REPORT FROM THE ROUND TABLE OF THE
SECOND REGULAR MEETING OF THE
INTER-AMERICAN BOARD OF AGRICULTURE

Kingston, Jamaica
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A REPORT ON THE STATE OF AGRICULTURE AND RURAL DEVELOPMENT IN LATIN AMERICA AND THE CARIBBEAN

IICA

INTER-AMERICAN INSTITUTE FOR COOPERATION ON AGRICULTURE
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ROUND TABLE

EXAMINATION OF THE STATUS OF AGRICULTURE AND RURAL DEVELOPMENT IN LATIN AMERICA AND THE CARIBBEAN

Jamaica, October 28, 1983

INTRODUCTION

INTRODUCTION BY THE EDITORS

This document contains presentations made during a Round Table on the subject "Examination of the Status of Agriculture and Rural Development in Latin America and the Caribbean." This Round Table was organized by the Directorate of Analysis and Evaluation of the Inter-American Institute for Cooperation on Agriculture, and held on the final day of the Second Regular Meeting of the Inter-American Board of Agriculture, which took place in Kingston, Jamaica from October 24 through 28, 1983.

A base document was prepared for the Round Table, to summarize the most striking structural characteristics of the present status and patterns of change in the countries of the region. Another major objective was to provide a condensed informal basis for discussion, using available data.

The final goal of the base document and of the Round Table itself was to lay a more permanent organizational, methodological, and informational foundation for conducting studies and discussions of this nature in the future.

In the Round Table, the present status of agriculture and rural development in Latin America and the Caribbean were presented and discussed. This provided IICA's member countries an opportunity to reiterate their interest in proposed development models that allow agriculture to play a more important role than in the recent past.

Participants representing IICA at the Round Table were the Director General, Dr. Francisco Morillo, who served as moderator; Mr. Rodolfo Martínez Ferraté, Director of Analysis and Evaluation; and Dr. Mario Kaminsky, Head of the Division of Analysis and Studies. Other speakers, for whose invaluable contributions we are grateful, were renowned experts from many countries: Dr. Jaime Lamo de Espinoza, from Spain; Mrs. Dorel Callender, from Jamaica; Dr. José Emílio Araujo Gonçalves, from Brazil; Mr. Luis Paz, from Peru; and Mr. Roberto Villeda Toledo form Honduras. These people have a broad understanding of the problems of the rural sector, and their comments were valuable in the discussion which followed the presentation. Also present were representatives of the Member States of the Inter-American Board of Agriculture.

This publication contains the original base document and the formal papers presented by the experts. It also includes comments made by IICA staff members and Ministers of Agriculture who were present.

The hope of the editors is that the dissemination of the ideas and experiences contained in this report will contribute to today's discussion of the present state of agriculture and of the alternatives for a new development style. Under the particular conditions in each different country, such a development approach should make it possible to improve the standard of living of rural populations in Latin America.

It is a great pleasure for IICA to present this report as an accurate reflection of the discussion that took place during the Round Table and the conclusions that were reached.

The Editors

PART ONE

INTRODUCTION BY DR. FRANCISCO MORILLO ANDRADE

DIRECTOR GENERAL OF IICA

This Round Table on the "Examination of the Status of Agriculture and Rural Development in Latin America and the Caribbean" is a special feature of the Second Regular Meeting of the Inter-American Board of Agriculture. It is being held in compliance with the mandates of IICA's Rules of Procedure, which call for an analysis of the status of the agricultural sector in our Member States, to be presented during the Board meetings. Our study covers those Member States which are included in the geographic region known as Latin America and the Caribbean.

At this Round Table we will benefit from the valuable cooperation, participation and contributions of Mrs. Dorell Callender, of the Organization of American States. Mrs. Callender is from Jamaica, an economist by profession, and presently works as an advisor to the Executive Secretary of the Inter-American Economic and Social Council, responsible for coordinating all CIES assistance to the Caribbean area.

The second speaker will be Mr. Luis Paz Silva, an agriculture economist, President of the Peruvian National Development Foundation. He is associated with the National Agrarian University in Peru, and has served as General Manager of the Peruvian National Food Agency and Director General of Agrarian Planning.

Another speaker will be Mr. Roberto Villeda Toledo, from Honduras. He is an advisor to the Minister of Natural Resources of Honduras, where he has also served as Director General of Agriculture and Livestock and Executive Secretary of the National Agricultural Policy Commission.

The base document prepared by the Inter-American Institute for Cooperation on Agriculture will be presented by Mr. Rodolfo Martínez Ferraté, from Guatemala, IICA's Director of Analysis and Evaluation, and Dr. Mario Kaminsky, from Argentina, who is Head of the Division of Analysis and Studies in the same Directorate.

We have asked two distinguished experts who are with us today to share their impressions and opinions about the findings of the document and the ideas that the speakers will be expounding. They have been kind enough to accept our invitation, so I will introduce them at this time: Mr. Jaime Lamo de Espinoza, agronomist, engineer, and economist, is a tenured professor in the Department on Agrarian Economics at the Polytechnic University of Madrid, where he also served as Minister of Agriculture of Spain from 1978 through 1982. In addition, he chaired the Twentieth FAO Conference and the Conference of Ministers of Agriculture of the Organization for Economic Cooperation and Development. Dr. Lamo de Espinoza is a great friend to IICA and to Latin America, and from his different posts has always promoted efforts by his country and by Europe as a whole to cooperate with our continent.

Finally, we are deeply honored to have Dr. José Emílio Gonçalves Araujo

as a commentator. Of course, he needs no introduction. He is the winner of the Inter-American Agricultural Medal for 1983, awarded by the Board during this same meeting. Dr. Araujo has always been generous with his wealth of experience and knowledge as a teacher and in his twelve years as Director General of IICA. He is now President of Pelotas Federal University in Brazil.

Our hope is that the base document developed by the Institute for distribution among the participants here, as well as the presentations by the guest speakers, will provide an effective point of departure for discussion. We are interested in hearing the comments of all the distinguished representatives of the Member States of the Inter-American Board of Agriculture who are here with us today.

INTRODUCTION TO THE WORKING DOCUMENT BY MARIO KAMINSKY,

HEAD, DIVISION OF STUDIES AND ANALYSIS

Our original intention was to give a brief, systematic summary introducing some of the findings and ideas included in the document which has been distributed. However, the time available is limited, as this is the final day of the Board meeting and some of the delegates will soon be traveling. Therefore, we will be obliged to omit the systematic presentation, and as much as possible, I will merely touch on some of the salient points highlighted in the summaries of the various sections of the working document, with special emphasis on the general summary and conclusions at the end of the paper.

First I would like to make comments concerning the present state of the region as a whole, that is, comprehensively or as an aggregate, and changes which have taken place very recently. The easiest way to summarize the most immediate situation, essentially 1981, 1982, and the first half of 1983, is to make very clear that the general conditions being confronted by the region known as Latin America and the Caribbean have origins that spanned the previous decade. In particular, conditions grew steadily worse throughout the second half of the seventies, and the crisis had become universal by 1981, 1982, and the early months of 1983. Nor have the agricultural sectors in the countries of the region been spared. The crisis has ushered in a recessionary period with extreme, acute external indebtedness and considerable deterioration of conditions in the external sector of all our countries.

Four fundamental issues must be subject to special scrutiny. The first is the changing course of production in the aggregate, generally revealed by indicators of gross domestic product and aggregate value of the agricultural sector. As was noted, this sector suffered considerable decline throughout the previous decade, especially during the past five years, and the deterioration became acute in more recent years. For example, in 1982, the gross domestic product registered an absolute loss in value, and the aggregate value of the agricultural sector experienced no growth. Nearly every country of the region experienced these declines, and the indicators of countries with zero or negative growth climbed from 1981 to 1982. Today every country in the region is included in these discouraging figures.

The most commonly used indicator to illustrate growth is gross domestic product per capita. In the year 1982, this indicator was negative, as was aggregate value of the agricultural sector.

At the same time that production was subject to these recessionary pressures, external indebtedness was growing acute during the second half of the previous decade. The situation assumed truly dramatic proportions

in recent years, and continues today, in 1983. No country in the region has escaped this debt burden.

It has been said time and again that the countries of the region are exceedingly heterogeneous, as this paper illustrates. As a result, it has proven necessary to form relatively homogeneous groups of countries. It is a tactic that serves various purposes, both methodological, and with extensive practical repercussions. It enhances the design of policies tailored to specific groups of countries or types of countries, according to their problems, their present conditions, and their changing patterns or dynamics over time. In the case of indebtedness, this heterogeneity is particularly marked. It is well known that the process of acute external indebtedness has concentrated in a few countries, even though overall indebtedness is a growing problem in most or all of the countries of the region. It should not be forgotten that indebtedness is also concentrated on the other side of the ledger, in a small number of lending banks and countries.

Indebtedness has reached levels that would have been impossible to foresee and that are simply difficult to believe. We are facing a total of about 300 billion to 350 billion dollars that the region owes to other countries, and the figure is shocking. During the past decade, the level of foreign debt has multiplied at least eightfold, and it is quite possible that by now the swelling foreign debt bills may have multiplied tenfold over the past ten or twelve years, reaching levels of 350 billion dollars. Such indebtedness has serious consequences, significant not just in theory, but more importantly, in unpaid bills. This brings with it additional related consequences, including the so-called debt service, with payments of principal and interest, which seriously compromise payment capacity in financial terms for too many countries in the region.

Interest is an important component of the debt service burden. Over the previous decade, interest doubled in real terms, while public debt soared to as much as fifteen percent or more per year. Only ten years ago, average interest rates hovered around six to seven percent. The base document discusses the issue of debt service payments and gives several indicators of how serious the situation has grown. We will not take time to examine the section in depth, but it is worth noting that the document illustrates extreme levels of debt service which "commit" or tie up massive amounts of the gross domestic product, or total production by our economies. Another commonly used measurement is the amount of potential export income that is "committed." Figures show that one-half of export income is committed for paying the debt service. This level doubles and even quadruples if we compare total product with foreign debt payments.

The payment of debt services, as I stated, has another implication. No amount of dramatic change in the indicators of real income equivalent, or real equivalent of total gross domestic product, or even aggregate value of the agricultural sector, can be used to pay external bills. Debts must be paid with money. They must be paid with foreign exchange. The foreign currencies used for exchange, the freely convertible currencies, generally derive from exports. This is why such staggering levels of exports are "committed" for the payment of debt service. Consequently, we are

now beginning to look to the agricultural sector to rescue our countries from the serious crisis situation in which they are immersed. In an economic structure such as that of the different countries of Latin America and the Caribbean, where agricultural exports provide most, if not all, of the export income, it is natural to think of the agricultural sector as the generator of foreign exchange. It has always played this role in our economy; but today's critical situation makes it even more crucial.

We have recently discovered that loans from outside are not even bringing in enough money to pay interest on our foreign debts. At the same time, the flow of loans from outside is drying up through an aggressive process of loan contraction. In recent years, loan volume has tumbled to one-half or one-third of previous levels, and as a result, the new borrowings in 1982 were not enough to pay even half of the interest that our countries have accumulated.

We are confronted with an additional dilemma related to the world recessionary picture, particularly in our own countries. We know that total export value is simply the product of export volume multiplied by prices; there are two essential factors involved. A look at export volume alone reveals a perfectly acceptable performance by the countries in Latin America and the Caribbean. Exports show sustained growth in association with a steady rise in the level of international transactions between the countries of this region and countries in other regions. However, this accentuated growth in physical exports is much more than offset by price reductions. This is a well-known fact, which the working document illustrates in indicators on declining terms of foreign trade and, in particular, on the prices for basic commodities, raw materials, and agricultural commodities. We will not take time to review the data, but the price falls have been dramatic over the past ten years, with particular activity in the last two years of recession.

This leads to frustration as the countries produce more and more, export more and more, and earn less and less, in real terms. Foreign exchange resources grow scarcer, insufficient to meet commitments. Imports have also grown, especially food imports, which have soared in recent times, and caused considerable concern to our countries. Far from swelling national coffers, expanded export efforts produce ever lower amounts of real income, and frustration grows. This is why it is so important to redefine the role of the agricultural sector at this point in time.

