) is progressively subdivided into projects on the lower level (for limited areas). The minuteness of the plan must be stepped up in proportion to this subdivision. As a yardstick for the minuteness of planning, a list of scales for maps for different types of planning is given below. It is to be noted that this list serves as a general criterion, and it does not necessarily mean that this list may serve as it is in actual planning. The scales should be more elaborate in some cases and could be rougher in others.

Table 2.2 Types and Minuteness of Plan (Scales of Maps for Use in Physical Plans)

	National land plans	Regional plans			Local plans	
		Local	Prefecture, etc.	Wide-area city, etc.	Urban	Housing project, etc.
Pilot plan	1/2,000,000	1/1,000,000	1/200,000	1/50,000	1/15,000	1/10,000
Master plan	1/1,000,000	1/500,000	1/100,000	1/25,000	1/10,000	1/3,000
Plan	1/500,000	1/200,000	1/50,000	1/10,000	1/3,000	1/1,000
Project	-	-	-	-	1/600	1/600

With respect to the relationships among the various types of plans in the table, it might be said that the nature and minuteness equivalent to those of a pilot plan at a city level are required for a master plan (1/25,000) at a wide-area city level, and that the nature and minuteness equivalent to those of a plan at a local level is required for a pilot plan (1/200,000) at a prefectural level.

When a regional plan is defined as a plan related to a given region or area, it is clear at least from the above classification that regional plans come in various types. What plan should be made the guideline for conduct in the immediate future depends upon the given case, and therefore no sweeping conclusion can be made. In any event, it is anticipated that a regional plan will provide the prescriptions which are to be required in finding solutions to the problems of a given area. Given this anticipation, it is only natural that one target or another ought to be established. Again, the target comes in various patterns. The various targets are related to one another in the form of a hierarchy. Whatever target is set on the lower level serves as a means to accomplish a target set on the higher level. From the standpoint of character building, for instance, education may be looked upon as an expedient. From the viewpoint of education, however, the school system is a resource.

In a similar vein, the targets in a wide-area program are also multiple. When the targets are classified in the order of conceptual, qualitative targets and concrete, quantitative targets, they fall into three categories of 1) Qualitative Objectives (character of a given area in the future), 2) Policy Objectives (basic measures) and 3) Quantitative Objectives (economic, social, physical, etc.) The targets in these three categories are listed below:

(a) Qualitative Objectives

1) Scale : Large, medium, small, etc.
2) Industry : Primary, secondary, tertiary, specialization and combination of industries, etc.
3) Function : Administrative, control, production, consumption, welfare, transport, military, etc.
4) Level : International, national, local, district.
5) Form : Cities, farm and fishing villages, etc.
6) Standards : Income, livelihood, culture, etc.
7) Others : Peculiarities based on geographic conditions (coastal, inland, unique meteorological conditions, etc.)

(b) Policy Objectives

1) Resources development
2) Industrial development
3) Urban development
4) Rural development
5) Facilities development (development of major facilities altering geographic or site conditions)
6) Livelihood improvement (redevelopment of living environment)
7) Culture promotion (redevelopment of cultural and educational facilities)
8) Replenishment of welfare and health
9) Protective maintenance
10) Others (military and other special matters)

(c) Quantitative Objectives

1) Population composition (total population, population composition by industries, family composition, etc.)
2) Economic structure (industry, distribution, finance and banking, etc.)
3) Area structure (spatial distribution of population, industry, functions, etc.)
4) Land use pattern
5) Urban pattern (single, combined, wide-area, etc.)
6) Rural pattern (villages, hamlets, land redevelopment plot, etc.)
7) Facilities (systems facilities such as transport, water supply, drainage, communication, electric power, gas; facilities provided for educational, cultural, and welfare uses; fixed facilities for land conservation, disaster prevention, protection and use of cultural assets)
8) Others (environment, etc.)

The quantitative objectives provide quantitative indicators for various factors necessary for the realization of the qualitative and policy objectives of an area. It does not necessarily mean, however, that the qualitative, policy and quantitative objectives are clearly indicated in written plans, but it is conceivable that such a classification in the mental planning process would be able to clearly shape images of the future.

2.3 Methods of Matching Locational Factors with Requirements by Various Projects

Regional characteristics, if properly listed, represent only the conditions of the surroundings in which some projects in question are performed. Development requires combinations of locational factors at the site or spot where development is taking place.

The Table 2.3 shows an sample check list of locational factors with regard to types of industrial activities.

Table 2.3 Required Locational Factors with Regard to Types of Industrial Activity

Locational Factors \ Type of Industry	1	2	3	.....	Total
Land					
Water					
Transport Facilities					
Energy Supply					
Labor of Adequate Quality					
Disposal of Wastes					
Others					

This kind of check list of factor endowments could be converted into a system or matrix of constraints employed in mathematical programming of the optimization of resource allocation. Matrix presentation of such an approach is as follows:

Maximized: $(V)\ \{X\} = (Y)$

Subject to constraints

$[A]\ \{X\} \leq \{R\} \qquad X \geqq 0$

where (V) is the vector of the coefficient of income earnings per output.
{X} is the vector of outputs of each industry.
(Y) is the vector of the value of income per output.
[A] is the matrix of technical coefficients or input requirements per output.
{R} is the vector of the available amount of resources at the project location.

2.4 The Concept of Human Settlement

Human settlement has become a popularized phrase especially after the U.N. Conference on Human Settlement and Habitat held in Montreal, Canada, in 1976. Human settlement could be interpreted in many ways. Apart from any of the previously proposed definitions, we should like herewith to suggest such an interpretation that human settlement is composed of three major factors: provision of (1) job opportunity, (2) accommodations or shelters and (3) social facilities such as roads, schools, sewers and the like.

If town planning were conceived to be a kind of human settlement planning, the total development would comprise the costs of housing, investment in plant and equipment, and public facility investment.

Areas already developed have usually advantages of agglomeration and merits of scale in the supply of various goods and services. Therefore, creation of new town projects should be compared with the renewal and expansion of already developed areas in terms of social costs.

In this connection, workers-to-the-work policy, which promotes migration to the locality of employment, should be compared with the work-to-the-workers policy, which promotes shifting the work to the locality of the workers. Both types of policies should be applied alternately depending on the situations, facing the comparison of costs between migration and relocation of job opportunities or place of work.

2.5 An Outlook on Regional Development Aspects of Costa Rica

In order to justify a policy measure for giving special emphasis or favor to a certain region, the role and significance of the region in national development should be identified against the other regions within the country. Table 2.4 illustrates characteristics singled out for a given region in the background of the national inventory of various endowments.

Thus, regional characteristics - regionality or factors singled out - should be matched with factors required to realize potential growth envisaged by national planning. Types and amounts of the required regional factors are, of course, dependent upon types of industry and economic activity.

The growth potentials of each region could not be appraised rightfully before matching the requirements with the region's factor endowments.

Population movements among regions, apart from the natural increase of population, are considered an indication of the differences in realized potential growth or in regional achievements. The Pacifico Central, as defined by OFIPLAN, is the area of the study and includes Gran Puntarenas and its hinterland. It showed little absorptive capacity for migrants in the past decade and, therefore, is anticipated to have no more migrants coming in, but a considerable number of out-migrants, while other regions, as defined by OFIPLAN, such as the Valle Central, the Atlantic and the Pacific Sur, are expected to attract many migrants by A.D. 2000 (See Table 2.5).

From the point of view of spot development like town planning, data and projections on the tendency of regions, categorized at an upper level such as a province, are not adequate to formulate development strategies. More data and observation at lower levels and on a minute scale are needed to work out practical plans.

Table 2.4 NATURAL, SOCIAL AND ECONOMIC CHARACTERISTICS BY REGION IN COSTA RICA

NATURAL CONDITIONS	REGION PACIFICO CENTRAL	REGION PACIFICO NORTE	REGION PACIFICO SUR	REGION NORTE	REGION CENTRAL	REGION ATLANTICA
A. CLIMATE						
1. Average Temperature (°C) 1/	25.7	27.1	N.A.	N.A.	19.0	23.3
- January	27.3	27.8	N.A.	N.A.	20.9	25.5
- July	2,100	1,300	3,400	2,500	1,500	4,600
2. Average Rainfall 1/ (mm)						
B. POTENTIAL LAND USE (Km^2) 2/						
1. Intensive Annual Crop Farming	562	1,080	738	897	1,602	1,076
2. Extensive Annual Crop Farming	223	1,048	536	-	177	606
3. Intensive Permanent Crops or Pastures	-	652	424	1,459	418	468
4. Extensive Permanent Crops or Pastures	1,163	3,088	1,463	3,363	205	397
5. Forestry Only	2,014	2,569	3,331	2,139	2,956	2,414
6. Subject to Continuous Flooding	340	582	480	816	-	1,300
7. Protection Areas (Heavily Sloped)	285	1,632	2,777	326	2,288	3,465
TOTAL	4,587	10,651	9,749	9,000	7,646	9,726
C. PRESENT LAND USE (1973) 3/ (Km^2)						
1. Annual Crops	342	744	859	321	352	212
2. Permanent Crops	154	76	331	173	893	443
3. Pastures	2,421	5,944	1,843	2,345	231	720
4. Forests	395	1,209	1,466	2,163	888	1,043
5. Fallow Land	265	740	639	526	357	310
6. Other Lands	61	373	91	77	80	55
D. SOCIAL CONDITIONS						
1. Population (1973)	127,167	178,691	174,287	94,454	1,174,802	122,379
2. Population Density per Km^2	27.7	16.8	17.9	10.5	153.6	12.6
3. Population per Km^2 of Potential Crop Land	65.3	30.5	55.1	16.5	489.1	48.0
4. Economically Active Population	37,651	50,375	49,959	28,058	378,826	40,444
5. E.A.P. by Activity:						
- Primary Sector 4/	18,347	29,562	35,210	19,774	87,059	28,274
- Secondary Sector 5/	5,548	5,760	3,292	2,158	95,811	3,514
- Tertiary Sector 6/	11,841	12,078	9,214	4,960	175,857	11,335
6. E.A.P./Total Population	0.296	0.282	0.286	0.297	0.322	0.33
7. Level of Education 7/						
- % with primary education	70	72	73	70	68	71
- % with secondary education	9	8	6	5	17	10
- % with higher education	1	2	1	1	5	1
- % with no schooling	21	18	20	23	11	18

(cont'd)

NATURAL CONDITIONS	REGION PACIFICO CENTRAL	REGION PACIFICO NORTE	REGION PACIFICO SUR	REGION NORTE	REGION CENTRAL	REGION ATLANTICA
E. ECONOMIC CONDITIONS						
1. Public Investment (Million Colons)	46.2	335.0	23.2	50.9	472.0	119.0
(1975-1976 Average) 8/	(2.6%)	(19.1%)	(1.3%)	(2.9%)	(27.0%)	(6.8%)
2. Agricultural Credit (Million Colons)	221.5 9/	414.0	201.2	149.9	621.5	42.1
(1973-1975 Average)	(13.4%)	(25.0%)	(12.1%)	(9.0%)	(39.6%)	(2.5%)
3. Gross Income Declared for Income Tax Purposes	437.5	424.4	266.3	161.0	11,770.3	619.5
(Million Colons, 1972) 10/	(3.1%)	(3.1%)	(1.9%)	(1.1%)	(86.0%)	(4.5%)
- Corporations	270.2	237.5	113.6	85.5	9,330.8	503.4
- Individually Owned Business	134.3	161.8	103.9	66.5	1,325.1	82.4
- Employees	33.0	25.1	48.8	9.0	975.4	33.7
4. Electricity Consumption 11/						
- % of Residential Use	3	2	1	1	90	3
- % of Other Uses (industrial, etc.)	9	3	1	1	83	3
- % of Home with electricity	40	30	13	30	82	27
5. Transport Network 11/						
- Meters of Paved Roads per Km^2	18	27	9	3	123	1
- Meters of All Weather (Unpaved) Roads per Km^2	83	64	79	44	231	32
- Meters of Dry Weather Roads per Km^2	149	157	47	62	280	21
6. Telephones per 1,000 Inhabitants 11/	14	12	5	7	70	12
7. Homes with Piped Water (%) 11/	65	47	49	38	94	57

1/ Anuario Estadístico 1972, Dirección General de Estadística y Censos.
2/ OFIPLAN, "Uso Potencial del Suelo por Regiones y Tipo de Suelos".
3/ Dirección General de Estadística y Censos, Censo Agrícola 1973.
4/ Includes: Agriculture, Forestry and Fishing Activities.
5/ Includes: Manufacturing, Electricity, Water and Construction Activities.
6/ Includes: Commerce, Restaurants, Hotels, Transport, Storage. Finance, Insurance, Education, Health, and Other Activities.
7/ Population 6 years of age and above. Dirección General de Estadística y Censos, 1973 Population Census, Volume 1, Table 8.
8/ OFIPLAN. The total of ₡1,748 million includes ₡701 million (40%) which cannot be divided between regions because of insufficient information.
9/ Only 1975, no data available for 1973 and 1974; Ministerio Agricultura y Ganadería, Boletín Estadístico Agropecuario, 1973-1975.
10/ Ministerio de Hacienda, Estadística Demográfica Fiscal del Impuesto sobre la Renta: Período 1972, Julio de 1976.
11/ OFIPLAN-INVU-ICE-SNAA, "Diagnóstico de Infraestructura: 1973", unpublished, 1976.