The working document includes our suggestion that a high level technical meeting be held in 1984 to dicuss the subject of agriculture in today's crisis. Such a meeting would be based on the deliberations, presentations, discussions, and papers in this round table, and the document that we have been preparing for some time. It may prove necessary to rethink the functions of agriculture in our region and assign new roles to this sector, according to the different types of countries, either by altering present roles or by maintaining some of those that already exist. The base documents of the Inter-American Institute for Cooperation on Agriculture have already taken cognizance of this need to change the roles of the agricultural sector in our countries.

The leit motif throughout the preparation of the paper you have received

was the recognition of the extreme heterogeneity among our countries. In this context, an effort was made to attempt to group countries together according to homogeneous characteristics they shared; recurring types of countries could then be identified and validated. At the same time, a parallel analysis was based on a more common system for partitioning the countries: division by geographic areas, based on the geographic areas of the Institute itself.

The foundation of the working document was the hypothesis of heterogeneity. This tremendous heterogeneity was tested with the use of the indicators described in the paper. The task involved one hundred simple and synthetic indicators of two basic descriptive approaches: the present state, measured at the end of the past decade or the beginning of this decade, and change over time during this decade.

Three general subject areas were selected for emphasis in the paper. The first is food and food security, which is a vital economic and political issue. The second is the external sector, which showed undeniable deterioration in our countries. The third area, employment and agricultural income, was also dramatic. In all three areas, the effort was to emphasize, as much as possible, the relationship between the agricultural sector and rural development, and general indicators of overall progress by our economies.

The analysis was partially disaggregated in order to identify and validate country types in terms of both present state and change or dynamics over time. Geographic divisions were also included, as has been mentioned.

The comprehensive analysis examined Latin America and the Caribbean as a whole. It was then possible to determine whether the disaggregated studies confirmed all the features or characteristics deriving from the comprehensive approach. With this comparative study, some of the severe constraints being imposed on the countries and the region as a whole were found to assume truly dramatic proportions when partitioned into subgroups of countries. As an example, certain groups were discovered to be in an extremely serious situation in terms of the indicators of food and food security and income, employment, and agriculture as a whole. Nevertheless, they were much healthier in terms of the external sector. Another group, however, was in exactly the reverse situation, registering adequate levels of indicators of food security and employment, income and agriculture as a whole, but revealing an extremely fragile external sector. Finally, there was a third group of countries in which all three areas were found to be in relatively good condition at present.

This distinction must not be overlooked. Many of the policies that have surfaced recently, both in general terms and in the field of food security, are based on problems stemming from basic and agricultural commodity prices and protectionist measures. Because these general policies are being imposed by relatively more developed industrialized countries, international gatherings have begun to focus increasingly on a strategy centered on our own region. It is an inward looking approach that, instead of avoiding the use of international trade schemes, with their undeniable benefits, seeks new ways to make our comparative advantage work for us. We have realized that there are certain types of countries that would complement each other because of their dovetailing present conditions and changing circumstances in recent years. We find certain

conditions emerging that may facilitate the implementation of more active programs for integration and exchange, especially in the fields of agriculture, food and food security.

This type of initiative has been proposed in numerous international gatherings, and the base document reflects it in several ways. In particular, IICA, together with the Organization of American States, agreed in April to work toward expanding interregional trade.

Today's situation is highly dramatic in many ways. As one example, in the field of food and food security, we are told that existing problems are associated with production and the productive sectors; however, a number of indications show instead that this is really a problem of consumption, associated with rural and urban poverty. Consequently, it is closely connected with the level of purchasing power of large population groups.

We also find relatively anomalous or idiosyncratic situations. The one group of countries most severely affected by problems of food and food security, the external sector, and employment, income and agriculture as a whole, is also the very group that registered a fierce expansion in the indicator of total volume of cereals being used to feed livestock. While the magnitude of this indicator is considerable, even more striking is the fact that in the last ten to twelve years, its proportion has exploded. The literature contains references to this problem of competition between livestock and people. In fact, it is a competition that neatly masks another problem. Livestock is competing with people, but ultimately, the true competition is between different human groups with radically different income levels.

The same countries that register relatively more acute difficulties in general also have a high ratio of agricultural exports to agricultural imports. In another group of countries, faced with severely deteriorated conditions, this indicator is on the rise, and all this suggests that the field of food and food security is experiencing considerable contraction of demand or consumption, associated with productive structures that are not necessarily well adapted to the real conditions of the large population masses in our countries.

There is another important idea that deserves mention. All indications, especially in recent years, remind us never to lose sight of the general and overall objectives of developing our economies and our populations. While it is true that we are subject to heavy pressure to innovate emergency solutions to problems as they arise, we must never allow these pressures to blind us to the need for basic policy change. The generation of policy, particularly agricultural policies, must be recast, as much as possible, to shape the role of the agricultural sectors in our different types of countries to present circumstances without forgetting longer term objectives. In this sense, the working document closes with the recommendation, and here I will read from the paper, that "...while today's pressing issues are problems which must be recognized and addressed, they must never cloud our long-term view, the development approach which should predominate. The characteristics and problems of the different types of countries in Latin America and the Caribbean examined herein are eloquent evidence of the need for appropriate measures and decisions. This Round Table of the Second Regular Meeting of the Inter-American Board of Agriculture opens the doors for discussion of alternatives so that the adjustments

which are forthcoming may be designed and implemented so as not to interfere with the attainment of the objectives or basic ends which the Member States laid down in the Convention on the Inter-American Institute for Cooperation on Agriculture and which they all continue to maintain today.

COMMENTS BY RODOLFO MARTINEZ FERRATE

IICA DIRECTOR OF ANALYSIS AND EVALUATION

Time constraints oblige me to limit myself to just a few thoughts that may aid in the discussion and in the exchange of experiences at this forum. We hope that this will be the first step in a new effort that will culminate in a high level technical meeting by the end of 1984, as stated in the base document.

In the first place, the analysis of data and indicators underscores the heterogeneity of the countries of Latin America and the Caribbean. We find not only heterogeneity, but also divergence, separation, and isolation among countries, despite the fact that this region grew from a single cultural tradition and has a community of shared interests. It is worthwhile to discuss and meditate on how to begin increasing exchange and reciprocal cooperation among our countries, not only in the form of exchange and barter as discussed in the document, but also through a complementary food production plan. The ultimate goal would be to attain self-sufficiency and respond to the needs of our own people. The data show that Latin America as a whole should not have problems of food supply, and for this reason, it should not be difficult for the region to supply its own needs.

This heterogeneity is also very visible in the exchange of technical experience, systems and methodologies, in which countries are highly varied. Some have much to offer. As an example, IICA has begun working in Central America and the Dominican Republic with the Regional Council for Agricultural Cooperation, introducing the concept of a "Single Public Agricultural Sector" in the seven countries of the region. Technical experts can be shared among them through the common fund provided by the countries themselves.

Despite political crisis, the council is working. Technical people are transferred without delay from one country to another at the request of a Minister or other officer in need of high level technical assistance available in a neighboring country. This optimizes the use of all the resources in the region. Here we have two examples of South-South regional cooperation that merit considerable reflection for the future.

The crisis has introduced another important factor which was not clearly visible until now. In the past it was quoted as a hypothesis, but today it has become indisputable: at the beginning of the century many countries in Latin America copied or adapted systems and methods for education, extension and agricultural technology transfer from developed countries, leaving intact the exogenous objectives, structures, and labor systems. In 1963, Samuelson was already criticizing this approach to economics, pointing out that the economistic approach which had prevailed in the developed world was being transferred to underdeveloped countries. In fact, this approach was successful as used in education, extension, and agricultural development among the best educated population groups, including medium-scale and large farmers.

However, successful technology transfer within this particular segment of the farming population masked the problems of small-scale farmers. We began to think that all development problems could be solved little by little if we simply extended these successful systems to the smallholder stratum. I think it is high time we lay this expectation to rest, once and for all. Small-scale producers need a special approach, and many people, countries and international institutions are actively working toward it.

Small-scale producers are still very important. For example, in one of IICA's regions, small-scale peasant farmers produce fifty percent of all consumer foodstuffs and twenty-six percent of export material. These small-scale producers are defined as campesinos who own less than twenty hectares of land. They make up the poorest group, and it is growing poorer. We have the example of a country in this region which in 1977 held third place for all of Latin America in terms of quality of life. Only twenty-four percent of the population was considered poor, using standard IDB indicators. By 1982, scarcely five years later, fully seventy-one percent of the population had moved into the low income groups reflecting the direct and very strong impact of today's crisis. This low income sector, and especially the small-scale producer, require a special approach.

Problems with external indebtedness also suggest a new approach. Part of the external debt grew out of the great infrastructure projects and the industrialization emphasized in past decades. The management of these large projects has been carefully studied, and the problems identified have been significant. Let us recall that the benefits of these ventures accrued not only to the creditor countries, but also to the developed countries and the international economy, through the purchases and acquisitions made with loans. The large project approach cannot be pursued indiscriminately because it brings high levels of external indebtedness. We now need to discuss a new approach, channeled toward small-scale development projects, and for this we need new methodologies. In fact, development theory has a serious blind-spot if we look for a model based on small production projects designed for small-scale industrial or agricultural producers.

The small production project approach is a tool that will be very important for the future and it will clearly be directed toward smallholders. However, the emphasis is not on individuals, as it is very difficult to work individually with small-scale farmers. Instead, it must provide support for organized groups, solidarity groups, farmer organizations, associative enterprises, cooperative enterprises, and different associative types of production. Private and public associations have begun to crop up in every country, working with solidarity groups that use small projects as the pivot for their own development.

Another issue which emerges from the study is the balance of payments deficit and the shrinking foreign exchange reserve. One feature of this problem cannot be measured, even though it is a part of the heavy drain of reserves. This is the outflow of capital caused by insecurity and political problems in Latin America in the present time.

IICA is a technical institution. Nevertheless, we cannot ignore the economic, political and social crises which produce a vicious circle difficult to break. A recovery is now being heralded in the economy of the

Western world. It should bring us the opportunity to break the vicious circle and to move swiftly so that the benefits of the upswing will be better distributed. Studies of peverty groups and high income strata have shown a tremendous polarization in recent years, with all the instability that implies. A number of authors and institutions have discussed the possibility of improvement in the international economy and commerce, and they have begun to recognize that the developed countries, including the United States, will need to increase food imports. I believe this is a good time for Latin America to prepare itself to meet the opportunity of rising demand for agricultural produce and primary products. This, however, is the crux of the problem. It is not enough simply to increase exports, a task for which the productive structure in Latin American countries is well equipped. What is truly essential is to fetch better prices on the international market, which in the past has been governed not only by the forces of supply and demand, but by protectionist measures in some developed countries. We cannot forget that food producers in Latin America, many of whom are small-scale farmers, are subsidizing the cities and other sectors of the economy, and frequently lack political power and access to pressure mechanisms. By contrast, farmers in the European Common Market and other countries receive price subsidies as a form of incentive.

Let us take another look at the problem of food and low consumption, which has traditionally centered on production. It is time to acknowledge that the problem is not production, but rather poverty and purchasing power. Even countries with production problems have adopted structures that allow for an unfettered supply. For example, one oil producing country imports US$19.00 of foodstuffs for every dollar earned through agricultural exports. The drawback is food for the poor sectors. The solution lies in developing comprehensive national policies to deal with the problem, and guaranteeing the public agricultural sector an important role in improving the life of small-scale farmers. This involves wage improvements, wage policies, job creation, income redistribution, and land redistribution.