Table 2.5 Projection of Regional Population

		1963	1973	2000	Increments from 1973 to 2000
1. Valle Central	[A]	839,379	1,175,922	1,925,439	749,517
	[B]		(62.78)	1,803,713	(55.68)
[A] - [B]				(+) 121,725	
2. Pacifico Central	[A]	107,302	127,167	133,725	6,558
	[B]		(6.79)	236,536	(0.49)
[A] - [B]				(-) 102,811	
3. Pacifico Norte	[A]	142,554	178,691	211,022	32,331
	[B]		(9.54)	330,570	(2.40)
[A] - [B]				(-) 211,022	
4. Llanuras del Norte	[A]	66,619	94,645	162,819	68,174
	[B]		(5.04)	187,982	(5.06)
[A] - [B]				(+) 20,231	
5. Atlantica	[A]	68,854	122,279	418,707	296,428
	[B]		(6.53)	231,523	(22.02)
[A] - [B]				(+) 187,184	
6. Pacifico Sur	[A]	112,492	174,287	367,344	193,057
	[B]		(9.52)	354,222	(14.34)
[A] - [B]				(+) 13,122	
Total [A]		1,337,200	1,872,991	3,219,056	1,346,065
			(100.00)		(100.00)

Notes: [A] Estimates of population with migration.

[B] Estimates of population without migration.

( ) denotes percentage distribution of incremental population among regions.

Based on "Proyecciones Regionales de la Poblacion de Costa Rica" by Carlos C. Raabe, 1976.

2.6 Regional Characteristics of the Hinterland

2.6.1 Spatial Relationship with the Metropolitan Area

From our observation, the need for developing the hinterland of Puntarenas and Caldera Ports, centering on Gran Puntarenas, arises from the spatial tention between the initiation of construction of the port and the metropolitan area of San Jose, whereby the latter is burdened by the over-concentration of population and industries. At the same time, San Jose is in a position to receive possibly the direct benefit of transport services that are created upon the completion of the enlarged and improved ports. Furthermore, the social, economic and cultural interaction or communication between the metropolitan region and the area of the port will be enhanced. This will lead to enhancing the need to strengthen the transport route between the two regions. Those interactions would result, sooner or later, in migration not only between the port region and the metropolitan region but also between the port and the rest of the country. Migration is considered to be both a cause and result of the shift in the regional growth. It is a complex phenomenon resulting from the interaction among various factors and forces.

2.6.2 Past Population Trends of Gran Puntarenas

Gran Puntarenas, which is directly influenced by a zone consisting of the five districts of Puntarenas, Barranca, Esparta, San Juan Grande and Macacona, may be considered a stagnant area in terms of population movements, inclusive of natural and social changes. While the Barranca District is disregarded because data on this district as of 1963 is not presently available, changes in the population of Gran Puntarenas from 1963 through 1973, indicate that the annual rate of population increase has been as low as 1.1 percent (11.1 percent increase during ten years) compared with 3.4 percent (40.1 percent increase during the same period) annual increase for the nation. Among the four districts excluding Barranca, Macacona ranks highest at an annual rate of increase of 6.7 percent (90.5 percent increase during ten years); Esparta has an annual increase of 3.1 percent or slightly below the 3.4 percent national average during the same period; San Juan Grande has 1.5 percent; and Puntarenas showed the lowest recorded growth of 0.3 percent. It is assumed that the Puntarenas District became overpopulated, while Barranca might have absorbed the spill-over population from old Puntarenas because it is adjoined to the overpopulated Puntarenas area and offers job opportunities in port transportation and related industries. (See Table 2.6 Changes of Population, 1963 - 1973, in Gran Puntarenas.)

2.6.3 Employment and Population by Industry for Gran Puntarenas

In view of past population trends in Gran Puntarenas, and more macroscopically in Pacifico Central as a whole, this region tends to loose its relative weight in the sphere of a nation-wide population upswing expected in the coming decades. Factors affecting population movements are not so simple but complex - for example, natural endowments,

accumulated man-made properties and various kinds of services rendered through advantages of agglomeration. As far as economic factors are concerned, industrial composition and comparative productivity are considered to be major factors in determining the spatial distribution of population associated with employment.

Table 2.7 shows industrial composition expressed by the percentage of the employed by industry in Gran Puntarenas and its five component districts in contrast to the national total. Specialization by industry is measured by locational quotients which are obtained by dividing the region's distributional percentage of the employed by that percentage for the nation; the value of a quotient greater than unity indicates specialization above the national average (See Table 2.8). As compared with the national average, Gran Puntarenas specializes in the non-agricultural sector, including towards manufacturing, commercial activity and transportation industries, as shown by the 0.37 locational quotient for agriculture and 1.43, 1.45 and 2.81, respectively, for the above mentioned non-agricultural industries. Within the region, the Puntarenas District ranks lowest in the agricultural sector, whereas San Juan Grande and Macacona are highly agricultural. Esparta and Barranca are characterized by a relatively high degree of manufacturing and commercial activity. The industrial landscape or scenery of each district, however, may be slightly different from the picture of industrial composition stated hitherto, because the spatial distribution of inhabitants employed in each industrial category does not always coincide with that of industrial plants and factories. In other words, it often happens that the residence of a laborer and the location of his factory lie in different administrative districts or localities; if this is the case, transboundary commuting takes place.

Table 2.6 Changes of Population between 1963 and 1973

- Gran Puntarenas Area -

	1963	1973	Change (%)
Puntarenas	26,082	26,940	3.3 (0.3)*
Barranca	N.A **	5,883	N.A **
Esparta	4,895	6,686	36.6 (3.1)
San Juan Grande	1,260	1,465	16.3 (1.5)
Macacona	1,210	2,305	90.5 (6.7)
Total excl. Barranca	33,447	37,396	11.8 (1.1)
incl. Barranca		43,219	
Costa Rica Total			40.1 (3.4)
Puntarenas Province			21.6 (2.0)

Note: * ( ) denotes annual rate of increase in population.

** In 1963, the administrative division "Barranca District" was not included in the Gran Putarenas Area.

Table 2.7 Population Employed by Industry

- Gran Puntarenas, 1973 -

Sub-district	Numbers	Industrial Sectors *									
		1	2	3	4	5	6	7	8	9	10
Puntarenas	9,261	830	1	1,533	79	665	1,695	1,360	470	2,049	579
(%)		(8.9)	(-)	(16.6)	(0.8)	(7.2)	(18.3)	(14.7)	(5.1)	(22.1)	(6.3)
Barranca	1,791	196	3	375	26	154	278	196	73	368	122
(%)		(10.9)	(0.2)	(20.9)	(1.5)	(8.6)	(15.5)	(10.9)	(4.0)	(20.5)	(6.8)
Esparta	1,915	279	11	394	10	139	341	119	29	467	108
(%)		(14.5)	(0.6)	(20.6)	(0.5)	(7.3)	(17.8)	(6.2)	(1.5)	(24.4)	(5.6)
San Juan Grande	431	251	31	31	-	33	18	13	-	24	30
(%)		(58.2)	(7.2)	(7.2)	(-)	(7.7)	(4.2)	(3.0)	(-)	(5.6)	(6.9)
Macacona	635	308	3	54	3	74	70	12	3	80	28
(%)		(48.5)	(0.5)	(0.8)	(0.5)	(11.7)	(11.0)	(1.9)	(0.5)	(12.6)	(4.4)
Gran Puntarenas	14,033	1,864	49	2,381	118	1,065	2,403	1,700	575	2,988	867
Composition (%)	(100.0)	(13.3)	(0.4)	(17.0)	(0.8)	(7.6)	(17.1)	(12.1)	(4.1)	(21.3)	(6.2)

Note: * As for industrial sectors from 1 - 0, refer Table 2.8.

** Numbers in ( ) indicate percentage.

Table 2.8 Locational Quotients, 1973

	Costa Rica	Gran Puntarenas		Puntarenas		Barranca		Esparta		San Juan Grande		Macacona	
	A	B	C	B	C	B	C	B	C	B	C	B	C
1. Agriculture, etc.	36.4	13.4	0.37	8.9	0.24	10.9	0.30	14.5	0.40	58.2	1.60	48.5	1.33
2. Mining, etc.	0.3	0.4	1.33	-	-	0.2	0.66	0.6	2.00	7.2	24.0	0.5	1.66
3. Manufacturing	11.9	17.0	1.43	16.6	1.39	20.9	1.76	20.6	1.75	7.2	0.60	0.8	0.07
4. Electricity, etc.	0.9	0.8	0.89	0.8	0.89	1.5	1.67	0.5	0.56	-	-	0.5	0.56
5. Construction	6.7	7.6	1.13	7.2	1.07	8.6	1.28	7.3	1.09	7.7	1.15	11.7	1.75
6. Commerce, etc.	11.6	17.1	1.45	18.3	1.58	15.5	-	17.8	1.34	4.2	0.36	11.0	0.95
7. Transport	4.3	12.1	2.81	14.7	3.42	10.9	2.53	6.2	1.44	3.0	0.69	1.9	0.44
8. Finance, etc.	2.3	4.1	1.78	5.1	2.22	4.0	1.74	1.5	0.65	-	-	0.5	0.22
9. Service	20.3	21.3	1.05	22.1	1.09	20.5	1.01	24.4	1.20	5.6	0.38	12.6	0.62
10. Others	5.2	6.2	1.19	6.3	1.21	6.8	1.30	5.6	1.08	6.9	1.33	4.4	0.85

Note: Locational quotient [C] = [B]/[A].

2.7 Tentative Targets

2.7.1 Introduction

In order to determine the scale of the projects which are to be followed in studies of comparative sectors, included in the following chapters, a set of tentative targets in terms of population and GDP is given as a framework for this study. However, this study by no means claims to formulate a definite development plan.

2.7.2 An Approach to the Year 2000

In order to frame the regional economy in the year 2000, the only available for this year provided by OFIPLAN on GDP and Raabe on population are utilized.

Assuming that the disparity in the levels of per capita income between industries in 1976 will continue to the year 2000, the compositional ratios of employment by industry in 2000 are calculated as shown in Table 2.9.

The compositional ratio by industrial category is divided by the corresponding ratio of the employed. As a result, the relative income levels per the employed of each industry are obtained.

The percentage of industrial distribution of GDP in the year 2000 is converted into industrial distribution of the economically active population (EAP) in that year by applying relative income levels. In this process, the disparity of per capita GDP in 1966 implicitly is assumed to persist until the year 2000. In other words, the relative magnitude of the absorptive capacity of each industry persists to the year 2000.

The number of the employed in each industry could be obtained by applying the percentage distribution to the total number of the employed.

Next, changes of the employed in terms of multiple are worked by comparing the base year figures with the corresponding figures in the year 2000. These multiples are converted into an annual compound rate of change, as shown in the last column of the table.

2.7.3 Employment and Population in the Pacifico Central and Gran Puntarenas in the Year 2000

By applying the previously obtained annual rates of change to the Pacifico Central Region, the industrial distribution of EAP is obtained. The total EAP for this region results in 77,507 persons in 2000, which is about seven percent below the figure of 83,585 given by Raabe who obtained this figure on the assumption that there is no migration. The difference between 77,507 and 83,585 in the year 2000

Table 2.9 Estimates of Economic Active Population (EAP) by Industry (Costa Rica Total)

	Number of EAP, 1963	Number of EAP, 1973	Rate of Growth, 73/63 (%)	GDP,1976 Million Colons	GDP,2000 Million Colons	Number of EAP, 2000	Rate of Growth, 2000/1976 (%)
1. Agriculture	188,600	213,226	1.3	3,870	10,866	319,145	1.5
(%)	(49.7)	(36.4)		(19.7)	(12.2)	(24.6)	
2. Manufacturing & Mining	44,300	71,474	4.8	3,990	23,089	220,477	4.3
(%)	(11.7)	(12.2)		(20.3)	(25.9)	(17.0)	
3. Electricity	4,200	5,531	2.8	350	1,292	10,660	2.5
(%)	(1.1)	(0.9)		(1.8)	(1.5)	(0.8)	
4. Construction	20,900	39,078	6.4	990	4,685	96,718	3.4
(%)	(5.5)	(6.7)		(5.0)	(5.3)	(7.4)	
5. Transport	14,000	24,964	5.9	930	3,759	54,339	2.9
(%)	(3.7)	(4.3)		(4.7)	(4.2)	(4.2)	
6. Service	50,250	118,973	9.0	2,600	13,183	322,265	3.8
(%)	(13.2)	(20.3)		(13.2)	(14.8)	(24.8)	
7. Other	57,450	112,067	6.9	6,945	32,134	276,376	3.4
(%)	(15.1)	(19.2)		(35.3)	(36.1)	(21.3)	
Total	379,500	585,313	4.4	19,675	89,013	1,299,980	3.0
(%)	(100.0)	(100.0)		(100.0)	(100.0)	(100.0)	
Total Population	1,336,274	1,871,780				3,377,458	
Percentage of EAP	28.4	31.3				38.5	

Note: ( ) denotes compositional ratios by industry to the total EAP.

could be considered almost equivalent in terms of the annual rate of change; the actual difference only amounts to 0.3 percent. Therefore, the figure 83,585 is adopted in Table 2.10.

By applying the same annual rate of growth of EAP adopted in the case of Pacifico Central, the EAP for Gran Puntarenas in 2000 is obtained and presented in the same table, amounting to 37,060. The participation ratio in Pacifico Central will increase from 29.6 percent to 35.3 percent over the period 1973 to 2000. The same multiple of this ratio is used to obtain the ratio for 2000 in Gran Puntarenas and is 38.6 percent. Using this ratio, the total population of Gran Puntarenas in 2000 is estimated to be 96,000.

As will be explained in Chapter VII, Scenario 2 is not very different from the above result. The absorption of a population amounting to 150,000 in 2000, as presented in Scenario 3, might be attainable through a "big-push" development strategy and intensive public policy.

The above mentioned estimates show the number of employment in the manufacturing sector to be 11,167 in Pacifico Central and 8,100 in Gran Puntarenas in 2000. It seems to be somewhat ambitious to set a tentative target for new industrial employment of about 100,000 in the Gran Puntarenas Region, as analyzed in a later chapter on the basis of piling-up method. Nevertheless, according to these estimates, new employment in manufacturing, as a leading industry, will account for 5,664 persons or 24.6 percent of the total new employment of 23,027 persons. Therefore, it is recognized that a positive differential shift of about 4,000 persons into manufacturing and 13,000 persons into other industries can be calculated both from this set of estimates and from a tentative recommendation, given in a later chapter for new employment in Gran Puntarenas mounting to 10,000 and 30,000 persons, respectively. Such positive differential shift required in attaining the tentative target in manufacturing and other industries could only be realized by additional efforts made for developing Gran Puntarenas. The attainment of these positive shifts may not be so difficult as it first may appear. For example, industrial classification adopted is of a larger category and when more detailed analysis be made on a basis by detailed classification. There should be possible to identify such industries which could be expanded further accommodating possibly more employments. For example, individual industries such as construction and transport possibly may be accelerated in some part during the proportional shifts in view of the imminent opportunity of expected investment for infrastructure, such as the Port of Caldera and the Costarena Sur highway. The average rates of increase, 3.7 and 3.1 percent, respectively, are only slightly above the national average; these rates would probably be realized at about five and four percent, respectively. These accelerated rates of increase would be reflected upon the manufacturing industry, which in turn will affect services and other industries, that act as support factors to push up total economic activity in Gran Puntarenas.

Table 2.10 Estimates of Economic Active Population by Industry (Pacifico Central and Gran Puntarenas)

	Pacifico Central (PC)			Gran Puntarenas (GP)		
	1973 Number	2000 Number	Annual Rate of Growth (%)	1973 Number	2000 Number	Annual Rate of Growth (%)
1. Agriculture	18,347	29,623	1.8	1,882	3,039	1.8
(%)	(48.7)	(35.4)		(13.4)	(8.2)	
2. Manufacturing & Mining	3,358	11,167	4.6	2,436	8,100	4.6
(%)	(9.0)	(13.4)		(17.4)	(21.8)	
3. Electricity	188	393	2.8	118	247	2.8
(%)	(0.5)	(0.5)		(0.8)	(0.7)	
4. Construction	2,002	5,341	3.7	1,065	2,841	3.7
(%)	(5.3)	(6.4)		(7.6)	(7.7)	
5. Transport	2,316	5,291	3.1	1,700	3,885	3.1
(%)	(6.1)	(6.3)		(12.1)	(10.5)	
6. Service	5,159	15,070	4.1	2,988	8,727	4.1
(%)	(13.7)	(18.0)		(21.3)	(23.5)	
7. Other	6,281	16,700	3.7	3,844	10,221	3.7
(%)	(16.7)	(20.0)		(27.4)	(27.6)	
Total EAP	37,651	83,585	3.2	14,033	37,060	3.6
(%)	(100.0)	(100.0)		(100.0)	(100.0)	
Total Population	127,167	236,536	2.3	43,279	96,000	3.0
Percentage of EAP (%)	(29.6)	(35.3)		(32.4)	(38.6)	

CHAPTER III

AGRICULTURAL DEVELOPMENT

CHAPTER III

AGRICULTURAL DEVELOPMENT

3.1 Approaches to the Development of Agriculture in Costa Rica and in the Pacifico Central Region

An integrated development of the hinterland of the ports Caldera and Puntarenas, which is here identified with the Pacifico Central Region, can be conceived in two dimensions, as far as the development of agriculture is concerned.

The first dimension will relate to an analysis of the regional agricultural development in the Pacifico Central Region itself and the second concerns the entire country's agriculture as a resource base for any other activities which would take place in the region and also as a significant portion of the domestic market. This second dimension is relevant because of the various activities related to the development of agro-based and agro-allied industries which will have to be undertaken in the region.

In both dimensions of this development, many common factors are involved because the domestic market is essentially free and competitive. Consequently such parameters as prices of both outputs and inputs of agriculture are relatively commensurable throughout the country. Many other aspects which affect decision making, by public authorities and individual farmers, however, are particular to each dimension.

To begin with, the entire country's agriculture will be examined to identify crucial characteristics of agriculture in the country.

3.2 Characteristics of Agriculture in the Economic Development of Costa Rica

Costa Rica's economy has traditionally depended on agricultural activities, including forestry, hunting and fishery, for about 20 percent of its gross domestic product. However, this percentage has been diminishing over the last 20 years.[1/]

Figure 3.1

Relation between GDP and Agricultural GDP in Current Prices

1961 - 1975, Costa Rica

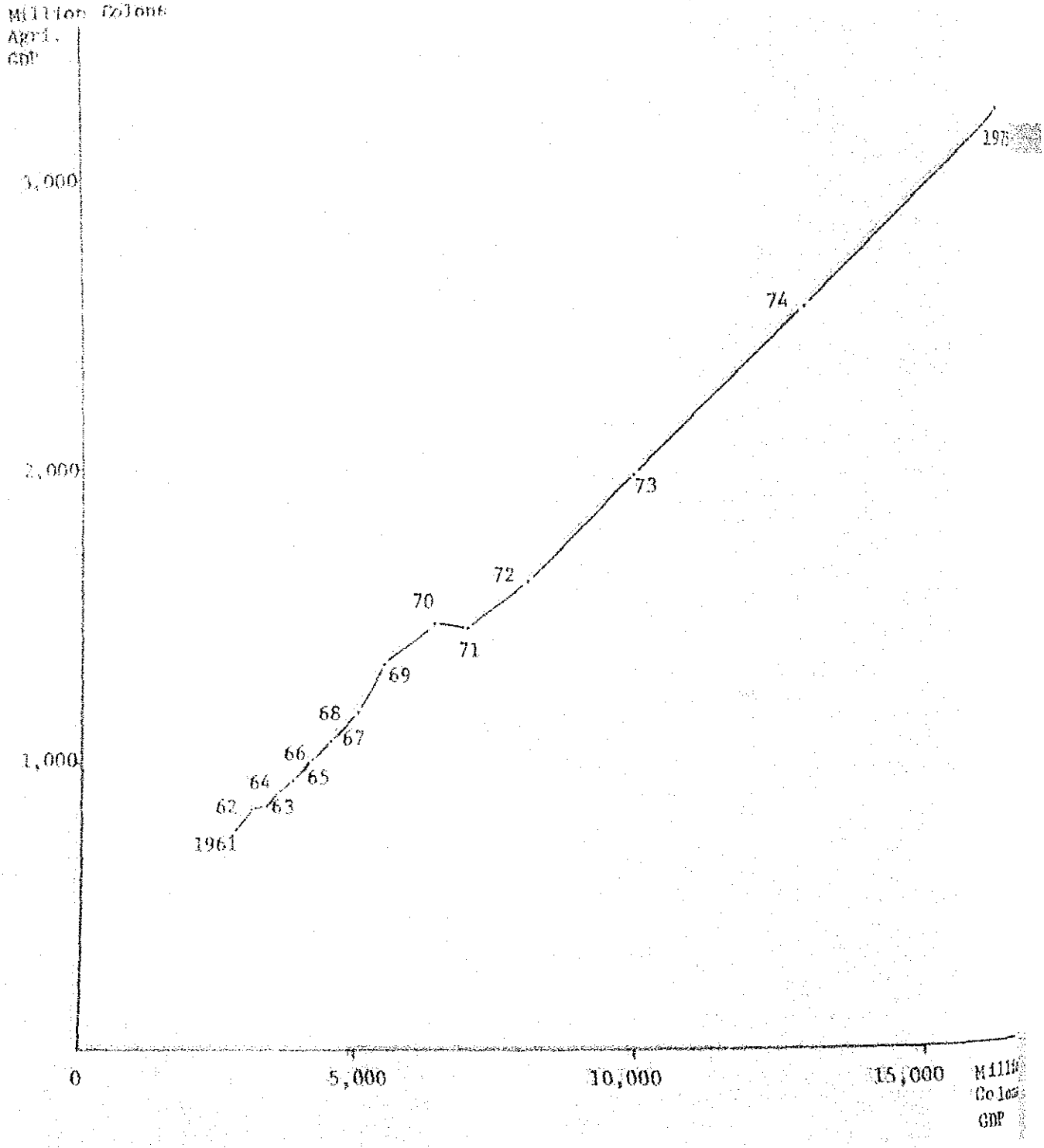
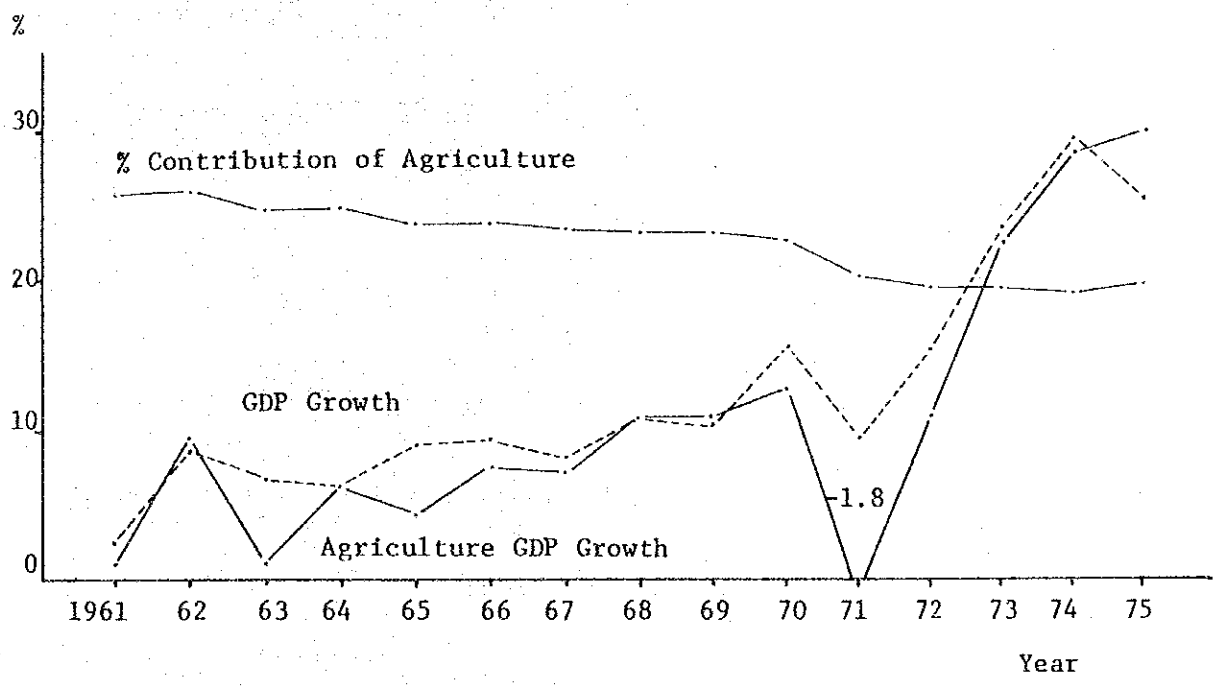


Figure 3.2

Growth Rates of GDP and Agricultural GDP and % Contribution of Agriculture in Costa Rica, 1961 - 1975



The agricultural sector has contributed also to provide employment for about 36 percent of the total economically active population of the country.[2/] The percentages of agricultural employment, however, differ considerably by province. San Jose has only 17 percent in agriculture, while other regions have about 40 percent of their active population employed in agricultural activities.