Latin America has greater potential for production increases than any other region of the world. The Latin American tropics contain seventy-nine percent of the continent's potentially usable new areas and most of the land with future production potential. This is particularly true for the humid tropics, where malaria, yellow fever and other diseases have generally ceased to be a threat. For example, two-thirds of the total territory of Central America is located in the northern part of the isthmus, an area that is underpopulated but has high potential as a humid tropical zone. In the Amazon, ten million square kilometers of land have development potential, but appropriate technology is not available. This tropical zone is considered one of the world's most productive regions, in terms of annual yield. While we cannot even compare a corn harvest from the tropics to one from Iowa or Chile, the tropical zones produce three harvests per year. In combination, these three harvests produce more than a single grain harvest from the northern hemisphere. Another example is edible oils, which produce some of the greatest deficits in Latin America. The African palm produces four times as much oil per hectare as soybeans, provides comparative advantages, and together with cacao and rubber, is one of the most promising products for the humid tropics. For these reasons, the development of these tropical lands deserves serious consideration. Let us not forget that IICA, and especially CATIE, are the world's two most knowledgeable institutions in this field.

I would like to close by pointing out that the public agricultural sectors are confronting a multi-faceted challenge. It can be met only if structures are changed from within. Working mechanisms have grown considerably, but their growth has been chaotic. This is why our countries must begin a process of realignment so as to comply with their obligation to provide incentives for maintaining the food supply for their populations, creating jobs in rural areas to absorb labor, and finally increasing exports. If international prices improve, this last category alone will help considerably to solve the balance of payments problems and pay the debt service. This will open the door to new alternatives to a debt moratorium or readjustment, as has been suggested by some countries.

I have shared these ideas with you in order to stimulate discussion of the need for a new development model which would assign the agricultural sector the proper role that it must play at this historical juncture. It is essential for the Ministries of Agriculture to take the lead in this new approach.

AGRICULTURAL COOPERATION IN THE INTER-AMERICAN SYSTEM

DOREL CALLENDER

Born in Jamaica. University studies in the University of Toronto, Canada, receiving the B.A. degree with honors (1959) in Economics and Political Science and the M.A. (1962) in Economics.

Has held important positions in the Organization of American States as technical consultant of the Economic and Social Council and Head Economist for the Inter-American Council of the Alliance for Progress. In the Inter-American Development Bank, served as alternate Director for Mexico, Panama, the Dominican Republic and Jamaica. In Jamaica, served as Vice-Minister for Economic Affairs of the Ministry of Foreign Affairs. Also served as Director of Special Research Projects and Surveys of the Ministry of Economic Affairs and Development for the Canadian Government in Ontario.

Author of several specialized articles on economic subjects.

There is little doubt that questions concerning the balance of payments, food and employment are today at the center of our countries' development efforts. At the Organization of American States, we have no doubt that these development problems are, and will continue to be dominant issues at the national, subregional and regional levels. National policies to pursue these objectives and multilateral trade, financial and technical cooperation agreements to support these policies will continue to be on the agendas and in the forums of the Inter-American System for some time to come. The Organization therefore welcomes the opportunity to participate in this Round Table on agriculture.

Agriculture occupies a significant part of the Region's economic activity since it accounts for eleven percent of the total value added in the region and over thirty-five percent of total foreign currency earnings. The representatives of the Inter-American System have long been interested in the matter of food, and their concern is easy to explain. Development in the broadest, most fundamental sense is, in the first instance, the effort to satisfy basic human needs. Sufficient food and an adequate diet is the most basic of all human needs. Better nutrition is not just an instrument to achieve development; it is the very essence of development because it aims directly at survival and raising the quality of human life. Better nutrition cannot be neglected in pursuing the ideal of integrated development, and in the end, it must form a basis for the cooperative efforts of our countries. The success of our political-economic systems is best measured by the quality of the food on the poorest family's plate. Measured

in these terms, one cannot help but be reminded of the difficult task which agriculture faces in our countries. We do not face this task with confidence or assurance. We are distracted by talk of food as a weapon. Such talk is not only dangerous, but discouraging as well, because the impact of hunger does not fall on rival policy makers or competing governments--it falls on those who have neither grain nor gas nor gold. It is the poor, particularly the children, who will bear the brunt of such a policy. We are also distracted by the so-called failures of agriculture, particularly in the public agricultural sector.

I am certain you will agree that such distractions and pessimism are unwarranted and counterproductive. Let us therefore look to concrete suggestions for solutions and begin our constructive analysis here at this Round Table. Conferences and international forums, national plans and political statements from both within and outside the Inter-American System continue to give high priority to policies and measures to resolve problems of growing malnutrition and food trade deficits. Both the UN and the OAS have sponsored gatherings to study the varied aspects of Latin American food problems. In Mexico City in February, the World Food Council examined National Food Strategies, and in Santiago, Chile, the Eighth Inter-American Conference on Agriculture was held in April, 1981.

It is the consensus of OAS member countries, stated in repeated OAS resolutions and forums and in national plans, that agriculture must serve social and economic development objectives. The recurring goals are to achieve a more equitable sharing of the benefits of development, among nations and among their people. These objectives are best stated as agricultural production growth with equity.

These objectives really mean that the agricultural sector is expected to play a major role in each country's economic development. Agriculture has traditionally been expected to:

i. create jobs to absorb the normal increase in the labor force in productive ways;

ii. correct existing nutritional deficiencies, while also resolving the problem of rural unemployment and poverty; and

iii. ensure adequate levels of nutrition for increased populations.

However, the energy crisis which has ravaged our economies has lengthened the list of expectations from the agricultural sector. The continuing economic crisis has led to falling export earnings, balance of payments crises and the increased burden of external debts, and this means that the agricultural sector is now being called upon to play a larger and more immediate role as a generator of foreign exchange. The agricultural sector has thus been assigned the formidable, three-fold task of meeting our country's social welfare needs for nutrition and food, providing employment and helping to solve the balance of payments crisis.

Let us look briefly at the characteristics and trends of Latin American and Caribbean agriculture and examine some of the pertinent aspects of the agricultural scene. Let us see how suited it is to meet the new challenge of the 1980's.

First, we should review the general characteristics of agriculture in the region. The consensus is that the region as a whole is well equipped to meet these three-faceted problems of the 1980's. Although individual country situations vary, the region has the potential to meet its food needs. A review of the statistical data of recent years shows an adequate overall expansion of food in the region, since food production has been keeping pace with population growth. However, the statistics for some countries reflect a noticeable deterioration in the per capita food production index. Moreover, a number of countries are clearly below their 1969-71 agricultural production levels for this index. This is particularly so in Central America and in the Andean and Caribbean subregions. Eight countries in these two subregions actually fell below their 1969-71 levels by more than ten percent. The USDA considers that eight countries in the region will need food aid if they are to reach satisfactory nutritional standards, given their projected limited capacity to import in commercial terms. Even this estimate might be overly optimistic, since the agricultural potential of the region and the favorable trend towards overall adequate performance in food supply are not shared equally among countries. Land quality, food availability, and production performance are highly uneven among Latin American and Caribbean nations.

Food and nutritional deficits and the increasing malnutrition in urban and rural areas are a consequence of the low purchasing power of a sizable share of the populations of Latin America and the Caribbean. The nutritional problem results from the way income is distributed--the need for food often fails to be translated into an effective market demand.

In employment, we know that some 120 million persons are currently underemployed or unemployed in the region. Although figures are unreliable, in the Caribbean economies, the unemployment rate is often as high as 25 or 30 percent of the work force. The serious unemployment problem of Latin America and the Caribbean has been further heightened by a three percent annual rate of growth in the work force. In light of the current gloomy projection for private sector growth, it is difficult to project that either agriculture or industry will be able to absorb the current pool of unemployed, let alone the new workers.

It would not be difficult to conclude that all too often, our countries are actually moving farther away from their stated social welfare goals; at the same time, they are facing serious problems in the area of employment generation.

Let us now look at the situation of the foreign debt and the balance of payments. The current recession has reduced the volume of exports and severely impaired the terms of trade. The value of exports, which averaged nineteen percent a year between 1970 and 1981, dropped ten percent in 1982.

The current account deficit of the past four years totalled $119 billion and the net loss of international reserves for 1982 alone was $14 billion. It is not surprising that the aggregate debt climbed to $20 billion from 1974 to 1979 and now stands at over $300 billion.

It is generally agreed that balance of payments crises and rising debt burdens mean that the export sectors of Latin America and the Caribbean, including agriculture, must be called upon to assume a larger role as generato of foreign exchange. The search must now intensify for new and better ways to develop agriculture, to bring about more rapid growth of food supplies for domestic consumption and for export. There are numerous suggestions. Let me discuss two aspects of the many variables which might form part of the future agricultural picture. What should be the role of the private sector and the public sector in agriculture? How can the public and private sectors provide new ways of dealing with agriculture in the future?

There are numerous striking examples of the success and effectiveness of private sector action. Private companies and their initiatives in such countries as Brazil, Peru, Paraguay, Costa Rica and Honduras have demonstrated the power of the private sector to increase production dramatically and to increase a country's foreign exchange. There is little doubt about the continued strong role of the private sector. There also seems to be little doubt that under present policies, the public sector as currently organized is unable to undertake the task of increasing production, nor is it able to discipline or orient the private sector towards an acceptable balance of growth with social justice and equity.

In light of these realities, what seems to be needed is a fusion of the roles of the private sector and public sector into a single whole in which they can complement one another, united towards the single goal of feeding the nations. The countries' policies of equity and justice must be balanced with growth policies and food security, and with balance of payments needs. This approach to joint private and public sector action is not new, although in the past, little attention was paid to the enormous support that efforts had received from the public sector. Investment in infrastructure has been significant, and institutional support takes the form of creating and facilitating foreign trade arrangements among respective governments. This policy of joint private and public sector policy requires a strong, well-financed public sector with an unwavering commitment to structure policies for increasing food staples, reconciling this with other national goals such as employment and export earnings.

The underlying role of public sector policies should be the formulation of a national food plan, the overriding purpose of which should be to tailor food production goals to food needs, and to determine job and income requirements. In essence, the plan should determine the products to be produced and the quantities necessary in order to meet the population's food needs, describe the type of farming mechanisms required for the production of these foods, and specify technological guidelines on how food should be produced. The emphasis of this national policy should be on resources that are available in the country, and policy makers should be prepared to ask for a new definition of the notion of productive efficiency, to make it relevant to conditions within each country of the region. Once these key aspects--objectives, goals and policy instruments--are defined, the programs and projects for investment, financing and technical cooperation will follow.

While a national food plan must determine optimum levels of food self-sufficiency, particularly of basic staple self-sufficiency, the plan must be supported by supplementary supplies and imports from outside sources. As a basic regional strategy to meet these requirements, it is proposed that the countries begin by looking inside our own region.

A strengthened public sector and a national food plan can yield results only in the presence of a healthy private sector which operates with strong support from the public sector. In addition, shared or cooperative efforts are needed in those areas which require public and private cooperation such as credit, and in chronic problem areas such as rural poverty and urban slums.

It is my belief that only when the countries of Latin America are able to meet and solve the problems of agriculture at the country level will our countries obtain access to the full opportunities which might be derived from wider sub-regional and regional self-sufficiency in food.

The second step will be agreement to cooperate on a regional basis to achieve food self-sufficiency throughout the hemisphere. The Inter-American System has always upheld the principle that every country is free to choose the approach it will take. Each one will have to decide how self-sufficient it wishes to become, taking into consideration its available productive resources and the means proposed to reach the goal.

Once the countries have defined their objectives and shaped a national development strategy, the organizations for regional cooperation will be able to respond to the priorities identified, provide the necessary technical assistance, and contribute to financing programs and projects. The OAS political forums for the exchange of technical information and for negotiation, consultation and mediation will make it possible for the countries to combine their individual national priorities into a collective regional effort in which each one can fully participate.

It was this consideration that inspired the Ministers of Agriculture, in their Eighth Inter-American Conference, to examine food security and energy and recommend that the organs and agencies of the Inter-American System be entrusted with carrying out the studies necessary for the establishment of a system of regional cooperation to achieve food and energy security, and with developing the mechanisms to implement it, including aspects related to financing, technical assistance, and training.

Just last week, the Inter-American System was able to demonstrate how effectively it can serve the needs of our hemisphere through consultation and negotiation, once national needs are determined. The Fourteenth Annual Meeting of the CIES issued the Declaration of Asuncion which reaffirmed the need and urgency of finding permanent solutions to the problem of external debts in the Latin American and Caribbean countries; ensuring the growth of international liquidity, consistent with the gradual process of adjustment; improving operational procedures and reviewing the principles of conditionality in the allocation of resources by international financial

organizations; and avoiding restrictions on free access to capital markets, under reasonable and equitable conditions. Moreover, the Declaration asserts the importance of reviewing international trade policies. In accordance with the Declaration, the Economic and Social Council established a Special Committee on Financing and Trade with the following objectives:

a. Debt

To evaluate and recommend alternatives for bringing the external debt service of Latin American and Caribbean countries into line with real payment capacity and economic development needs.

b. Trade and Finance

1) To evaluate and recommend options to increase resources for financing regional trade.

2) To evaluate and recommend options aimed at the speedy elimination of protectionist measures, recognizing their harmful effect on trade and development, in order to encourage an expansion of trade, facilitate economic recovery and make a positive contribution to the solution of external sector problems and to the development of the region.

It is hoped that the Committee will be ultimately successful in its endeavors. In time we will look forward to an easing of the pressures on our balance of payments and, as a consequence, a lifting of the heavy burdens now placed upon agriculture.

Food security in each country depends basically on its capacity to produce as much of its own food as it can and to be able to buy the rest of what it needs under appropriate terms and conditions. I believe that the Inter-American System is uniquely qualified to help member countries to meet this challenge and, with the cooperation of the United States and Canada, to promote economic and social development in such a way as to establish food security for the people of this hemisphere.

Although I have been concentrating on the problems and potentials of our region, I have not forgotten that we are now celebrating World Food Day. We are part of an interdependent world. If we can strengthen our region as a food-producing unit--one blessed with abundant resources--we can then turn our attention to inter-regional solutions to the world's food problem. In collaboration with the Food and Agriculture Organization, Latin America and the Caribbean can strengthen and lead international efforts to provide food security to the less favored peoples of the world. I believe that the moral and practical issues that move us to cooperate on a regional basis will also awaken us to the ultimate responsibility of banishing hunger for all humankind.

ANALYSIS OF THE STATUS OF AGRICULTURE AND RURAL DEVELOPMENT IN LATIN AMERICA AND THE CARIBBEAN

LUIS J. PAZ SILVA

Born in Lima, Peru. Studied Agricultural Engineering in La Molina Agrarian University, with graduate studies leading to the M.A. degree in Agricultural Economics from Cornell University and the Ph.D. degree in Urban and Regional Planning from Yale University.

Received the Inter-American Development Award in 1976.

Current President of the National Development Foundation, working in association with the Peruvian Agrarian University. Previously worked as General Manager of the National Supply Agency and Director General of Agrarian Planning of the Ministry of Agriculture. Past faculty member of La Molina Agrarian University and the Planning Institute of the Lima University of Engineering. Consultant to various international organizations. Author of studies on agricultural marketing and agricultural planning.

I am inclined to approach my presentation on the present status of agriculture somewhat indirectly, in view of the topic of this Round Table in which I have the honour to take part, the paucity of real changes which have taken place in agriculture and rural development over the past ten years, the availability of a document prepared by IICA with eighty-two indicators on the subject matter of the Round Table, and the participation of two other distinguished speakers who will discuss a similar subject in this meeting.

The document prepared by IICA is designed to keep us abreast of the "status of agriculture and rural development," and our task, as speakers, is to analyze this situation. However, the data we have been furnished permit us to identify only the problems, but not the causes which limit or impede the advance of agricultural production and rural development.

This indirect approach to the study of the status of agriculture and rural development in Latin America and the Caribbean is geared toward the analysis of certain lateral factors. While these factors are not necessarily agricultural, they have a greater impact on agricultural and rural issues than those factors which specifically address agriculture as such.

We are all witnessing significant strides in science and technology, especially in the domain of food production. Nonetheless, 800 million people in the Third World live in absolute poverty, unable to satisfy their most basic needs, and 15 000 children die every day for lack of food or medical attention.

Where have we failed? Where have we gone wrong in our own countries and internationally? Do we really have the political will to guarantee the same rights and privileges for peasant farmers that we provide for other members of our society? What national or international interests are blocking agricultural progress and rural development in our countries?

First let us take a look at what is happening in our own countries. We can then review the international situation that affects agricultural development in Latin America and the Caribbean.

Generally speaking, it is assumend that the Ministers of Agriculture define the agrarian policy of each government. However, while these Ministers are in touch with farmers, and take decisions concerning seeds, research, and technical assistance, it is truly the Ministers of Economy who influence decisions on taxes, investments, duties, exchange rates, credit and the prices of basic inputs and commodities. In some countries particularly during the seventies, the Planning Institutes were very influential in these decisions and, together with the Ministers of Economy, defined what proportion of investments would be used for expanding the agricultural frontier, and what proportion for increasing agricultural productivity.

In those countries that have parliamentary or legislative representation, the law has been oriented toward protecting domestic industry and keeping down the prices of agricultural commodities, to create and maintain industries subsidized by farmers and consequently competitive on the international market. In regional organizations such as the Andean Pact, joint planning was introduced to benefit industry, and farmers in some countries were obliged to buy machinery, equipment and farm implements from industries with a monopoly on expensive products in short supply. Accordingly, the costs of inputs for agricultural development increased more swiftly than the prices fetched for agricultural products, and agriculture became one of the least profitable activities in the economies of most of the Latin American and Caribbean countries.

Many factors have helped speed the migration process toward the urban centers of Latin America. These include indebtedness in countries with costly investments in long term projects concentrated in specific regions, protection for industry to the detriment of agriculture, price controls to benefit the urban consumer, and policies adopted by other sectors in the countries' public administration, geared to benefit the urban resident while neglecting or ruining the rural dweller. This is the continent with the highest number of cities containing over a million inhabitants living without housing, education or health services. The number of unemployed and underemployed persons in the urban population is growing and has turned some cities into dangerous places to live because of emerging social problems. Consumer food prices have soared disproportionately due to an increase in marketing costs, both because of the increased movement of products required to supply large population centers, and because of the remarkable proliferation of retailers for whom small sales of foodstuffs are one of the only employment alternatives available.

We cannot generalize and say that low profitability is one of the main problems impeding agricultural development. To prove the validity of such a statement, a pertinent study would have to be conducted in each country. However, all of us at this meeting, based on the experiences of our own countries, have witnessed the truth of it.

A concrete case, studied by the International Food Policy Research Institute (IFPRI), is that of Argentina. The study, entitled "Agricultura y Desarrollo Económico en una Economía Abierta: el caso de Argentina" (Agriculture and economic development in an open economy: the case of Argentina) covers the period from the postwar to the seventies. It illustrates the chain reaction of policies which have been detrimental to agriculture. Export taxes and import duties on agricultural inputs have depressed prices and reduced farmer income. These measures have decreased the profitability of agriculture as compared with other sectors in the economy, and consequently, investment in research or other projects to expand the agricultural frontier has also become less profitable. This situation has caused a drain of resources from the agricultural sector, rechanneled into other activities, producing a decapitalization of agriculture, reduced productivity and higher costs.

Analysis of these policies in the case of Argentina reveals that if agriculture had not been taxed and the non-agricultural sector (agricultural inputs) had not been protected, the yield from the agricultural and non-agricultural sectors would have improved substantially. This would have translated into increased yields for the economy as a whole and specifically, a higher per capita consumption rate.

With the implementation of such trade liberalization policies, farmers would fetch international prices for their products, more resources would be used for agriculture and productivity would climb.

With the elimination of the export tax and maintenance of the exchange rate, exports would flourish and the world food supply would expand.

Despite progress achieved over the last years in expertise with agriculture and livestock, there is a widening gap in our countries between what could be accomplished and what has been accomplished in agricultural development and between the amount of food required by the population and the amount being produced. Why have we been unable to use our technical know-how to develop agriculture and meet our nutritional needs?

The technology is at our fingertips, but only political decisions in individual countries or at the international level can determine how it will be applied. Every country must have political leadership committed to agricultural development and the rural sector. But what is more, this leadership must understand the agricultural development process and its needs. Politicians in some countries have given first priority to agricultural development but have not known what measures were needed to realize this objective or at least to start the process moving. Many different arguments have probably been used as grounds for giving first priority to agriculture. Many politicians are concerned about agriculture, not so much in terms of achieving rural development and the well-being for the farming population, but for

increasing food production to supply the cities. One would think that these two objectives should lead to the same result, but experience has proved otherwise.

When the objective is to produce enough food to feed the city, the different sectors of public administration do not feel committed to rural development, and claim that agricultural development is the exclusive responsibility of the Ministry of Agriculture, without considering how the policies adopted in their own sector affect the rural sector.

This is the framework in which we should view the isolated efforts of a Ministry of Agriculture in countries where the actions of other sectors have a negative effect on the profitability of agriculture. Taxes are levied on agricultural exports; price controls are introduced on the domestic market; industry is protected at the expense of agriculture; peasant farmers pay into public health insurance plans, but have no access to health services; urban housing programs are developed, but rural housing is neglected; the roads connecting and circling large cities are kept in repair, but farmers are given no access roads to principal arteries, etc. This political approach is concerned with supplying food for the urban population, but not with contributing to the development and well-being of the rural population.

The situation is similar for so-called rural development projects. They usually take place in geographic zones on which the government focuses its development efforts as if these areas were divorced from the national economy. If national policies are to bring about development, they must be geared toward rural development, and not toward actions in isolated geographic areas.

Therefore it is not enough to have a political commitment giving first priority to the development of agriculture in a country. Politicians and public officials must understand how the process of agricultural development works and why it is imperative that policies in the different sectors contribute to rural development. In this domain, international technical cooperation has been almost imperceptible. Perhaps this is because of a reluctance to interfere in matters concerning domestic policy; but it can also be attributed to the difficulty of providing sound advice on agricultural policy in an environment cut off from access to daily political decision making. However, there undoubtedly are indirect ways of making high-ranking politicians and functionaries in the public sector understand which measures adopted outside their sector have a negative impact on the Ministry of Agriculture and cancel out all its efforts. This includes the fields of research, extension and other actions proper to that sector, as well as policies required to give incentives to agricultural producers.

The actions of the Ministries of Agriculture in the areas within their own domain have been insufficient. However, the use of power to influence decisions made in other sectors which affect agriculture has been minimal

because the effects of these decisions have not been analyzed. Ministers of Agriculture are looked upon as being responsible for providing the population with low-cost foodstuffs, and are not viewed as part of a team responsible for attaining rural development.

We all understand that when it comes to development policies, every political leader is confronted with the dilemma of whether to protect and maintaining the popularity and support required to stay in power, or to take decisions which, because they seen harsh in the short term, are unpopular. An unpopular decision may be necessary to facilitate the growth of food production in the medium or long term. For example, price support policies to benefit farmers can, for a time, increase food prices for urban consumers; greater investment in the rural milieu may be detrimental to investments in the urban areas, expansion of rural educational facilities may mean fewer universities in the city. The problem is that these types of decisions determine whether a government will remain in power, and only the politician can sense how far to go in adopting certain policies. The task of the agricultural advisor is to make politicians aware of the multiple effects of their alternative decisions, so that this knowledge, coupled with political intuition, leaves them better equipped to adopt the best possible option.

The same could be said of the international organizations for technical cooperation and financing. The leaders of these institutions act as political leaders, and their decisions can influence a country's domestic political decisions to a greater or lesser degree. This has already been discussed between the Boards of Directors of other institutions and CIAT, when it was proposed that Agricultural Seminars be conducted for public functionaries responsible for making budgetary decisions in the Ministries of Agriculture, Economy and Finance, and planning agencies. The international financing agencies can have more influence on the countries'domestic policy-making, although there is no guarantee that this influence will be positive for the countries. Even if it is, the countries may not necessarily be prepared to accept it.

The adoption of policies which favor the rural development of a country is further complicated by the international policies of the transnationals and the industrialized countries.

Protectionist type measures concern us most at this time. In past years, particularly in the last few months, and most recently in the 38th Annual Joint Assembly of the International Monetary Fund and the World Bank, we have heard world leaders discuss the importance of liberalizing trade in order to improve the economy. It has been said that world economic recovery depends on free trade, and this free trade policy applies to the countries as a precondition for so-called "structural adjustment loans." Since the industrialized countries have no need of such loans, they have not been subject to the pre-conditions and have been able to maintain a strong degree of protectionism, which blocks the entry of products from less developed countries.