Costa Rica's agriculture, for the past fifteen years, has almost linearly developed in terms of its contribution to the gross domestic product at current prices. Historically, however, there seems to have been a shift of the expansion path between the two periods which could be clearly discernible on statistical figures. These two periods are 1961 to 1970 and 1971 to 1975.

The combined estimate of the expansion path may be represented by the following equation.

$$Y = -7.7897 + 0.1966X + 179.8709D$$
$$\quad\quad (42.64) \quad (0.0036) \quad (29.753)$$
$$R^2 = 0.999$$
$$D.W. = 1.754$$

where X represents G.D.P. at current prices
Y represents Agricultural G.D.P. at current prices
and D representing a dummy variable taking 1 for 1961 to 1970 and 0 for 1971 to 1975.

The percentage share of agricultural G.D.P. in the country can be expressed by;

$$\frac{Y}{X} = \frac{(-7.789 + 179.87\ D)}{X} + 0.1966$$

which is a monotonic decreasing function of X, i.e. G.D.P. In fact, agriculture's share of the G.D.P. has declined from 26% in 1961 to 19% in 1975.

Looking at the growth rates for G.D.P. and its share to agriculture, impressive double digit annual growth rates in current prices since 1971 appear to be attributable to the general inflationary tendency of the economy.

Taking, therefore, a deflated series of G.D.P. at 1966 prices, one can also find a nearly linear trend line for the 1966 to 1975 period as follows:

$$Y = 472.318 + 0.12398\ X$$
$$\quad\quad (77.152) \quad (0.0129)$$
$$R^2 = 0.962$$
$$D.W. = 1.138$$

These estimates indicate that the economy has developed at a rather steady pace in real terms, and that the annual growth rates of G.D.P. have been around 6 percent during the past ten years, (to be exact, at a 6.495 percent annual rate).

Figure 3.3 Relation between Agricultural GDP and GDP in Constant Prices

1966 - 1975, Costa Rica

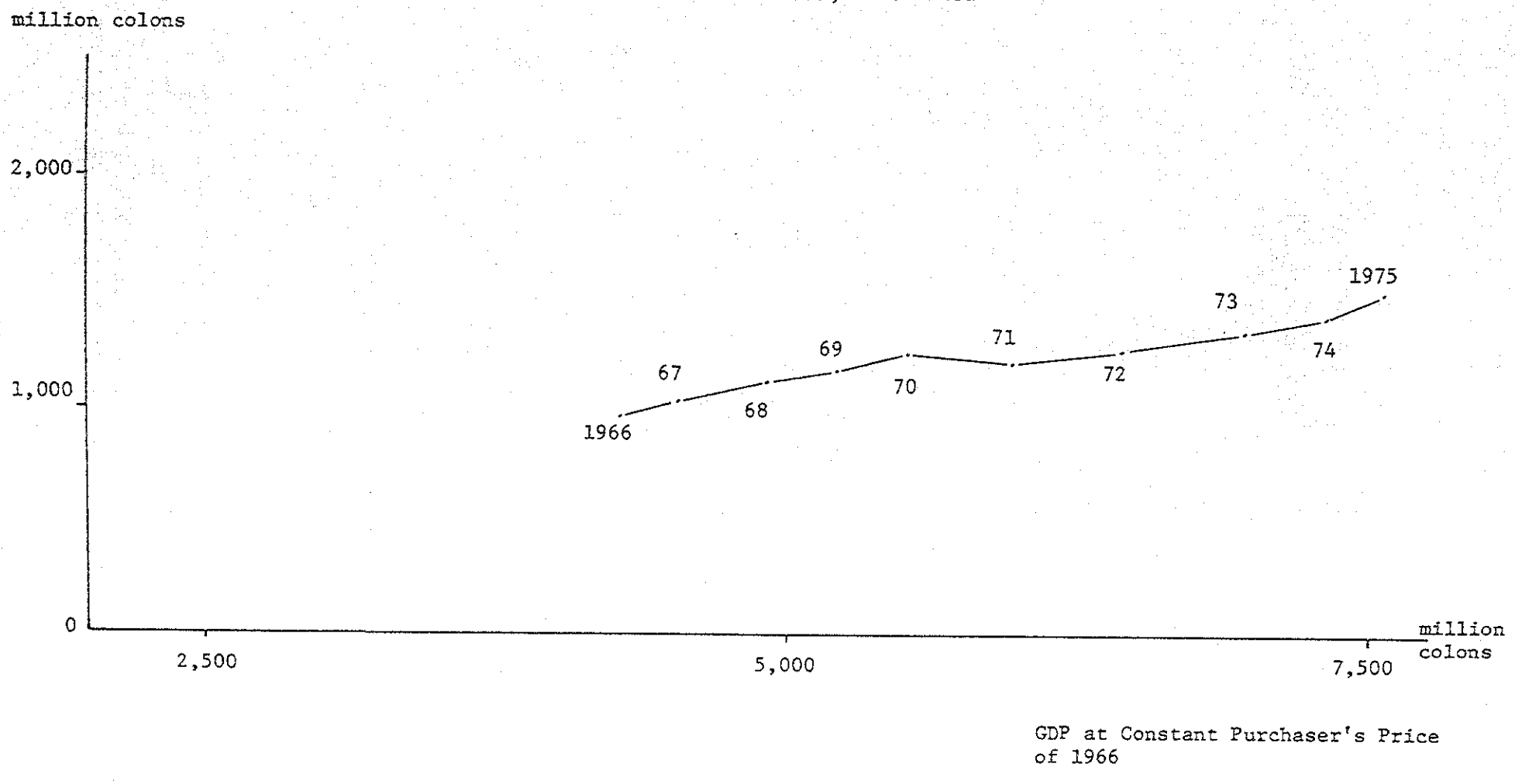


Figure 3.4 Growth Rates of GDP and Deflator

1967 - 1975, Costa Rica

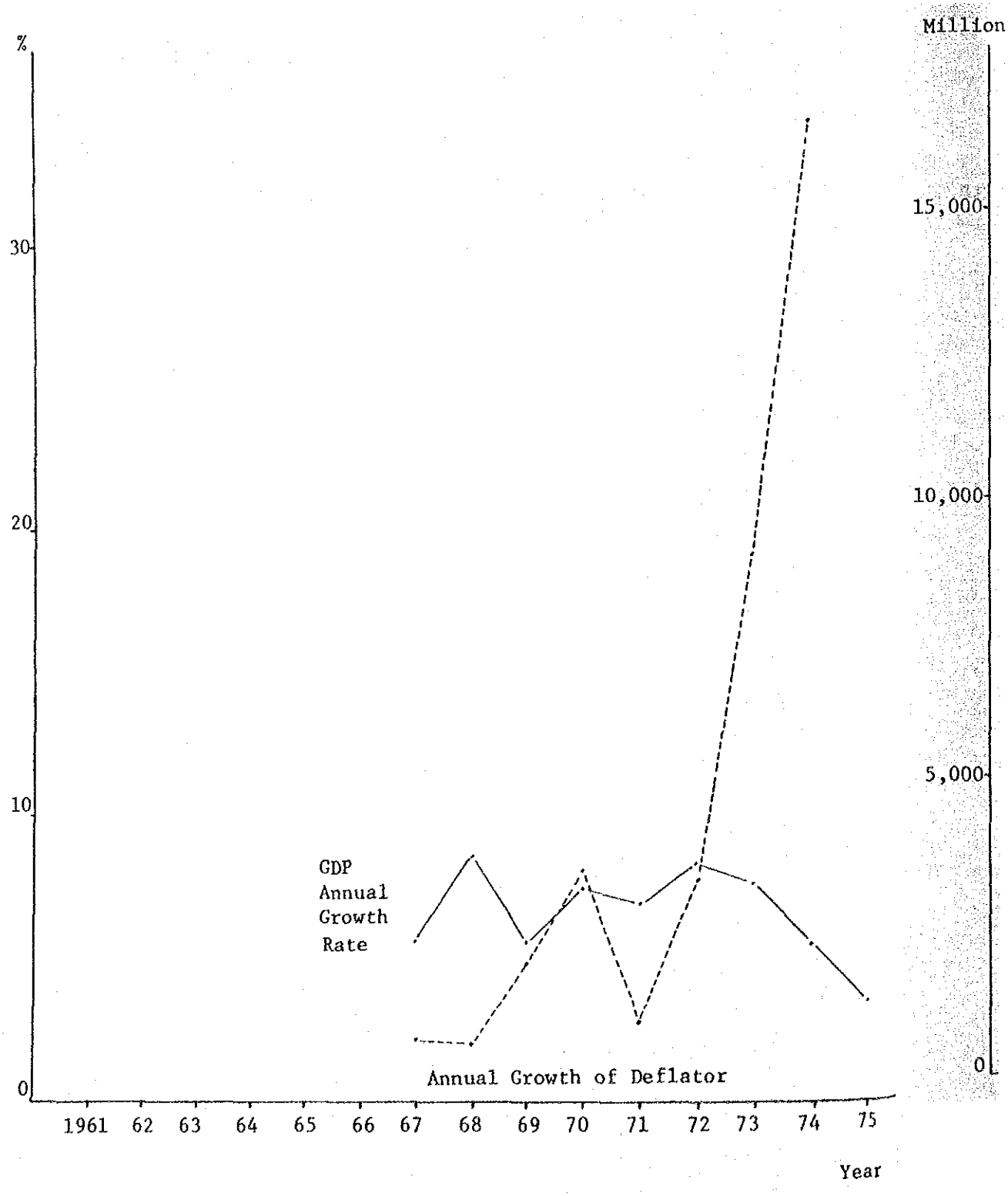
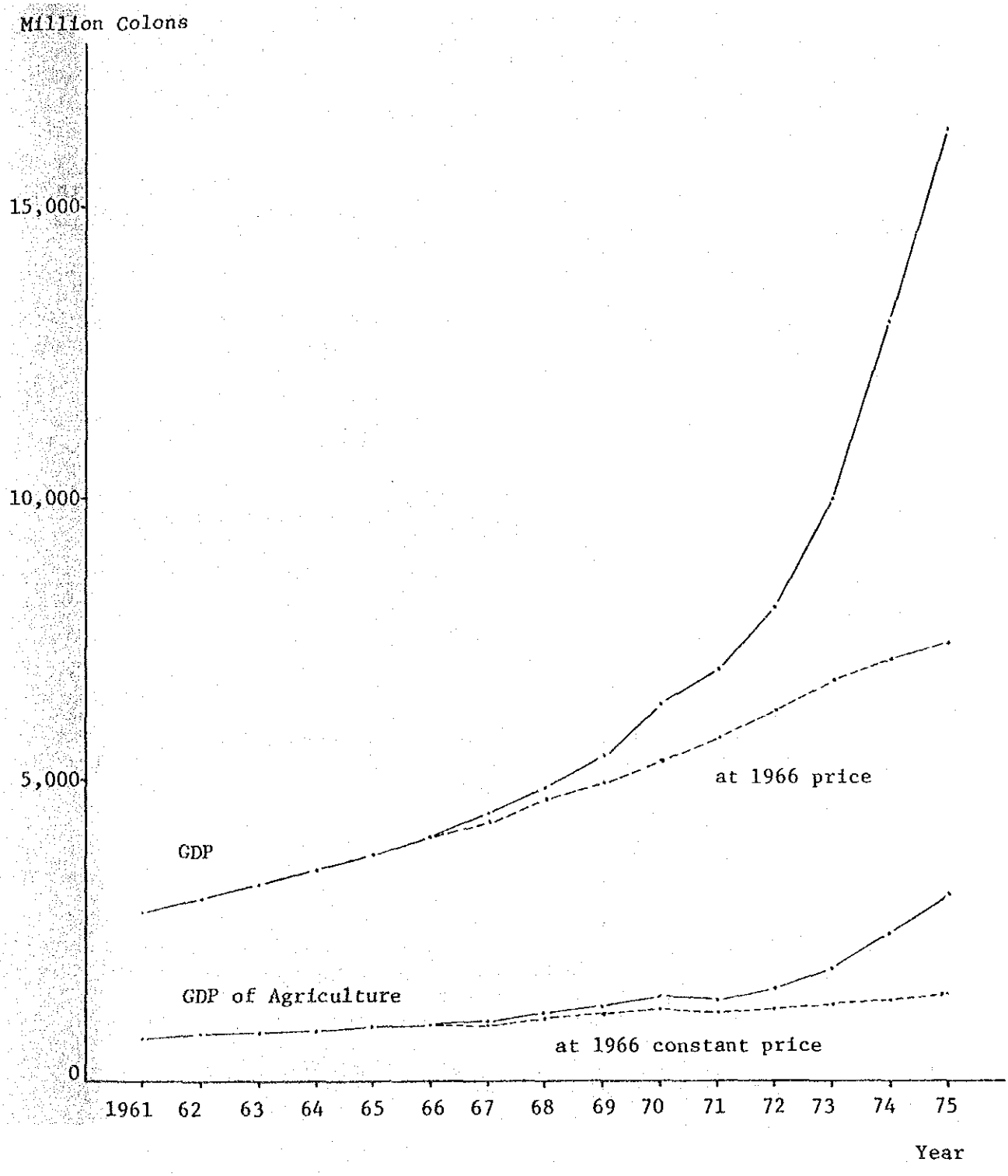