These developing countries are instructed to open their frontiers by reducing or eliminating duties, but this fails to be offset be exports to industrialized countries because it places them on an unequal footing. Worse yet, protectionism is higher for processed products, and this blocks agroindustrial development in Latin America and the Caribbean. This protectionism has resulted in higher prices for consumers in the industrialized world, while the less developed countries are unable to expand thefr markets.

In Latin America, we are told and conditioned to produce only certain raw materials on the basis of comparative advantage, while the European Economic Community and the United States continue to produce items for which they have no natural comparative advantage, but which they have decided to protect for political reasons. As a result, the European Community, with a protection rate which fluctuates from fifty to two hundred percent, has become one of the largest food exporters, when only 25 years ago it was a major importer.

Alberto Valdés, in a study entitled "Liberación del Comercio en países desarrollados y sus beneficios potenciales a los países pobres: el caso de la agricultura" (Trade liberation in industrialized countries and its potential benefits for developing countries: the case of agriculture) provides an interesting analysis of this subject.

On the basic assumption that developing countries permit domestic prices to follow world price trends, Valdés studies the possible effects that liberalization would have on the volume of world trade and world prices, on the basis of a hypothetical fifty percent reduction of trade barriers on agricultural commodities in the countries of the European Common Market. The results are only an estimate, since it is difficult to make precise forecasts. Shifts in the world market are too complex if one bears in mind the variety of trade protection mechanisms, the heterogeneity of the products, the interdependence between supply and demand, etc.

In the proposed model, the domestic price reduction prompted by trade liberalization encourages domestic suppliers to cut back on production and individual purchasers to increase their demand.

The analysis covers 57 developing countries and the nineteen member countries of the European Common Market. It examines both tariff and non-tariff barriers, since the latter are very important in agriculture. However, it is impossible to gauge the effect of all non-tariff barriers, such as input subsidies. Furthermore, it must be remembered that the effects of lifting or reducing tariff or non-tariff barriers could easily be cancelled out by other non-tariff, non-measurable restrictions, such as health regulations, trade through government agencies, etc. The analysis is based on a fifty percent reduction of measurable restrictions because any greater reduction would be unrealistic.

The findings of the study of 82 individual agricultural products, both primary and processed, show an estimated potential increase in returns on exports of approximately three billion dollars per year. Of this total, US$1.67 billion represent earnings for Latin America. Profits vary according to the products which each country exports, and some developing countries could suffer as a result.

The study reveals that real protection is relatively high for raw material processing activities. Widespread liberalization would tend to displace part of this activity to the developing countries. For example, sugar has a very high rate of protection, reaching two hundred percent or more. The benefits of reducing tariff barriers are significant, even though the methodology does not entirely take into account the displacement of raw sugar exports in favor of refined sugar exports, which would occur if tariffs for semi-processed items were reduced. This is also true of other products such as coffee, cacao and wine. What impact can these changes have on the agricultural development of Latin America and the Caribbean and on the per capita income of the population?

Per capita income in Latin America rose by two to three percent over the decade of the seventies, but in 1981 and 1982 it dropped by close to two percent. This year the prospects are less favorable due to export declines, the world economic crisis and the consequent need for governments to cut public spending, which has taken its toll on employment and income.

With the recession, developing countries are forced to cut back on imports from the rest of the world and this, in turn, holds back recovery in the industrialized countries. The developed countries will never enjoy a rapid recovery if the rest of the world is not assisted as well. International technical cooperation is required and can contribute, in part, to this recovery, but the most effective and meritorius way of aiding recovery is by gradually eliminating barriers to free trade in the industrialized countries and permitting the entry of products from the developing world.

The hypothetical example of what could occur with the international trade of agricultural products if trade barriers were reduced by fifty percent could also be applied to the case of industrial products in general, particularly industrial products of agricultural origin.

Some countries in Latin America have attempted to develop industries based on agriculture, but as soon as these ventures become successful, they come up against different types of barriers to continued export to industrialized countries. Certainly, all the participants in this Round Table could cite similar examples in their own countries: Colombia, with its flower industry, Brazil with its shoe industry, Peru with its textiles, etc. How can international technical cooperation and donations pull these countries out of underdevelopment if at the same time restrictions are placed on exporting raw materials and industrial exports are discouraged? How can the developing countries buy more from the industrialized countries if they are not permitted to sell the primary or industrialized products for which they have a comparative advantage?

Part of the answer is similar to what is occurring today in the arena of domestic policies. Most of our countries aspire to producing more food to feed their growing urban populations, without giving much thought to rural development or the well-being of those who produce the food. As a result, migration to large cities has increased, and agricultural production has maintained low and even negative rates of growth. Similarly, industrialized countries are urging the developing countries to buy more from them and apparently want them to overcome their poverty; but their policy decisions are contradictory. A perfect example is the case of textile exports from Peru to Sweden. Sweden maintains policies for providing significant technical and financial support to international cooperation. Peru has been one of the major beneficiary countries of Sweden's technical cooperation. However, Peru has problems introducing even modest quantities of industrial products into Sweden. Peruvian textiles were well received in France, Germany, Spain, Denmark, England and the United States. In Sweden, when Peruvian textile sales increased from US$50 000 to US$80 000 in 1982, Sweden decided to impose an import quota of US$80 000. Paradoxically, Peru imports Volvo trucks, a single one of which costs US$80 000.

We are all aware that the developing countries have to invest more efficiently, improve the administration and operation of public enterprise, provide agriculture with incentives and frame population policies, but they must also be able to sell those products for which they have a comparative advantage, whether they be raw materials or industrial goods.

The economic recession has made the adoption of protectionist measures attractive, but these have only worsened the situation. Domestic protection of industry in the developing countries has made agricultural progress difficult. At the same time, protectionist barriers in the industrialized countries have impeded growth and decreased employment opportunities in the developing countries, just as they have in productive activities of the industrialized countries themselves. The World Bank has recommended that the developing countries adopt a development strategy which includes realistic exchange rates, equal incentives for domestic production and for exports, and aperture of competitive imports. In theory, this strategy leads to better distribution of resources, speeds up growth, and protects countries from changes in the world economy. In order for this recommendation to produce positive results, these countries must have access to the markets of the industrialized world. The industrialized countries must also open their markets to competitive imports and permit redistribution of the use of their resources, in keeping with the same principle of comparative advantage which has been recommended for, and sometimes even demanded of, developing countries.

Clearly, the negotiating power of the developing countries has decreased. Indebted beyond their capacity, dependent on the industrialized countries for food imports, capital, technology and managerial skills

for industrial development, they are in no position to dictate conditions It only remains to be said that the future well-being of the industrialized countries depends on economic and social improvements in the developing world over the next few years. The domestic policies of these countries ought to be reoriented from food production to feed the cities, and isolated rural development projects, to multisectoral national rural development policies, an important aspect of which is food production.

Moreover, students of international relations should analyze why horizontal technical cooperation, initiated years ago by the Inter-American Institute for Agricultural Sciences, presently known as the Inter-American Institute for Cooperation on Agriculture, has not produced the expected results. Could it be that cooperation among the developing countries is unfeasible, or that have we not known how to make it work? Or is it that political conflicts and regional rivalry work against cooperation?

To sum up, this indirect approach to the analysis of the state of agriculture and rural development in Latin America and the Caribbean reveals the following: in some of our countries, returns from agriculture are low because of policies which favor industrial development and an urban food supply, raise the price of inputs and equipment needed in agriculture, and control the prices of agricultural products to the detriment of the producer. It would be preferable for industrial development to be based on raw materials of agricultural or livestock origin, but these are difficult to develop because of protectionism in the industrialized countries against these types of products.

The developing countries require more and better political leadership in agriculture, supported by studies and analyses such as those cited above, which can facilitate the politicians' understanding of the developing countries and the industrialized countries, the importance of rural development as a national policy in the developing countries and the complementary need to open the markets of industrialized countries both to raw materials and to processed products.

We recommend that policy analysis groups be established in each Ministry of Agriculture, to perform these studies and advise the Ministers. IICA could support such groups and facilitate the exchange of experiences among the governments of Latin America and the Caribbean.

Studies such as the one we have seen today could be publicized and and made widely available in order to improve the general understanding of problems affecting the development of agriculture, which cannot be solved exclusively through policy measures in developing countries. These solutions also require that certain policies be adopted in industrialized countries, particularly oriented toward trade liberalization.

TOWARD A STRENGTHENED AGRICULTURAL SECTOR IN LATIN AMERICA AND THE CARIBBEAN

ROBERTO VILLEDA TOLEDO

Born in Honduras. Graduate of "El Zamorano" Pan American School of Agriculture, with postgraduate studies in agricultural engineering in the United States of America.

Presently director General of Agriculture and Livestock in the Secretariat of Natural Resources. Previously occupied the positions of Coordinator of the Livestock Program for the National Development Bank; Advisor to the Minister and Agrarian Policy Advisor in the Secretariat of Natural Resources; and Technical Secretary on the National Agrarian Policy Commission.

Author of several articles and essays in his field of expertise.

It is a great honor for me to present this paper and give some ideas on the status of agriculture in Latin America and the Caribbean. Speaking both in general terms and for my own country, I will stress the topic of food and food security for rural development leaders in the Americas, which I hope will contribute to the goals of this Round Table.

This is an extremely propitious occasion, and I am grateful to the Director General of the Inter-American Institute for Cooperation on Agriculture (IICA), Dr. Francisco Morillo, for having invited me to take part in this important international event.

Latin America and the Caribbean have tremendous potential for production and consumption, and their natural resources can make a substantial contribution to the world economy. However, in the past few years, we have been witness to an ever-present concern about such important issues as uncertain food supplies for a growing population, poor use of water, access to energy supplies and others, all interrelated with the development of prosperous agriculture.

These facts, together with the prolonged world-wide economic recession, have forced us, now more than ever, to call a halt. We, the leaders and technical people of the agricultural sector, must examine not only the most immediate problems, but also the trends of our agriculture and our rural development processes. We must begin to allow for all the adjustments which, if made in time and in a joint effort, are necessary to ensure a future of better expectations for the population of Latin America and the Caribbean.

Our Continent is engaged in an intensified process of incorporation into international markets, and this stands in contrast to the lack of strategies for making better use of natural and human resources. Political problems are becoming more acute throughout the Continent, and they continually work against this essential task. Deliberations in our many

economic, political and technical gatherings show that, unless we proceed to integrate our hemisphere acting with the greatest vision and goodwill, all isolated efforts must be in vain.

Figures and data from the United Nations Food and Agriculture Organization (FAO) and the World Bank show us that at present, fully 450 million people, or around ten percent of the world's population, are severely malnourished. If present food production and population growth trends are maintained, this figure can be expected to rise by 750 000 people per month over the next few years. This situation warns us of an uncertain future just over the horizon, and on our Continent, it goes hand in hand with an intensified degradation of non-renewable resources, traditional balance of payments problems, domestic inflation and the constant use of protectionism by developed nations, which limits out ability to place our export products.

All these economic problems in the developing countries of the Americas oblige us to focus our attention on the agricultural sector. This is where we can find the fundamental reply to the challenge that the hemisphere will be facing in the coming decades.

The great unknown is how to make appropriate use of this human and material potential. In my opinion, there are many complex factors involved, but two in particular must be intensely developed over the short term: our agricultural technology, and the adoption of agrarian policies well adapted to the real situations confronting the rural population in Latin America and the Caribbean. These basic components, together with the agricultural activities that we are increasingly developing, will transform the agricultural sector into the driving force of rural development by generating sufficient employment and creating the market conditions necessary for the industrial expansion we need.

The generation and transfer of technology must assume a major role in coming years. This is an alternative that offers us great potential for overcoming the present limitations of agricultural production, productivity and diversification.

It is precisely in this area that the countries of the Americas see IICA playing a strategic, critical role. This spectrum of key technical cooperation projects must provide the foundation and the capacity for orienting the member countries by strengthening national agricultural institutions and helping them develop strategies appropriate to their circumstances. Such a task will be easier for the Institute if it is carried out with a comprehensive vision of the region as a whole and of interrelationships with the rest of the world.

The agrarian question must be approached from several different standpoints. It is essential to adopt a realistic attitude in facing the problems of soaring population growth, land tenure, and promotion of farmer participation and organization. Simply by addressing these fundamental problems decisively and quickly, wherever necessary, we will be able to overcome the already delicate social tensions present in so many of our countries.

As we stated at the beginning, the great wealth of potentially pro tive resources in our region gives us a glimpse of the possibility of overcoming the present stagnation of the agricultural sector.

Only thirty percent of the immediately arable acreage is now under production. Broad stretches of land remain underused, poorly used, or entirely unused. This leads us to the conclusion that the potential fo solving our problem of land tenure may be greater than many realize. We must also recall that, with few exceptions, the land which is already under cultivation is subject to inappropriate, often primitive technol patterns, and there is considerable potential for maximizing the productivity of these lands.

However, we must also understand the truth of what was once said José Emilio Araujo, that land distribution, which so badly needed today in many of our countries, is not by itself enough to contribute effecti to the rural development to which we all aspire. If the agricultural economy is to experience in-depth improvements, this effort must includ credit services, technical assistance and marketing aid. Without them, social improvements make no economic sense.

The formulation of national rural development policies requires, as its most basic ingredients, streamlined agrarian programs, technical su port services, and the promotion of farmer organization and participati

The food problem on this continent, like that in other parts of th world, has aroused considerable concern for IICA's Inter-American Board Agriculture and other agencies of the Inter-American System. Here, in this gathering, we should devote special attention to the characteristi of the food problem in the world and in our region.

We have an apparent abundance of foodstuffs this year. Nevertheles considerable areas have been temporarily removed from production due to prevailing weather conditions over major areas of the world's foremost grain producing nation, the United States of America. Certain policies predating this situation, such as paying farmers to produce less, have compounded the problem, and massive grain sales, particularly to the So Union, have a major impact on the supply and prices of cereals on the w market.

Much progress has been made in removing the immediate threat of a shortage, as a result of food aid, reserves and credit for food purchase Nevertheless, these measures, intended to foster food production and in self-sufficiency in countries assailed by chronic food shortages, have with little success.

The outlook is not promising for low-income, food deficit countries especially because international generosity is on the wane. According t reports from FAO, only six years ago, three of every ten tons of grains imported by these countries took the form of food aid. Last year, less that two of every ten tons of grain imports originated as aid. Bills for food imports have quintupled over the past decade.

The task of improving the food situation is further complicated by the influence of factors related only indirectly to food production. For example, price fixing policies for foodstuffs, depending on how they are applied, can either encourage or dampen food production. One of the major problems has been that policies for providing urban centers with low-cost foods have frequently meant low prices for farmers, who have no incentive to produce more.

Part of the problem in poorer countries is the tremendous investment needed to attain food security. Improvements must be made in land apportioning methods, irrigation and water, highways, and communications and storage facilities, and all these are indispensable, costly prerequisites. Also essential are research and development of farm, forest and fishery systems. Methods of food delivery and marketing also demand continuous improvements, and the high costs of quality seeds and artificial fertilizers, mostly imported, must be covered with funds from the public coffers.

The world food supply continues to be extremely precarious, despite the many efforts that have been made. This strikes a sharp contrast with the apparent abundance of international grain stocks. Forecasts indicate that, if present trends are maintained, world hunger will rise.

Some of the major factors that converge in the world food problem include inadequate productive capacity in various regions that have problems with food supply, vast population groups with little or no purchasing power, sharp fluctuations in production levels, reserves and prices, and concentration of grains on the world market.

We in Latin America and the Caribbean must view the situation with the deepest concern. As has been stated, our role in the world market is that of importers and food exporters. Nevertheless, any search for regional solutions must be based on the premise that the continent as a whole has no food deficit, nor are there any restrictions on its productive capacity. The major food problems in our region begin with the large population groups that have low purchasing power. This combines with poverty, resulting from the economic development problems and, more particularly, problems with agricultural development.

For these reasons, it is essential to develop better designed policies and strategies. If we also learn to make better use of technological and productive capacity, we will be able to generate the employment we need in order to absorb the growing labor force and correct present nutritional deficiencies.

In this meeting of the Inter-American Board of Agriculture, the continent has taken a positive step forward by approving a hemisphere-wide project for food security with a broad scope. We must never feel, however, that this inter-American effort is enough. Rather, it should inspire us to think carefully about the need for coordination and joint action among the many world and regional organizations working with problems of nutrition and food security. It will be necessary to develop appropriate mechanisms for making the most efficient use of limited

available resources. At the same time, without producing unnecessary duplications, the developing countries must make better use of the support and cooperation provided by international organizations active in this field, so important for the human race.

The Third Regular Meeting of IICA's Executive Committee decided that the papers given in this Round Table should furnish ideas on different development styles in the field of agriculture on this continent. Therefore, I have put together some notes on my country, Honduras, that are pertinent to the subject under discussion.

The Government of Honduras is engaged primarily in reinforcing a healthy democracy. It recognizes that economic progress, broadly shared by the population, is the basis necessary for ensuring this democracy's survival. It must, however, be recognized that the Honduran economy is confronted with serious difficulties, very similar to those of the rest of the Central American countries.

These difficulties arise from a confluence of forces that stem partially from the declining demand for major export items, such as coffee, sugar, beef, wood and, to a lesser extent, bananas. Depressed markets for these commodities have repercussions throughout the Honduran economy, exerting a serious impact on trade and industry and affecting the entire population.

One of my Government's basic strategies is to incorporate as many families as possible into the dynamics of the national economy. For this purpose, we have been engaged for over a decade in improving the productivity and income of agricultural workers by promoting appropriately structured organizations, effective technical assistance and viable markets. Groups of peasant farmers are encouraged to exercise maximum control over their own activities, and much success has been achieved in the field of agroindustry.

The cornerstone of agrarian reform in Honduras today is the recognition of full ownership of the land, with titles granted to peasant farmers. This action has been taking place continuously and in an orderly fashion, with the valuable cooperation of the United States Agency for International Development. The work goes hand in hand with an increasingly dynamic credit system, thanks particularly to the cooperation of the World Bank. This month we have launched our Fifth Agricultural Credit Program, using approximately fifty million dollars in special resources. With the granting of land titles, small farmers acquire access to the capital they need to improve and increase their production, through public and private banks.

However, we still face serious obstacles to developing and conserving our country's broad base of natural resources. For example, much of the arable land is subject to flooding. We have drainage or erosion problems that require supplementary irrigation during critical crop periods. The use of improved technology to increase production is not feasible in many

of these places. Until these problems are solved, generally with the infusion of major investments in infrastructure, it will be exceedingly difficult for us to expand our agricultural frontier.

Forest wealth is a fundamental issue for long term development in Honduras. However, this resource is endangered, and the forest industry is in serious trouble as forests are swiftly disappearing. Losses at present can be attributed more to destructive farm practices, grazing and cutting, than to lumber production for domestic use and export. Through present efforts, this destruction is beginning to decline, and other measures are being introduced through a social-forest program. The purpose is to enable peasant farmers to enjoy the benefits of rational forest use and to learn about hillside cultivation and soil management.

One area of particular interest is the joint effort of the public and private sectors to expand our export base beyond the sale of traditional products. At present, studies are underway to identify a broad range of nontraditional crops, and programs are in progress to stimulate farmers to produce those crops which have been identified as having favorable markets, especially as a result of President Reagan's Caribbean Basin Initiative. A major obstacle to future agricultural development in Honduras is the institutional organization of the public agricultural sector, as occurs in so many of the countries of the hemisphere. We have not yet succeeded in designing an appropriate governmental mechanism for coordinating our agricultural development. This is another field in which our countries require constant support in the form of IICA's cooperation.

In closing, I can state that all this concerted effort to provide the rural population with the benefits of public services has fostered social harmony which has contributed much to the peacefulness that can be observed in Honduras, especially in the context of the tremendous social and political instability that surrounds us. The task is still great, but we Hondurans feel that the wheels of development are on the right track.

OBSERVATIONS ON FOOD SECURITY WITH SPECIAL REFERENCE TO LATIN AMERICA AND THE CARIBBEAN

JAIME LAMO DE ESPINOSA

Born in Spain. College Degree in Economic Sciences from the University of Madrid, doctorate in agricultural engineering from the Polytechnic University of Madrid. Presently Senior Professor of Agricultural Economics in the Department of Agricultural Policy, Economics and Sociology at the Technical School of Agricultural Engineering of Madrid.

Served as Minister of Agriculture of Spain (1978 to 1981), Minister attached to the President of Government (1982) and President of the Twentieth World Conference of FAO and of the Conference of Ministers of Agriculture of the OECD.

Winner of the Crosses of Merit of France and of the Federal Republic of Germany, the Grand Cross of the Aztec Eagle of Mexico, and the Grand Crosses of Spain for agricultural merit, civic merit and Carlos the Third.

THE GENERAL PROBLEM

Food security has always been an unfulfilled hope. It has been one of the driving forces of human development and people everywhere have striven to achieve a level of food production capable of meeting their food needs, both in quantity and later, in quality.

Ever since the introduction of the World Food Day, and more especially, since the widespread hunger in some parts of the world produced a heightened awareness, food has been considered a human right. In fact, the right to nutrition is inseparable from life itself.

There have always been food crises, the most recent in the modern world being that of the 1972-1974 period, when food stocks the world over fell to their lowest levels.

Improvement in the food situation in the following years was purely circumstantial, to the extent that by the end of 1980, grain reserves had fallen again to such low levels that FAO called a worldwide alert.

The United Nations Food and Agriculture Organization, FAO, recently acknowledged that the crisis, although temporary, marked "the transition between a time of abundant low-cost foods... and one of extremely unstable stocks and prices." the new crisis is characterized by a confluence of oil price increases and food shortages, and as a result, new cereal importing countries have appeared on the market.

However, today in 1983, the food situation has been complicated even more as a result of:

1) A widespread economic crisis, with low growth rates and persistent unemployment;
2) high energy costs for producing food;
3) the appearance of protectionist trends; and
4) heavy foreign indebtedness which makes it difficult for many countries to buy the foods they need or the machinery and fertilizers necessary to produce food.

As a result of all this, the per capita food and calorie consumption is not rising at the desired rate.

THE GEOGRAPHY OF HUNGER

The most recent estimates from FAO (Agriculture toward the Year 2000) show that at present, at least 430 million people have inadequate diets. One of every ten people is hungry.

Of 89 developing countries, 24 have a mean per capita calorie supply less than or equal to ninety percent of their needs. In 29 of these countries, the percent ranges from ninety to one hundred percent. It should be stressed that, of the first 24 countries, sixteen are in Africa and seven are in Asia. By contrast, twelve countries in the second group are in Latin America.

Annual food production growth rates are highly variable, as can be seen in the following table:

Economy	1976/80	1980/81
Developed market	1.9	1.6
Developing market	2.6	3.8
Africa	2.0	1.8
Latin America	3.7	3.6
Near East	2.5	0.7
Far East	2.4	5.3
Centrally planned	1.7	1.6
Asia	3.1	2.9
Europe and the USSR	0.7	0.1

Source: Report on the Social Situation of the World, New York, 1982

Food shortages, or a shortage of resources for food purchases, have many causes. These include:

-seasonal cycles of agricultural production;
-natural disasters;
-inequality of income distribution;
-lack of employment opportunities;
-lack of storage facilities;
-increasing external indebtedness;
-lack of "soft" technologies; and
-lack of national or regional food security programs.

Recent data on Latin America and the Caribbean clearly show that:

-in at least six Latin American and Caribbean countries, the daily calorie supply per capita falls below human requirements;

-in at least three countries, this percentage is dangerously close to the index of one hundred;

-in eight Latin American and Caribbean countries, the supply is inadequate to meet per capita requirements;

-in many countries, the yields for basic commodities are very low, and contrast sharply with actual potential already realized by others; and

-the net grain production/import ratio is, in most countries, extremely unfavourable.