Figure 3.5 Growth Rates of GDP and Agricultural GDP in Costa Rica in Nominal and in Real Terms, 1961 - 1975



Agriculture's contribution to the G.D.P. in real terms has also grown during the same period at 4.69 percent annually.

During the same period the G.D.P. deflator has increased at 9 percent annually; this factor will explain the difference between real and nominal terms of growth of the economy.

The projection made by OFIPLAN for the year 2000 depicts a picture which is consistent with the above analysis of the past as far as annual growth rates for G.D.P. and agriculture's share of G.D.P. are concerned, although there are slight differences on the assumptions adopted. These minor differences may very well be considered within a margin of error.

	1966 - 1975 Average Annual Growth Rate	Assumed Growth for 2000
G.D.P. (Real)	6.495%	6.5%
Agriculture (Real)	4.69 %	4.4%

Population increases have been projected for the year 2000 on various assumptions, which range from low to high population estimates varying from 3,617,555 to 3,185,485 in 2000.

The annual compound rates of population growth for these variances range from 2.47 percent to 1.93 percent, respectively.

Roughly estimating, then, the annual growth rates of these vari- G.D.P. and of per caput Agricultural G.D.P. would range somewhere around 3.93 to 4.48 percent in the case of total G.D.P. and 2.07 to 2.70 percent for Agriculture G.D.P., respectively. These are, of course, rough estimates, but they still indicate considerable increases in per caput figures, in real terms, for the coming twenty-five years.

Over the last ten years, per caput food intake has improved and in the future it will further improve, but the rate at which such improvement will take place would be indeed very little in terms of the essential food elements. According to the food balance sheet compiled by the FAO, during the period of 1961 to 65 and to 1974 the nutritional intake per caput has continually improved, and their annual increments are, respectively.

Calories	1.4%
Proteins	1.3%
Fats	1.6%

It would not be rational to consider that such rates of increasing intake of nutrition will continue in the future, but even if we assume such increases, there would be still some surplus agricultural production over domestic demand in aggregate terms. Such surpluses of real agricultural G.D.P. over and above the domestic food consumption would roughly accumulate at an annual rate of 0.4 percent at the minimum to 1.4 percent at the maximum, after taking into consideration the different projections for population increase.

The magnitudes of annual growth rates of the aggregates mentioned above, by themselves, may not mean much; they are subject to changes according to various conditions. What is important, however, would be the fact that the agricultural G.D.P. could grow at a faster rate than that of population, thereby probably producing some surpluses in the gross production in agriculture.

This will imply several economic consequences. First of all, different from other developing countries with higher population density and food shortages, Costa Rica will not face food problems as such in the foreseeable future. On the contrary, therefore, the country may face what is known as agricultural problems. The possible components of such agricultural problems would involve: (1) differentials in productivity of labor in agriculture and in other economic activities, (2) differentials in income and welfare levels among different economic activities and (3) relative prices of the products, where agricultural products may claim relatively lower prices against higher prices of agricultural inputs and other consumer goods.

3.2.1 Relative Productivity and Income in Agriculture

As seen in many other countries, the earnings of the wage earners in agriculture are lower than those of other economic activities in Costa Rica.

According to one source, average monthly wages in 1976 are given for different industries as in the following table:

Table 3.1 Costa Rica: Average Monthly Earnings in 1976 Colons

Category	1976
Overall Average	1,095 (100)
Private Sector	850
Agriculture	653 (60)
Industries	1,105
Commerce	1,235
Government	2,093

Source: Dirección General de Estadística y Censos, Encuesta Nacional de Hogares, Empleo y Desempleo, Novembre 1976.

Apparently, agriculture places at the least earning economic activity and only earns 60% of overall average earning.

Agriculture as an industry has other types of earnings, such as proprietors' income, but as far as hired labor is concerned, its remuneration has been lower than that of any other economic activity.

Whether such a tendency will continue in the future or not should be analyzed as a problem demanding priority in agricultural policy of the country.

The growth rate of the rural population, during 1960 to 1973 has been 3.168 percent per annum, and the annual growth rate of agricultural income for the same period has been 4.69 percent. These figures should be compared to the corresponding figures for the country as a whole, namely a total population growth of 3.67 percent while G.D.P. has a 6.5 percent growth per annum.

By taking the differences in the two rates of growth, one can approximate per caput G.D.P. growth for agriculture and that for the total G.D.P. They are 1.53 percent for agriculture and 3.6 percent for the entire economy, indicating a considerable differential between the two.

This tendency should not continue in the future and could not, for the resulting disequilibrium between agriculture and other sectors will be too destructive. It, however, shows a potential aspect of Costa Rica's agricultural problems.

The changes in production of agricultural commodities can be seen in the changes of both per hectare productivity and that of the area devoted to respective crops. Which of these two factors has had more influence upon the changes in total production should be analyzed. However, by inspection, there seems to be a tremendous potential capacity existing in both directions for increasing agricultural production in the country.

Assuming, however, that labor costs in agricultural production may present a limiting factor, an intensive expansion of agriculture would be the easiest line to take first. In the past, yield of crops varied according to the types of product as seen below.

Yield of maize in Costa Rica based on the 1974 average was 1,000 kg per hectare while the world average yield was 2,510 kg per hectare and the regional average yield for Central and North American was 3,531 kg per hectare. Rice yield in Costa Rica on the average was 1,621 kg per hectare while the average yield for North Central America was 2,363 kg per hectare and that of the world was 3,853 kg. More efficient farms in the country produced 2,700 kg per hectare indicating a possibility of increasing yield of this crop.

Average sorghum yield in Costa Rica was 1,798 kg per hectare against 2,672 kg for North and Central America.

Yield of pulses also was 464 kg per hectare in Costa Rica while the Central and North American average was 911 kg.

The four kinds of grains mentioned above, which are designated as the basic grains by the government of the country, on the basis of statistical average have, so far, shown somewhat lower yields as compared to the North and Central American average yield.

There seems to be a number of reasons for such relatively low productivity per hectare; the reasons would be worthwhile to analyze in order to improve efficiency in production.

Other traditional products for exports from the country, on the other hand, have shown a considerably higher productivity as compared to the world average yield.

For example, average sugar cane yield in 1974 was 57,357 kg per hectare in Costa Rica against 50,471 kg for North and Central America. Bananas registered also 33,333 kg per hectare on average, while the North and Central American average was only 10,777 kg.

Similarly, coffee yield was 900 kg per hectare against 591 kg for the North and Central American average.

Milk yield per head for a year was not so good; it was only 948 kg in 1974 in Costa Rica as against 3,400 kg of the North and Central American average. There seems, however, enough room for raising the productivity of milk.

A table showing comparative average yield of various agricultural products is presented below.

Table 3.2 Production, Area and Yield

	1961 - 65	1972	1973	1974
Rice				
Production (1000 MT)	151	350	375	400
Area (1000 ha)	102	140	190	195
Yield (kg/ha)				
Costa Rica	1,488	2,500	1,974	2,051
North and Central America	3,192	3,928	3,629	3,853
World	2,048	2,260	2,402	2,363

(cont'd)

	1961 - 65	1972	1973	1974
Maize				
Production (1000 MT)	67	64	52	55
Area (1000 ha)	62	55	52	55
Yield (kg/ha)				
Costa Rica	1,080	1,150	1,011	1,000
North and Central America	3,300	4,713	4,441	3,531
World	2,171	2,792	2,785	2,510
Sorghum				
Production (1000 MT)	8	13	8	16
Area (1000 ha)	5	8F	4	9
Yield (kg/ha)				
Costa Rica	1,619	1,686	2,000	1,798
North and Central America	2,723	3,443	3,392	2,672
World	934	1,159	1,237	1,103
Roots and Tubers				
Production (1000 MT)	33	43	49	50F
Area (1000 ha)	6	6	6	6F
Yield (kg/ha)				
Costa Rica	5,725	7,294	8,752	8,842
North and Central America	16,347	18,656	18,469	19,701
World	10,082	10,426	11,105	9,903
Potatoes				
Production (1000 MT)	23	34	35F	36F
Area (1000 ha)	3	3	4F	4F
Yield (kg/ha)				
Costa Rica	7,189	10,059	10,000	10,343
North and Central America	20,192	23,817	23,293	24,899
World	11,927	12,827	14,399	13,393
Yuca				
Production (1000 MT)	10	9	14	14F
Area (1000 ha)	3	3F	2	2F
Yield (kg/ha)				
Costa Rica	3,864	3,534	6,649	6,455
North and Central America	5,820	6,441	6,554	6,447
World	8,580	9,350	8,871	8,831
Pulses				
Production (1000 MT)	17	10	11	10
Area (1000 ha)	47	12	27	22
Yield (kg/ha)				
Costa Rica	370	837	413	464
North and Central America	730	808	875	911
World	621	666	676	666

(cont'd)

	1969	1970	1971	1972	1973	1974
Seed Cotton						
Production (1000 MT)	8	4	1	1	1	1
Area (1000 ha)	6	3	1F	1F	1F	1F
Yield (kg/ha)						
Costa Rica	1,188	1,176	820	750	756	1,075
North and Central America	1,414	1,402	1,450	1,604	1,610	1,456
World	1,018	1,052	1,096	1,123	1,164	1,170

	1961 - 65	1972	1973	1974
Cabbages				
Production (1000 MT)	4	6F	7F	7F
Area (1000 ha)	> 1	> 1F	> 1F	> 1F
Yield (kg/ha)				
Costa Rica	7,655	7,529	7,614	7,692
North and Central america	16,527	17,170	17,060	17,500
World	18,389	19,400	19,068	19,332
Tomatoes				
Production (1000 MT)	9	14F	15F	15F
Area (1000 ha)	1	2F	2F	2F
Yield (kg/ha)				
Costa Rica	7,567	7,368	7,250	7,143
North and Central America	21,280	28,540	28,179	30,248
World	17,118	20,142	20,480	21,623
Onions (Dry)				
Production (1000 MT)	6	8F	8F	8F
Area (1000 ha)	1	1F	1F	1F
Yield (kg/ha)				
Costa Rica	8,735	9,111	8,830	8,571
North and Central America	24,527	26,556	25,241	27,246
World	10,795	11,223	11,283	11,298
Sugar Cane				
Production (1000 MT)	1,082	2,248F	2,246	2,300F
Area (1000 ha)	24	45F	39	40F
Yield (kg/ha)				
Costa Rica	45,139	49,501	57,945	57,357
North and Central America	53,185	53,162	50,579	50,471
World	49,529	52,776	53,806	53,424
Bananas				
Production (1000 MT)	462	1,250	1,300F	1,100F
Area (1000 ha)	27	40F	40F	33F
Yield (kg/ha)				
Costa Rica	17,450	31,646	32,500	33,333
North and Central America	9,462	11,565	11,496	10,777
World	12,207	13,678	13,597	13,587