FOOD SECURITY

Food security persists today because:

-per capita food and calorie supplies have decreased in developing countries;

-food grain imports have doubled in low income, food deficit countries;

-food aid has not attained the levels established by the World Food Conference;

-crop restrictions have reappeared in some countries; and

-growth rates in developed countries have not achieved the levels set for the development decade.

This is why in the future, the solution to the problem of the food/population ratio must be approached from the food side especially in view of the fact that the population in Latin America and the Caribbean will continue to grow until the year 2100, when, according to recent surveys, the population will stabilize.

Furthermore, it is advisable to consider the question of food security nationally and regionally. The world concept of food security must never be at odds with the increasingly intense efforts and initiatives of countries that have a risk of insecurity, and where, in addition, common regional policies in this regard can be synchronized.

The food security of a region is linked to three factors:

-security in agricultural production;

-security in the agricultural food market; and

-security in payment capacity.

Of these three problems, the first can be treated successfully at the national level. However, solutions to the other two are rooted in multinational policies. A negotiated multinational solution may be the most appropriate for a region in which:

1) Farming and consumer lifestyle patterns are similar;
2) National concepts of the farming world are similar; and
3) Food production is complementary among the different countries of a single region.

FACTORS OF CHANGE

Nevertheless, agricultural production (the first factor to consider) is experiencing profound change.

At the recent meeting of the Club of Rome, held in Budapest in September, 1983, it was said that by the decade of 1990-2000, the United States could become a net food importer. Someone asked, "Import from where?" The statement and the question showed very clearly that the aim of regional or national food security must be a short term high priority objective for those countries which are still not self-sufficient in their food production.

It is therefore essential to formulate a method of achieving this self-sufficiency, just as it is indispensable from that viewpoint to question recent events which are changing the "agrarian model." The world must avoid errors in designing future objectives and, above all, the policies which must be followed.

Next, I shall point out some of the factors of change which are producing a bias in the "model."

a) Energy

Agrarian production transforms energy. Petroleum-based calories in the form of gasoline, herbicides, pesticides, electricity etc. are added to the soil, and plant or animal based calories for nutrition are extracted.

It is estimated that an average amount of six fossil-based calories are required to place one biological calorie on the consumer's plate.

What is certain, however, is that, since 1973, energy prices have been increasing sharply, with a particular jump at OPEC II in 1979. Consequently, farmer costs have been rising, and unfortunately, the phenomenon of agrarian price formation has prevented farmer income and sales from rising at the same rate. Income from agriculture has been shrinking and the incentives to produce more have seriously deteriorated.

This is changing the development model of the 1960's, according to which a country was considered strong among nations if it was capable of producing industrial goods. It did not matter that such a country needed to resort to "food charity" from countries with a surplus or from multinational organizations responsible for such things. This model has essentially disappeared. With rising oil prices, many of these countries find themselves holding external debts far in excess of their payment capacity. They are no longer able to import the oil they need, and cannot even pay for imported food supplies. Foreign debt and hunger are the price of an agricultural sector that was shunted aside in the interest of industrial development.

b) Ecology

Concern over ecology has been growing steadily. Today no one can say that development objectives override ecological considerations. This is why the increasing use of fertilizers, herbicides and pesticides is being questioned.

Lands which may be drained and transformed through irrigation and intensive use can no longer be converted in this way, because it would tip the ecological balance of other adjacent or distant areas which are connected by canals or water systems.

The same occurs when deforestation is used for extending land areas used for farming; protection of forested areas must take precedence irrespective of the fact that the forest mass is not necessarily located in the countries with the greatest food problems.

c) Competition for finished resources

When the fence law went into force in England, English farmers claimed that "the sheep are eating the people." Quite simply, the grain supplies that should have been used for human nutrition were, in fact, going to fatten animals. The World Bank estimates that today approximately six hundred million tons of cereals are being fed to animals. If this volume were used for human nutrition, 2.5 billion people would no longer be hungry or malnourished. This is not to suggest that animal species disappear; instead it is an alert to the fact that livestock feeding programs must be built on some other foundation that binds stock mangement to the land, the use of underused species, and the use of agricultural waste products. These are the tools for making quantitative changes.

d) The structure of consumption

Today's grain culture is almost universally dominant, and it has tipped the basic balance in many countries. In fact, countries around the world had been developing the tradition of a consumer structure based on the production potential of land presently inhabited by human populations. The peculiarities of consumption, traditional food preparation practices, and culinary customs in each region were conditioned from the very outset by the ease of producing any plant or animal. Nevertheless, as technology revolutionizes the world, the agricultural sphere finds itself restricted. Many plant species have been gradually disappearing. It was recently said that ten thousand years ago, the human population, numbering five million, had access to five thousand edible plants. Today there are over four billion people, but less than 150 edible plants on the world market. A recent paper by A. Fisher states: "According to the United States Secretary of Agriculture, today only fifteen species stand between humankind and starvation: five grains (rice, wheat, corn, sorghum and rye), three roots (potatoes, manioc and sweet potatoes), two sucrose plants (sugar cane and sugar beets), three seed legumes (beans, soy and peanuts) and two tree species (bananas and coconuts). This concentration of species...at the expense of crop diversity makes us too vulnerable to catastrophic interruption of the food supply by natural disasters or by human intervention."

The above parameters show why it is necessary to formulate a new agricultural policy which takes more factors into consideration.

THE NEW MODEL

These issues illustrate why it is necessary to move beyond the dialectic between traditional agriculture and modern agriculture. I do not care which of these two labels we choose to attach to any agricultural system in particular. Neither one tells us about agriculture today. I sustain that we are witnessing a new model, and this is the source of the difficulties, failure to adapt, and the multiple problems which are emerging in the agriculture of the developed countries. In the past, agricultural supply was based on domestic production, obtained with the use of productive systems under the following conditions:

- highly intensive use of energy through gasoline and nitrogenated fertilizer;
- an extremely low, stable price for energy;
- intensive use of pesticides;
- increasing loss of population active in agriculture, as people emigrated toward other sectors of the economy;
- a continuous search for underground water at depths and in strata that were easy to reach; and
- deep tilling of the land and deforestation, to increase production.

Today, however, these positions have substantially changed, and the model has gone into crisis. We find that:

- energy use is still feasible, but prices are so high that the continued or intensified use of certain farming practices is restricted;
- rapid cost increases have not been fully transferred to consumer prices; because prices are subject to free market forces, they are held down by problems of consumer purchasing power and limited demand;
- ecological pressures, symptomatic of a new concern for environmental responsibility, hamper the increased use of pesticides and indiscriminate deforestation;
- the population active in agriculture is unable to migrate to other economic sectors which promise better pay, because the industrial standstill has become nearly universal; they are also unable to migrate to other countries, because the traditional receiver nations have also been stricken by the crisis;
- aquifers can no longer be found, even at great depths, and the search for water therefore requires high energy consumption, with the concomitant problems discussed above; and
- finally, those forest lands which today can be transformed into crop lands, easily and without severe ecological problems, are essentially located in geographic areas where hunger is not the main problem.

All this underscores the need to ascertain what agricultural model we are using. In any case, such a model should continue allowing for production increases, at the same time enhancing profitability and reducing energy dependence.

In my opinion, an example that clearly demonstrates what we have said up to now is that of traditional genetics. In recent decades, work has been underway to produce varieties that, using low fertility soil and high levels of nitrogenated fertilizer (and energy), could produce high unit yields. Today the scheme must be reversed to obtain new varieties that will give high yields on low fertility soils with limited use of fertilizer and little energy consumption.

The agriculture of the future, or better said, of the present, should pursue clear principles, including:

1. Make better use of available plants, vegetables, and varieties, that are not used today but that possess great potential because of caloric or protein qualities.

2. Improve genetic qualities to increase plant yields, not under optimum fertility conditions, but under the most limited.

3. Establish a new pattern of livestock and crop relationships, in order to free cereal production for human consumption, on the basis of the two principles discussed above, making better use of agricultural residues.

4. Persist in the biological research and genetic studies for pest and weed control.

If this new agriculture were to be expressed in a single sentence, I would call it "the genetization of agriculture."

FOOD SECURITY FOR LATIN AMERICA AND THE CARIBBEAN

Latin America and the Caribbean are feeling the effect of the general economic crisis and new factors of change just as intensely as the highly developed countries, or more so.

This reduces job creation capacity of the non-agricultural sectors most likely to absorb agricultural unemployment and to generate greater productivity.

In addition, the problems arising from the foreign debt situation of various countries cause difficulties for importing food and are leading to the appearance of new forms of protectionism. This lessens the chances for expansion and growth in economies which are very dependent on agro-food exports.

It is therefore necessary to tackle the problem of food security in Latin America and the Caribbean in order to guarantee increased production and orderly markets, both nationally and internationally.

In such a program IICA can play an important role by providing the necessary studies and making proposals to determine clearly the acceptable risk limits in the area of food for each of the countries of the area. The above-mentioned policies must be formulated either in collaboration between IICA and the countries, or for the region as a whole.

To this end, certain tentative suggestions could be made as to what the study should offer for consideration by the Member States:

1) Definition of what products constitute the basic food supply for each country, with a quantitative study of normal and abnormal production cycles.

2) Determination of the levels of stocks, in order to prevent or reduce risks in the region.

3) Rules for the financing and operation of a type of "Mutual Food Security Fund" among the countries committed to participate in the stock program and in policies for expanding this production.

4) Joint definition of the program for expanding production of these items; applicable techniques and policy for concentration and cooperation with countries outside the area to ensure that these techniques are incorporated.

5) Establishment of an orderly price and market system which would be put into effect nationally to test its efficiency for several years. In a later phase, the mechanisms would be established for interrelationships among the different national markets of the region.

6) Joint plant protection and animal health programs aimed at products mentioned in Point No. 1.

7) Development of agro-industries for making better use of products, keeping stocks "non-perishable" and thus guaranteeing against the aggressive, belligerent use of stocks on the market.

8) Introduction of training programs and agricultural extension services, with sufficient international cooperation to guarantee the level of expertise necessary for the success of the program.

CONCLUSION

It has been said that an Englishman once asked a farmer to show him the best way of getting to London. The farmer replied "I suggest you leave from somewhere else." Obsiously, the ideal would always be to begin in a better postion; but in this case, the problem of food security would never even have happened. The right to eat is a human right. It is useless to ignore the responsibility of those obliged to procure financial and human resources for solving the various problems. They cannot choose between solutions; such a choice must always be against hunger and in favor of humankind.

In this sense, the foregoing may never be implemented; but at least it will serve as a point of departure for discussing a few lines of action designed with the aim of helping to solve a serious problem.

COMMENTS BY DR. JOSE EMILIO G. ARAUJO

RECIPIENT OF THE INTER-AMERICAN AGRICULTURAL MEDAL, 1983

I would like to begin by expressing my gratitude to the Director General of IICA for having invited me to participate in this Round Table as a commentator. At the same time I would like to apologize for the fact that I did not receive the document until today and therefore have had to study it quickly. On the basis of the ideas developed here, I will try to make some brief comments on certain matters that are of concern to me. While we all feel very pessimistic about the present state of agriculture, I believe that in Latin America and the Caribbean, this is the sector that is essential for pulling us out of the crisis the world is living in today. Our region is facing particular difficulties, and finds itself held back by the tendency of developed countries to preserve difficult conditions, especially in terms of the external debt process. We have with us today representatives of the countries which are holding the largest portion of the 350 billion dollar external debt, beginning with Brazil, Mexico, and Argentina. It is enough to recall that Brazil, with its 98 billion dollar debts, has decided to use only 45 billion dollars of this money for investment purposes. The rest went to interest payments. We are repaying more than twice as much money as we actually used in the country.

I believe the document should be expanded to touch on two or three points which are not included, and which will be useful for the next conference on agriculture in the present crisis situation, including alternative development models based on agriculture. One such issue is the internal debt. Another extremely serious problem which is gaining greater importance is credit. For example, if we examine agricultural credit in Brazil, we find small farmer credits which, despite heavy subsidies, are charging 140 percent interest.