(cont'd)

	1961 - 65	1972	1973	1974
Coffee (Green)				
Production (MT)	59,800	80,100	71,949	85,500
Area (ha)	80,360	95,000F	83,407	95,000F
Yield				
Costa Rica	744	843	863	900
North and Central America	511	573	564	591
World	444	508	465	523
Cocoa Beans				
Production (MT)	10,340	5,000	6,000	7,000
Area (ha)	29,780	30,000F	32,000F	32,400F
Yield (kg/ha)				
Costa Rica	347	167	188	216
North and Central America	397	423	354	392
World	278	307	288	304
Tobacco Leaves				
Production (MT)	1,380	2,208	2,500	2,600F
Area (ha)	1,520	1,892	2,000F	2,000F
Yield (kg/ha)				
Costa Rica	908	1,167	1,250	1,300
North and Central America	1,882	2,012	1,959	2,023
World	1,109	1,201	1,203	1,230
Beef and Veal				
Production (1000 MT)	31	56	48	58
Slaughtered Animal (1000 Head)	142	232	230	254F
Yield (kg/annual)				
Costa Rica	222	240	208	227
North Central America	211	249	253	243
World	164	192	193	195
Pork				
Production (1000 MT)	3	6F	7F	7F
Slaghtered Animal (1000 Head)	93	164F	176F	180F
Yield (kg/an)				
Costa Rica	35	37	37	37
North Central America	63	69	71	71
World	63	67	67	68
Cow Milk (Whole Fresh)				
Production (1000 MT)	131	210	242	230F
Number of Cows (1000 Head)	142	224	220F	231F
Yield (kg/an)				
Costa Rica	920	938	1,100	998
North Central America	2,193	3,454	3,382	3,400
World	1,722	1,899	1,910	1,934

Table 3.3 Costa Rica: Merchandize Export

(thousand US dollars)

	1965	%	1966	%	1967	%	1968	%	1969	%	1970	%	1971	%	1972	%	1973	%	1974	%
Coffee	46,627	41.7	52,640	38.8	54,841	38.1	55,264	32.4	55,833	29.4	73,081	31.6	59,299	26.3	77,851	27.7	94,012	27.3	124,757	28.3
Volume (46kg.Sacks)	48,300		54,832		66,148		68,540		67,666		69,092		63,940		86,066		72,910		90,114	
Unit Value	0.965		0.960		0.829		0.806		0.825		1.058		0.927		0.905		1.289		1.384	
Banana	28,266	25.3	29,186	21.5	30,928	21.5	42,778	25.0	51,548	27.2	66,771	28.9	63,983	28.4	82,830	29.5	90,682	26.3	98,353	22.3
Volume (kg)	316,040		358,739		371,046		553,251		694,575		855,974		922,259		1077,854		1178,511		1037,553	
Unit Value	0.089		0.081		0.083		0.077		0.074		0.078		0.069		0.077		0.077		0.095	
Meat	5,189	4.6	6,863	5.1	9,521	6.6	12,281	7.2	15,085	8.0	17,984	7.8	20,538	9.1	30,271	10.8	32,644	9.5	34,177	7.8
Volume (kg)	10,746		11,184		12,937		15,469		16,839		17,475		18,617		26,131		21,763		28,251	
Unit Value	0.483		0.614		0.736		0.794		0.896		1.029		1.103		1.158		1.500		1.210	
Sugar	4,655	4.2	8,693	6.4	8,390	5.8	8,710	5.1	9,099	4.8	10,144	4.4	12,929	5.7	13,082	4.7	21,502	6.2	24,446	5.6
Volume (metric ton)	37,950		64,630		62,420		62,510		62,840		67,390		83,120		77,420		113,160		69,870	
Unit Value	0.123		0.135		0.134		0.139		0.145		0.151		0.156		0.169		0.190		0.350	
Cacao	2,215	2.0	3,103	2.3	3,146	2.2	2,955	1.7	7,063	3.7	1,929	0.8	1,541	0.7	2,983	1.1	4,361	1.3	5,906	1.3
Volume (46kg.Sacks)	6,762		7,728		7,176		4,600		8,050		3,174		3,542		6,072		4,738		4,370	
Unit Value	0.328		0.402		0.438		0.642		0.877		0.608		0.435		0.491		0.920		1.351	
Fertilizer	3,564	3.2	2,445	1.8	2,806	2.0	4,432	2.6	3,026	1.6	2,410	1.0	3,890	1.7	5,903	2.1	7,596	2.2	12,948	2.9
Volume (metric ton)	42,460		29,300		30,820		52,260		41,720		32,430		61,960		77,140		83,580		70,150	
Unit Value	0.084		0.083		0.091		0.085		0.073		0.074		0.063		0.077		0.091		0.185	
Other Products	21,308	19.1	32,579	24.0	34,148	23.8	44,401	26.0	48,053	25.3	58,844	25.5	63,183	28.0	67,957	24.2	93,667	27.2	139,757	31.7
Industrials	15,860	14.2	24,997	18.4	27,036	18.8	35,723	20.9	39,130	20.6	51,062	22.1	54,716	24.3	58,633	20.9	79,388	23.0	119,299	27.1
Cattle	5,448	4.9	7,582	5.6	7,112	5.0	8,678	5.1	8,923	4.7	7,782	3.4	8,467	3.7	9,324	3.3	14,279	4.2	20,458	4.6
Total	111,824	100	135,509	100	143,780	100	170,821	100	189,707	100	231,163	100	225,363	100	280,877	100	344,464	100	440,344	100
Of which Agri. Total	92,400	82.6	108,067	79.7	113.938	79.2	130,666	76.5	147,551	7778	177,691	76.9	166,757	74.0	216,341	77.0	257,480	74.7	308,097	70.0

Source: Dirección General de Estadística y Censos.

Cuadro N°2 (p. 67,68) Balanza de Pagos, 1974 Departmento Monetario, Banco Central de Costa Rica.

Table 3.4 Costa Rica: Imports by Commodity

(thousand US dollars)

	1971			1972			1973			1974		
	Rest of the World	Central America	Total	Rest of the World	Central America	Total	Rest of the World	Central America	Total	Rest of the World	Central America	Total
1. Agriculture, hunting, forestry & fishery	11,817	8,866	20,683	10,551	10,576	21,127	21,642	4,892	26,539	44,310	10,965	55,275
11. Agriculture & hunting	11,586	8,733	20,319	10,405	10,290	20,695	21,428	4,634	26,062	43,986	10,630	54,616
12. Forestry & fishery	231	133	364	146	286	432	214	263	477	324	335	659
2. Mining & quarrying	930	1,016	1,946	857	1,198	2,055	1,151	1,648	2,799	3,847	1,080	4,927
3. Manufacturing Industries	259,800	66,549	326,349	281,377	67,671	349,048	344,211	76,537	420,748	555,254	101,206	656,460
31. Food, beverage, tabacco	7,730	12,839	20,569	5,871	10,047	15,918	8,604	11,017	19,621	12,524	14,349	26,873
32. Textile & leather	17,663	23,027	40,690	16,700	23,065	39,765	18,478	23,507	41,985	34,020	28,505	62,525
33. Wood products	520	1,379	1,899	523	1,261	1,784	467	1,400	1,867	878	1,820	2,698
34. Paper & printing	22,486	3,118	25,604	26,275	3,710	29,985	30,794	5,500	36,294	47,727	8,370	56,097
35. Chemical & related products	60,964	12,502	73,466	70,629	14,779	85,408	94,683	17,931	112,614	178,212	25,264	203,476
36. Non-metallic minerals	5,075	2,084	7,159	4,789	2,999	7,788	6,613	3,916	10,529	9,002	4,147	13,149
37. Basic metals	17,037	1,100	18,137	21,710	1,167	22,877	26,776	834	27,610	54,877	1,067	55,944
38. Metal products & machinery	120,386	6,409	126,795	128,799	7,208	136,007	150,124	8,186	158,310	208,199	10,991	219,190
39. Other manufacturing Industires	7,939	4,091	12,030	6,081	3,435	9,516	7,672	4,246	11,918	9,815	6,693	16,508
4. Others	698	67	765	534	11	545	4,651	589	5,240	2,366	635	3,001
Total	273,245	76,498	349,743	293,319	79,456	372,775	371,655	83,671	455,326	605,777	113,886	719,663
Agricultural Total			109,445			108,579			126,306			203,468
(11+12+31+32+33+34) and %			31.3%			29.1%			27.7%			28.3%

3.2.2 Foreign Trade in Agriculture

Traditionally, Costa Rica's agriculture has contributed to a considerable extent to the export earnings of the country. Out of total
through the years. Agricultural exports consist around 70 to 75 percent of total exports in recent years as is seen in Table 3.3.

Two commodities stand out, namely coffee about 28 percent and bananas about 25 percent. Other agricultural products also gather up to 27 percent in 1974.

Costa Rica's imports have been continually larger than its exports. (See Table 3.4) As a consequence, the balance of trade for goods and non-factor services has been negative throughout the years.

Over the past 20 years, imports at constant prices amounted to 32 to 35 percent of the gross domestic income and exports 27 to 28 percent. Consequently, about 6.1 to 6.9 percent or resource gap against the gross domestic income persisted, and it has been increased consistently up to 1974, and decreased in 1975 to 1976.

Out of the total imports, goods that originated from foreign agriculture add up to some 28 percent, including (11) agriculture and hunting, (12) forestry and fishing and processed agricultural products such as (31) food, beverages and tobacco, (32) textile and leather, (33) wood products and (34) paper and printing.

The unfavorable foreign trade gap, if it should continue to increase, would create problems in the future for the economic development of Costa Rica. According to an analysis performed by the World Bank, the following demonstrates comparative conditions of different periods. (See Table 3.5)

Table 3.5 As Percentage of G.D.Y.

	1960 - 73	1965 - 73
Gross Domestic Product	99.1	99.9
Gain from Terms of Trade Change	0.9	0.1
Gross Domestic Income	100.0	100.0
Imports, Constant Prices	32.9	35.0
Exports, Capacity to Import	-26.9	-28.1
Resource Gap	6.1	6.9

In the above, gross domestic income at constant prices equals G.D.P. at constant market prices plus gains from changes in the terms of trade. To allow international comparisons, gross domestic income at

constant prices is expressed in constant 1967 to 1969 U.S. dollars. As seen in the table, the resource gap is increasing over time, which is taken for about ten years. In 1967 to 1969 U.S. dollars, the gap corresponds to 60 million dollars annually.

In order to search for strategies of either export promotion or import substitution or both, the possibilities of exporting agriculturally related goods will be examined.

The net exports of agriculture, hunting, forestry and fishing are now reduced to some 86 to 76 percent of the export total. An outstanding feature is that from 1972 the net export of forestry, wood and fish turned negative, indicating the import of these goods is larger than the export. Textiles and leather products also indicate net negative exports, but these items may include such materials than those of agricultural origin.

Limiting foreign trade items to only agriculture and food and beverages, there is seen a tendency such that the contribution of gross agricultural exports ranges from 70 to 78 percent of the total exports during the past 10 years, but in net terms the contribution has been reduced to 52 to 64 percent during the past 4 years from 1971 to 1974. This indicates the import of a considerable amount of processed goods of agricultural origin.

As the economy develops and income levels rise, more and more processed foods and drinks will be demanded; there seems to be considerable room for import substitution and export diversification through domestic industries processing agricultural raw materials into processed food and beverages. (See tables 3.6 and 3.7)

3.2.3 Domestic Food Supply and Demand

Agricultural production as a whole, expressed in terms of value added or G.D.P. appears to grow much faster in Costa Rica than the growth of population as has already been seen earlier. The aggregate value of production of agriculture includes, in the main, three groups of products, namely, (1) domestic food products, (2) raw materials for domestic processing and (3) exports as primary commodities or in some processed form.

In this section, attention will be given to the first group of agricultural products. (See Table 3.8)

Over the years, a large amount of cereals and milk has been consumed by the domestic population. Over-time changes indicate that three groups of goods, namely, (1) pulses, nuts and seeds, (2) eggs and (3) fats and oils have increased more than 30 percent as a food product during the last ten years.

Table 3.6 Net Exports of Agriculturally Related Goods

(Exports minus Imports)

(thousand U.S. dollars)

	1971	1972	1973	1974
Agriculture, hunting, forestry, fishery	106,504	146,904	168,409	179,145
% of exports	83.7	87.4	86.4	76.4
(11) Agriculture, hunting	106,456	147,216	168,705	179,509
% of exports	84.0	87.7	86.6	76.7
(12) Forestry, fishery	48	-312	-396	-364
% of exports	11.7			
Manufacturing Industries	-231,416	-240,700	-278,022	-460,163
(21) Foods, drinks & tobacco	20,408	32,469	43,014	50,862
% of exports	49.8	67.1	68.7	65.4
(22) Textile leather products	-32,370	-31,312	-28,231	-38,811
(23) Furnitures, woods prod.	555	1,475	1,878	3,498
% of exports	22.6	45.3	50.1	56.5
Total (21 + 22 + 23)	-11,407	2,632	16,661	15,549
% of exports		4.4	20.8	14.4
Total (Exports - Imports)	-127,552	-96,354	-110,862	-279,319

Table 3.7 Gross and Net Exports of Agriculture, Costa Rica

	1971	1972	1973	1974
ΔExports:				
Agriculture, hunting, forestry, fishery	127,187	168,031	194,948	234,420
Foods, drinks & tobacco	40,977	48,387	62,635	77,735
Sub-total	168,164	216,418	257,583	312,155
% of Agri. Exports to Total Exports	75.7	78.2	74.8	70.9
ΔImports:				
Agriculture, hunting, forestry, fishery	20,683	21,127	26,539	55,275
Foods, drinks & tobacco	20,569	15,918	19,621	26,873
Sub-total	41,252	37,045	46,160	82,148
ΔNet Exports of Agriculture	126,912	179,373	211,423	230,007
ΔTotal Exports	222,191	276,421	344,464	440,344
% of net exp. of agriculture to the total exports	57.1	64.9	61.4	52.2

Table 3.8

Costa Rican - Net Food Supply Per Caput (FAO)

(grams per day)

Period	Cereals	Potatoes, Other Sundry Staple Food	Sugars & Sweets	Pulses, Nuts, Seeds	Vegetable	Fruits	Meat	Egg	Fish	Milk	Fats & Oils (Fat Contents)
1961 - 63	233	137	118	28	59	159	71	15	5	282	24
64 - 66	250	137	123	31	60	163	70	16	6	298	26
67 - 69	259	137	124	38	62	169	69	19	6	330	29
1970	266	137	124	37	63	162	72	20	6	353	32
1970/62	1.14	1.0	1.05	1.32	1.07	1.02	1.01	1.33	1.2	1.25	1.33
											+3.6%/year

These items are all high quality foods, mainly containing protein and fats. As G.D.P. has increased over these years at about 6 percent per annum, the income elasticity of demand for these high quality food products can be approximated at about +0.5 or in its vicinity.

All other foods have also increased, but their rates of increase have remained much less, though all of them have shown positive income elasticities of demand.

Available statistics, such as the FAO food balance sheets for 1964 to 1966 average, indicate that nearly all food items have been domestically produced. Only a few items of food have been supplied through imports. These imported food items are enumerated in Table 3.9.

Among others, a number of processed food items are supplied through import. Particularly noticeable are wheat flour, fats and oil, and milk and fish products.

A further examination of the entire food balance sheet indicates possibilities of supplying these imported food items through domestic production on the basis of domestic agricultural products. For example, milk products could very well be self-sufficient; fish products also could be provided domestically through increased production, while canned fruits may be made available domestically instead of exporting the raw materials.

While no further analyses will be made on the food balance sheet, a complete table for 1964 to 1966 is presented above. It is a useful table and could become a basis for future planning of agricultural development if more up-to-date figures could be provided. (See Table 3.10, Costa Rica's Food Balance Sheet 1964 to 1966.)

3.2.4 A Summary of Agricultural Policy in the Country

Agricultural policy objectives set by the Government of Costa Rica indeed appear appropriate in view of the foregoing analyses. Policy priorities of the government consist of the following:

(a) Achieving self-sufficiency in four basic grains, including rice, sorghum, maize (or corn) and beans.

The main part of this objective has now been well achieved; two out of four basic crops have now reached the target of self-sufficiency. These two are rice and sorghum; corn and beans, however, are still short of reaching the target.

The main policy instrument used for implementing this policy has been the instrument related to the marketing, price and credit policy which has been executed mainly by the National Production Council and the National Banking System. The National Production Council, while achieving a remarkable increase in the production of rice, appears to be facing some new difficulties of a different dimension.

Table 3.9 Food Balance Sheet for Costa Rica

Cereals	1964 - 66 (hundred metric tons) Domestic Production	Imports	Food Consumption Processed	Food
Wheat		439	9	431
wheat flour	1	14		14
flour preparations	9	4		4
wheat semolina				
Rice				
milled paddy	417	41	4	454
Pulses, Nuts and Seels				
coconuts	75	1	76	
cottonseed	51	10	59	
Vegetables				
preserved (unspecified)		5		3
Fruits				
preserved (unspecified)		13		9
Milk				
dry milk	11	1		12
semiskim milk	6	1		7
dried skim	4	1		7
condensed milk		11		11
milk preparations		2		2
Fish				
marine	22	5		27
canned fish		12		12
Oils and Fats				
palm nut oil	86	16		90
cottonseed oil	10	30		40
unspecified oil	1	14		4

Table 3.10 Food Balance Sheet for Costa Rica

POPULATION: 1,490 (thousands) (hundred metric tons unless otherwise specified) YEAR: 1964 - 66 Average

COMMODITY	PRODUCTION		Changes in STOCKS	Gross IMPORTS	Total SUPPLY	Gross EXPORTS	DOMESTIC UTILIZATION							PER CAPUT CONSUMPTION				
	Input	Output					TOTAL	FEED	SEED	MANUFACTURE for FOOD	MANUFACTURE for Industrial use	WASTE	FOOD	Kilogr. per year	Grams per day	CALORIES per day number	PROTEINS per day grams	FAT per day grams
CEREALS																		
WHEAT				1	1		1			1								
wheat/FLOUR	1	1		439	440		440			9			431	28.9	79.3	289	9.0	0.9
flour/PREPARATIONS	9	9		14	23	9	14						14	1.0	2.6	10	0.3	-
wheat/SEMOLINA				4	4		4						4	0.3	0.8	3	0.1	-
RICE PADDY	-	722		6	728		728		38	668		22						
paddy/MILLED	668	417		41	458		458			4			454	30.5	83.5	304	6.0	0.5
milled/BEER	4	*																
MAIZE	-	721		74	795		795	278	12	465		40						
maize/TORTILLA	465	818			818		818						818	54.9	150.3	305	6.6	3.5
SORGHUM	-	103			103		103	97	1			5						
barley/MALT				15	15		15			15								
malt/BEER	15	*																
Total																911	22.0	4.9
STARCHY FOOD																		
POTATOES	-	237		1	238		238		25			24	189	12.7	34.8	23	0.8	0.1
PLANTAINS	-	370			370	25	345	18				56	271	18.2	49.9	48	0.3	0.1
CASSAVA	-	103			103		103					10	93	6.2	17.1	17	0.1	-
GUINEOS and PLANTAINS	-	776			776		776	194				388	194	13.0	35.6	27	0.2	0.1
Total																115	1.4	0.3
SUGAR																		
SUGAR CANE	-	13,167			13,167		13,167	70	327	12,639		131						
cane/RAW CENT.	10,911	1,007			1,007	461	546			546								
raw cent./REFINED	546	507	+4		503		503						503	33.8	92.6	355	-	-
cane/MOLASSES	10,911	327			327		327	231		96								
molasses/SPIRITS	96	*																
cane/RAW NON CENT.	1,728	198			198		198			20			178	12.0	32.8	117	.0.1	0.2
raw non cent/SPIRITS	20	*																
Total																472	0.1	0.2

(con't)

Food Balance Sheet

Costa Rica

POPULATION: 1,490 (thousands) (hundred metric tons unless otherwise specified) YEAR: 1964 - 66 Average

COMMODITY	PRODUCTION		Changes in STOCKS	Gross IMPORTS	Total SUPPLY	Gross EXPORTS	DOMESTIC UTILIZATION							PER CAPUT CONSUMPTION				
	Input	Output					TOTAL	FEED	SEED	MANUFACTURE for FOOD	MANUFACTURE for Industrial use	WASTE	FOOD	Kilogr. per year	Grams per day	CALORIES per day number	PROTEINS per day grams	FAT per day grams
PULSES, NUTS AND SEEDS																		
DRY BEANS	-	163		30	193		193		24			8	161	10.8	29.6	102	6.7	0.5
COCONUTS	-	75		1	76		76			76								
coconuts/COPRA	76	12			12		12			12								
copra/OIL	12	*																
PLAM NUT	-	571			571		571			571								
palm nut/OIL	571	*																
palm nut/PALM KERNELS	571	23			23	1	22			21		1						
palm kernels/OIL	21	*																
COTTONSEED	-	51		10	61		61		2	59								
cottonseed/OIL	59	*																
Total																102	6.7	0.5
VEGETABLES																		
ONIONS	-	67		1	68	5	63					6	57	3.8	10.5	4	0.2	-
TOMATOES	-	101			101		101					15	86	5.8	15.8	3	0.1	-
CABBAGES	-	49			49		49					4	45	3.0	8.3	2	0.1	-
OTHER	-	157		1	158	5	153					16	137	9.2	25.2	8	0.4	0.1
unspecified/PRESERVED		.		5	5	2	3						3	0.2	0.6	-	-	-
Total																17	0.8	0.1
FRUIT																		
BANANAS (for export)	-	3,294			3,294	3,031	263					263						
BANANAS (for local supply)	-	951			951		951	286				380	285	19.1	52.3	35	0.5	0.1
ORANGES	-	467			467		467					70	397	26.7	73.1	20	0.4	0.1
PINEAPPLES	-	42			42		42					9	33	2.2	6.1	2	-	-
AVOCADOS	-	128			128		128					13	115	7.7	21.2	18	0.2	1.8

(con't)

Food Balance Sheet

Costa Rica

POPULATION: 1,490 (thousands) (hundred metric tons unless otherwise specified) YEAR: 1964 - 66 Average

COMMODITY	PRODUCTION		Changes in STOCKS	Gross IMPORTS	Total SUPPLY	Gross EXPORTS	DOMESTIC UTILIZATION							PER CAPUT CONSUMPTION				
	Input	Output					TOTAL	FEED	SEED	MANUFACTURE for FOOD	MANUFACTURE for Industrial use	WASTE	FOOD	Kilogr. per year	Grams per day	CALORIES per day number	PROTEINS per day grams	FAT per day grams
OTHER	-	94		8	102	40	62					15	47	3.1	8.6	3	-	-
unspecified/PRESERVED				13	13	4	9						9	0.6	1.7	1	-	-
Total																79	1.1	2.0
MISCELLANEOUS VEGETAL																		
COCOA BEANS	-	95	+5		90	79	11			11								
cocoa beans/POWDER	11	5			5	2	3						3	0.2	0.5	2	-	0.1
cocoa beans/BUTTER	11	4			4	1	3						3	0.2	0.5	2	-	0.1
Total																4	-	0.2
MEAT																		
CATTLE[1]	-[1]	1,640			1,640	125	1,515			1,515								
cattle/MEAT	1,515[1]	336			336		336			94			242	16.3	44.6	42	7.9	0.9
meat/BONELESS	94[1]	68			68	68												
cattle/OFFALS	1,515[1]	68			68		68						68	4.5	12.4	18	2.0	1.0
cattle/FAT	1,515[1]	*																
PIGS[1]	-[1]	996			996	6	990			990								
pigs/MEAT	990[1]	41			41		41						41	2.8	7.5	16	0.8	1.4
pigs/OFFALS	990[1]	11			11		11						11	0.7	2.0	3	0.3	0.2
pigs/FAT	990[1]	*																
POULTRY[1]	-	22,640			22,640		22,640			22,640								
poultry/MEAT	22,640[1]	25			25		25						25	1.7	4.5	4	0.6	0.2
Total																83	11.6	3.7
EGGS																		
HEN EGGS	-	94			94		94		3			2	89	6.0	16.4	21	1.6	1.4
Total																21	1.6	1.4

(con't)

Food Balance Sheet

Costa Rica

POPULATION: 1,490 (thousands) (hundred metric tons unless otherwise specified) YEAR: 1964 - 66 Average

COMMODITY	PRODUCTION		Changes in STOCKS	Gross IMPORTS	Total SUPPLY	Gross EXPORTS	DOMESTIC UTILIZATION						PER CAPUT CONSUMPTION					
	Input	Output					TOTAL	FEED	SEED	MANUFACTURE for FOOD	MANUFACTURE for Industrial use	WASTE	FOOD	Kilogr. per year	Grams per day	CALORIES per day number	PROTEINS per day grams	FAT per day grams
MILK																		
COW MILK	-	1,633			1,633		1,633			446		81	1,106	74.3	203.4	132	6.7	7.1
milk/DRY	86	11		1	12		12						12	0.8	2.2	11	0.6	0.6
milk/CHEESE	8	1			1		1						1	0.1	0.2	1	-	0.1
milk/CREAM	46	4			4		4			2			2	0.1	0.4	1	-	0.1
cream/BUTTER	2	*																
milk/SEMISKIM	46	42			42		42			42								
semiskim/CHEESE	42	6		1	7		7						7	0.5	1.3	3	0.3	0.2
milk/BUTTER	306	*																
milk/SKIM	306	290			290		290			290								
skim/DRY	43	4	-2	1	7		7						7	0.5	1.3	4	0.5	-
skim/CHEESE	247	22			22		22						22	1.5	4.1	10	1.6	0.2
milk/CONDENSED				11	11		11						11	0.7	2.0	4	0.1	0.1
milk/PREPARATIONS				2	2		2						2	0.1	0.4	-	-	-
Total																166	9.8	8.4
FISH																		
MARINE	-	22		5	27		27						27	1.8	4.9	5	0.8	0.1
CRUSTACEANS	-	22			22		22			22								
crustaceans/FROZEN	22	15			15	11	4						4	0.2	0.6	-	-	-
TURTLES	-	3			3		3						3	0.2	0.6	-	-	-
unspecified/ CHANNEL				12	12		12						12	0.8	2.2	7	0.5	0.2
Total																12	1.3	0.3
OILS AND FATS																		
copra/OIL	12	7		1	8		8				1		7	0.5	1.3	11	-	1.3
palm nut/OIL	571	86	(+9)	16	93	3	90						90	6.0	16.5	145	-	16.4
palm kernels/OIL	21	11			11		11				11							
cottonseed/OIL	59	10		30	40		40						40	2.7	7.4	65	-	7.4
unspecified/OIL	-	1		14	15	11	4						4	0.3	0.7	7	-	0.7
Vegetal																228	-	25.8

(con't)

Food Balance Sheet

Costa Rica

POPULATION: 1,490 (thousands) (hundred metric tons unless otherwise specified) YEAR: 1964 - 66 Average

COMMODITY	PRODUCTION Input	PRODUCTION Output	Changes in STOCKS	Gross IMPORTS	Total SUPPLY	Gross EXPORTS	DOMESTIC UTILIZATION TOTAL	FEED	SEED	MANUFACTURE for FOOD	MANUFACTURE for Industrial use	WASTE	FOOD	PER CAPUT CONSUMPTION Kilogr. per year	Grams per day	CALORIES per day number	PROTEINS per day grams	FAT per day grams
cream/BUTTER	2	1			1		1						1	0.1	0.2	1	-	0.1
milk/BUTTER	306 1/	16			16	1	15						15	1.0	2.7	16	-	1.8
cattle/FAT	1,515 1/	24		10	34	1	33			2	31							
pigs/FAT	990 1/	18			18		18						18	1.2	3.3	7	0.3	0.6
Animal																24	0.3	2.5
																252	0.3	28.3
													GRAND TOTAL			2,234	56.7	50.3
													Vegetal			1,928	32.1	34.0
													Animal			306	24.6	16.3
BEVERAGE CROPS																		
COFFEE	-	583	6		577	514	63					5	58	3.9	10.7	24	1.3	1.6
BEVERAGES																		
milled/BEER	4	18			18		18						18	1.2	3.4	1	-	-
malt/BEER	15	100			100		100						100	6.7	18.3	7	0.1	-
molasses/SPIRITS	96	20			20		20						20	1.3	3.6	11	-	-
raw non cent./SPIRITS	20	11			11		11						11	0.7	2.0	6	-	-
Total																49	1.4	1.6

1/ Hundred head. - Centaines de têtes - Centenares de cabezas

Some of these difficulties may consist of determining appropriate price levels at which the Council buys the products from the farmers and sells them to consumers. Appropriate prices for farmers should be such as to satisfy: (1) maintaining enough domestic production and at the same time (2) supplying grain to the domestic market at reasonable consumer prices and for export in competition in the world market. This is a difficult task to achieve.

(b) Reducing dependency on imports of vegetable oils and fats

Costa Rica has been importing about 12 million U.S. dollars worth of vegetable oils annually.

Possible sources of vegetable oils and fats include: oil from cotton, African palm, soybeans, peanuts and sesame, etc. Augmentation of production in traditional oil crops such as cotton and oil palm should claim priority while other relatively new types of crops should also be introduced and increased. The chief policy means associated with this task seems to be through agricultural planning by the Government.

This appears to be a relatively new concept in the country and commenced since 1974 for this sector. In view of various experiences in implementing agricultural development plans in some other countries, which are not so well gifted as Costa Rica in agricultural resources, it is possible that valuable lessons could be learned for the future of this country.

(c) Integrated rural development

The purpose of this policy includes enhancing productivity of farms through improvements both in various agricultural technology, including the introduction of high-yielding varieties, and in infrastructure for agriculture, as well as eventually introducing by law and concept of agricultural zones. Naturally, the aims of this policy are inclusive ones and must be considered as an integral part of the ultimate objectives of general economic development of the country. A kind of social security system associated with agricultural zoning which is presently under consideration may deserve serious consideration. Under this system, a type of crop insurance scheme has been introduced for covering any unexpected losses incurred on the crops which are indicated for cultivation in the designated zones.

Rural colonization with improvement of land tenure system is being promoted under the auspices of ITCO (Instituto de Tierras y Colonización). This should be an effective method for promoting an integrated rural development. Experiences in successful management of family farms of relatively small size in other countries, in particular, Japan, Taiwan, etc., might prove useful for future development of policy in this country.

(d) Increase in foreign exchange earnings from traditional export commodities

As has been examined, traditional export commodities enjoy relatively high efficiency in production. In addition, due to special characteristics, Costa Rican coffee has enjoyed, in fact, an edge in marketability at favorable price levels.

While productivity per hectare of coffee has been rather high in Costa Rica, results of experimental stations indicate further possibilities in increasing yield. Improvement in productivity will be needed because the cost of production, particularly harvesting labor cost are rising rapidly. In 1974 about 37 percent of the cost of coffee production was attributable to the cost of harvesting labor alone.

3.3 Characteristics of Agriculture in the Pacifico Central Region

3.3.1 Some Definitions

The hinterland of Port Caldera as defined in Chapter I consists of, first, the core area which is essentially the urban districts of Gran Puntarenas. Secondly, the direct area of influence extends to cover what has been defined in Chapter I as "Pacifico Central" which includes the rural area of Puntarenas Province, Peninsula de Nicoya, some cantons and districts of San Jose, and Alajuela Provinces. (See the map of Pacifico Central of Costa Rica.)

This region of Pacifico Central is now to be analyzed from an agricultural perspective in order to develop the region in an integrated manner. The perspective taken in analyzing regional agriculture naturally differs from the perspective taken in doing so for the entire country's agriculture. The one relates to agriculture as an economic activity of the rural residents in the region and the other relates to the welfare aspects of the rural population. Although these two aspects cannot possibly be separated completely, emphasis, however, will be put on either point according to the nature of the purposes.

3.3.2 Strategic Characteristics of the Region

The region's basic characteristics will be first examined as far as the region relates to agriculture. Table 3.11 indicates Provinces and Cantons included in the Region. These are all administrative classifications and any clear criteria of economic or social nature are not used in defining the region. As will be seen later, the definition of this region differs to some extent from the corresponding regions adopted for the agricultural census of 1973.

The figures of the following table have been obtained from the two censuses of Agriculture taken in the years 1963 and 1973.

The number of farms has increased during the ten years between the censuses by 0.19 percent, which is very little. During the same period, the number of farms in the entire country has increased by 26.2 percent. Consequently, the relative increase of farms in the region as compared to that in the entire country has been negative if measured by the following indicator.

Table 3.11 Number of Farms and Total Agricultural Area, Pacifico Central; Region 2, Costa Rica

Province / Canton \ Year	Number of Farms 1963	Number of Farms 1973	Proportional Change	Total Agricultural Area (ha) 1963	Total Agricultural Area (ha) 1973	Proportional Change
San Jose						
Turrubares	573	795	(+1.387)	29,688	11,614	(-0.391)
Alajuela						
San Mateo	324	393	(+1.212)	11,444	12,621	(+1.102)
Orotina	255	522	(+2.047)	34,234	42,719	(+1.247)
Puntarenas						
Central	3,073	2,918	(-0.949)	150,396	167,696	(+1.115)
Montes de Oro	506	576	(+1.138)	22,286	23,823	(+1.068)
Esparta	520	580	(+1.115)	17,349	16,344	(-0.942)
Aguirre	1,464 (inc. Parrita)	816 (Total 1,739)	(+1.187)	67,729	44,905 (Total 78,511)	(+1.158)
Parrita		923			33,606	
Total	6,715	6,723	(+1.0019)	333,126	353,328	(+1.0606)
S		-1,751			-36,756	
Y		-0.26			-0.110	
Costa Rica	R = 1.262			R = 1.1709		

$$S = X_{j73} - \frac{X_{73}}{X_{63}} \cdot X_{j63} ,$$

where X_{73} and X_{63} respectively refer to the measures for the entire country in 1973 and 1963, and X_{j73} and X_{j63} refer respectively to the corresponding measures for the region j which is, in this case, the Pacifico Central for the years 1973 and 1963.

S, thus calculated, is sometimes referred to as the "Total Shift" measure. It indicates nothing but the difference between the actual magnitude of a region's characteristics in 1973 and the corresponding magnitude for the characteristics which would have been obtained if the region's characteristics had changed at the same rate as the change for the nation as a whole.

The total shift of the number of farms in this region was -1,751, i.e., the amount less than the national increase.

By transforming the total shift measure,

$$\gamma = \frac{X_{j73}}{X_{j63}} - \frac{X_{73}}{X_{63}} = \frac{S}{X_{j63}}$$

is obtained. This γ may be considered to be the relative shift of the region, being simply the difference between the region's change and the change of the national total.

This γ for the number of farms in the region is -0.26.

The analytical meaning of these measures will be examined later. Here, however, the same measures for the farm area of the region are obtained respectively:

$S = -36,756$ ha

$\gamma = -0.11$.

For this region, therefore, both the number of farms and their areas relatively declined as compared to the nation as a whole during ten inter-censal years.

Using the same method, all provinces of the country may be analyzed to obtain some ideas on the shift which has taken place between 1963 and 1973. (See Table 3.12, change in the Number of Farms and in the Total Farm Area for All Provinces.)

A positive shift in both the number of farms and farm area is seen in the case of Alajuela and Puntarenas. While Cartago and Heredia show a positive change in the number of farms but a negative one for farm area, an opposite change is seen in Guanacaste and Limon. In San Jose negative shifts in both measures have taken place.

It is possible to infer from this that concentration has taken place in Alajuela and Puntarenas, but that San Jose has become less agricultural. In Cartago and Heredia the relative average size of a farm was reduced while it has increased in Guanacaste and Limon.

It should, however, be remembered that the definition of the Provinces is strictly administrative and it does not refer to any significant autonomous character of any economic nature that homogeneously characterizes a region.

For the corresponding period, the population of the region has shifted and, measured in $\underline{S}$ and $\underline{\gamma}$, yields the values of -23,136 and -0.22, respectively.

Table 3.12 Change in the Number of Farms and in the Total Farm Area for All Provinces

Province	Total Number of Farms 1963	1973	S/	Total Area (Hectare) 1963	1973	S/
Costa Rica	64,621	81,562		2,666,528	3,122,456	
San Jose	15,262	19,009	-254	309,607	321,691	-40,854
Alajuela	15,180	19,510	+351	563,515	684,187	+24,321
Cartago	5,095	7,734	+1,302	154,228	147,673	-32,925
Heredia	3,088	4,437	+539	154,958	135,127	-43,326
Guanacaste	10,773	11,835	-1,762	775,286	908,674	+829
Puntarenas	9,941	13,747	+1,200	508,059	680,572	+85,643
Limon	5,281	5,290	-1,375	207,863	244,530	+1,126

Particularly the rural population declined relatively by $S = -14,005$ and $\gamma = -0.18$; urban population increased by $S = 5,587$ and $\gamma = 0.20$, respectively, as indicated in the following tables. (See Table 3.13. Population 1963 and 1973 Pacific Central Region.)

The relative changes so far dealt with for the region of Pacifico Central can now be compared below:

Total number farms	-0.26
Total farm area	-0.11
Total population	-0.22
Rural population	-0.18
Urban population	+0.20