The subsidy is real, given that the country is experiencing 180 percent inflation per year. This is a serious form of internal indebtedness that will have serious repercussions on the domestic economy. In some countries, such as my own, high inflation will have serious consequences for agricultural development and for the dynamics of agriculture in general.

Another issue I would like to see clarified is absent from the table of contents of the working document, although it is briefly mentioned in the text: the cutback of resources for research. I have the impression that this is a subject that must be examined in greater depth. In my country, research funding has had a major impact in recent years. In southern Brazil, rice production ten years ago reached barely three tons per hectare. Research showed that the rice varieties being used grew best if days were short. Varieties for long days were introduced, because we receive fourteen hours of sunshine on a summer day in the southern part of my country, from five o'clock in the morning to seven or eight at night. As a result of the introduction of these new varieties, adapted for longer days, rice production changed radically. Today we are averaging seven tons per hectare, with some farmers actually reaping as much as nine to ten tons per hectare of rice. In another example, IICA's action in the sugar cane region of Brazil brought major production changes in this coastal zone of the central part of the country.

Production was averaging forty tons of cane per hectare, with a small investment in irrigation; sugar fields are now bringing in 180 tons per hectare, and intermediate crops are being grown between the cane cutting seasons. The result is a harvest of 2500 kilos of corn and 800 kilos of beans, a result of the more intensive land use.

I have always insisted that the potential of the tropics be more fully studied. Here in the Americas, in Brazil alone, we have 180 million hectares stretching from Cejal to Sabana Alta, and continuing into the plains of Venezuela and Colombia. All this land contains some 250 million hectares of potential cropland if the water problem is solved. The tropical zones in our countries, for which production systems have been under experimentation in Turrialba, have already shown their potential to produce ever increasing amounts of calories for human nutrition. For example, the corn, beans, cassava and sweet potato production system can produce four times as many calories as two good corn harvests on traditional corn land.

As I read over the working document, I noticed very little discussion of the general problem of land redistribution, either intentionally or because data were not available. I would like to see IICA take a new look at this issue. In my country, eighty percent of all the foodstuffs are produced by smallholders, each owning less that ten hectares of land. This concerns me because we find similar figures in all the countries (some more than others), and we cannot forget that most of these producers are minifundia farmers. They own so little land that they are unable to improve their standards of living. Therefore, hard decisions must be made if we think about land redistribution programs and examine the events of recent years. The 1964 Cadastre in Brazil showed fifty percent of the farmers working on minifundias: of the five million farms covered by the farm inventory, 2.5 million were classified as minifundia, according to the difinition in the land statutes. Ten years later, a similar inventory was conducted, and the percentage of minifundia farmers was found to have risen to 72 percent. The land had become further concentrated in fewer hands. In other words, we are still moving in the same direction that I mentioned so frequently in IICA's discussions in the past, with seventy percent of the people owning four percent of the land and four percent of the people owning seventy percent of the land. This ownership pattern continues to place heavy constraints on the entire agricultural process. Neither modern technology nor great research programs can have any effect when we work with this type of agriculture. A person who owns a single row of sugar cane has no opportunity whatsoever to improve income, and no chance of leaving poverty behind.

Another important point merits a more in-depth discussion in the document, as was already mentioned by previous speakers. Development in our Americas is inhibited by the fifty million people in this continent who are living in poverty, have no purchasing power, or whose families are beyond the pale of the development process. I am deeply concerned about this issue, and I would like to state clearly at this Round Table that the excellent document being presented should be supplemented with indices on land distribution, so as to provide a basis for agrarian transformation. We must never forget that food security is governed by farm production security and is subject to security in the agricultural food market. This is why poverty and assured debt repayment capacity are such important considerations, both for farmers who hold domestic debts, and for countries with external debts.

COMMENTS BY MS. NYDIA VILLEGAS DE RODRIGUEZ

MINISTER OF AGRICULTURE AND ANIMAL HUSBANDRY

OF VENEZUELA

I would like to begin by discussing wheat. Let us take a look at the import figures on essential products for many countries of Latin America and especially Venezuela and other Andean countries. We find that we have altered our eating habits, bypassing a crop that we were able to produce on our own land, and adopting a crop which is more difficult for us to grow and on which we have developed total dependency: wheat. It is time for us to revise and alter our planning programs and begin basing them on what we are able to produce.

Agricultural policies must be fed by other policies. It is therefore important for us to act the way other sectors of the economy behave. For example, I agree that international cooperation is due to make some changes, and I would like to take this opportunity to say so. IICA is one of the organizations that I can proudly applaud, for it has always attempted to work effectively, to avoid the trap of duplication of efforts, and to coordinate its work closely with other cooperation organizations. I hope this example will be followed by other major international cooperation institutions.

At this time, I would like to share with you a special concern of mine. Every time we get together to talk about the problems of the agricultural sector in the continent, we come up with a fine diagnosis. We all agree with each other. We all declare that agriculture is all important. Subsequently, when our budgets go into congress, we all take cuts in the agricultural sector instead of other sectors. It disturbs me that we should be content to agree with each other on a diagnosis. It disturbs me to see our countries demonstrating the very problem we agree over--our weakness. The role of the agricultural sector is fundamental, not only because it provides subsistence, but because it alone can give us the most important sovereignty of all--independence in basic foodstuffs.

Those of us who are involved in the agricultural sector understand this very clearly. We do not have to invent new occasions to discuss the role of agriculture. However, we must move very quickly to evaluate all joint measures to be taken, and we cannot wait too long. Now is the time for agriculture to move, to bring our countries out of the economic and financial crisis affecting the world. I hope the proposed meeting takes place very soon, so that agriculture in the Americas will not lose this opportunity.

COMMENTS BY MR. MIGUEL MUYSHONDT YUDICE

MINISTER OF AGRICULTURE AND LIVESTOCK OF EL SALVADOR

The people most directly responsible for our underdevelopment are we ourselves. We complain about the foreign debt, we complain about developed countries, we complain that the great capitalist power has to sell wheat to the great socialist power. Just the same, in our countries, efforts are being made to lead us down socialist paths, and this must be examined carefully. The representative of the Organization of American States spoke about the importance of the private sector. I fully agree with her that the private sector, with its dynamism, its innovativeness, and its dedication, is the answer to a large number of problems. In many countries, such as my own, the private sector has been destroyed by ideas which are imposed, pushed, and dictated from outside. If the private sector is to devote itself to the nation's recovery, it must, first and foremost, have legal and political security and the economic independence to act freely. If it feels the sword of Damocles over its head, the private sector pulls back and contracts.

Our countries, and most especially my own, have suffered from dishonesty in the government. It is true that our underdeveloped countries are poor, but how many millions of dollars have streamed away through our door? We never talk about these things in public discussions; we are afraid to face this essential condition of our lives. This is why we must begin to guarantee political and administrative honesty in our countries.

I also believe that government bureaucratic favors and paternalism have been and will continue to be the factor which most strongly impedes the development of our agriculture. My country is no exception, with the Ministry of Agriculture occupying a secondary position. Let me give you an example. Almost one year ago, a National Commission for Economic Reactivation was established. In an eminently agricultural country like El Salvador, it would have been most natural for such a commission to be led by the most important ministry present: the Ministry of Agriculture. However, the Minister is not even on the commission. They want to reactivate the economy of the country with what I call pseudo-industry, because back in the 1950's or 1960's, it occurred to someone that Central America had to industrialize. We had not even learned to walk, and here they wanted us to run. Salvadorean industry depends on imported raw materials, yet little or no importance is given to consolidating a true agroindustry in which we would produce the raw materials we hope to process, with no need to expend foreign exchange.

It is the international organizations for technical and financial cooperation that should try to understand us and work more flexibly so we will not need to depend on international charity. We have our pride as sovereign and independent countries. There is no need for us to crawl on our knee and beg for those things we rightly deserve. This is why financial and technical cooperation should be offered in an atmosphere of dignity and freedom and should be appropriate to our real needs, our own resources and our own national development plans. They should not be turned over as a package to be implemented, with no recognition of the idiosyncracies of the very people who are supposed to benefit from such projects.

There are many agricultural development projects being carried out in El Salvador by different cooperation agencies; there is no coordination among them, so that time is wasted, human resources are underused, financial resources are frittered away, and in the end, as the Minister from Venezuela pointed out, we have more and more projects and find ourselves further from attaining the productivity that will bring social and economic well-being to our rural families. I would like to ask that we forget about agrarian reform. We have already tried agrarian reform in a number of the countries represented here, and it was a failure. Let us speak rather of a transformation of the agricultural sector which is much broader and much more revolutionary. Giving land to a small-scale farmer does not necessarily give him happiness, prosperity or production. There is more to it than just giving a piece of land. In my country, we have had two contradictory situations. First the large latifundia farms were expropriated. We call them latifundia, but if we compared them with the latifundia of the great powers, they would look more like minifundia. At the same time, however, there was a decree called "Land for those who work it" that eliminated the small parcels being rented out. On one hand we are trying to promote community or cooperative agriculture on large holdings, and on the other, we are promoting minifundia. Let's get this straight. If possible, I would ask that we begin to make changes and that we try to transform something so basic that we never seem to talk about it--our own transformation as men and women. A personal transformation will allow us to see these things more humanely and more realistically. I think those of us who work behind desks find ourselves saying that the farmers always think the same way we do. How often do we conduct surveys to find out what the rural families really want? Instead we hand them pre-packaged solutions drawn up in air-conditioned offices by people wearing suits and ties, without really giving them the answers they need. As the Minister from Venezuela said, agriculture and agricultural producers have simple problems, and they need simple solutions. They do not need grand infrastructure in order to find solutions. As in the case of Spain, they do not need tremendous projects and irrigation districts, when it is better for individuals to make their own efforts and receive guidance from the government to establish small projects that, little by little, end up covering thousands of hectares. Because the farmers built them, the farmers appreciate them, care for them, and make them produce.

Finally, I would like to suggest that the words "production and productivity" always appear in conjunction with another important word: profitability. It is no good to spout off statistics and claim one hundred or two hundred quintals of something have been produced if we end up with economic losses. The costs of production may be too high. We have to balance what is produced with what the producer earns, which in the long run are colones, pesos, or dollars, not production or sales figures. The farmer wants to know how much he sold and how much he has in his pocket. Finally, and this is something we are beginning now in El Salvador, I would like to reiterate our interest in orchestrating projects already underway so that, working together with the Ministries of Health, Public Works, and Education, we can coordinate the development of high priority zones. Everything can then be planned at the grass roots, using agricultural development poles as the center for unifying and coordinating efforts. We cannot continue to develop rural communities which have nothing to do, because people will just keep migrating from the country to the cities in search of better opportunities.

Let us take civilization to the countryside, as this is what we need. Let us take the city comforts to the field so that our people will stay in the country.

I would like to end, my friends, by quoting the slogan that has been adopted by President Monge of Costa Rica. The motto of his electoral campaign was "Back to the land," meaning that it was time to return to agriculture. When I was in Costa Rica, we added a new meaning to this "Back to the land." Not only will we return to cultivating the land, but we will place our feet squarely on the ground. Let us stop planning so much and begin to act in the benefit of our rural family.

CLOSING REMARKS

DR. FRANCISCO MORILLO ANDRADE

DIRECTOR GENERAL OF IICA

As moderator of this Round Table, I am now called upon to close the discussion, and in so doing, I would like to share some thoughts on the subjects we have discussed. As the Minister of Agriculture and Animal Husbandry of Venezuela noted, we do not want to go away overwhelmed by the magnitude of our crisis, by its profound implications, and by the pessimism it instills.

I would like to say that, while everything we have so clearly stated about the situation in our countries is true, we cannot forget that agriculture is the cornerstone for recovery. This is the sector that can give us a sound basis for finding the kind of swift, sustained reply we need in order to recover and to achieve development over the medium and long term.

We have learned that there is a need for a new policy, an economic model that takes into account the role of agriculture in the lives of the countries and in development. This economic model is, first and foremost, internal. It takes into consideration the rural population, their standards of living, and their contributions to society, far beyond their tasks as suppliers of other sectors, including food for urban residents, foreign exchange for the economy, and energy products, a new responsibility we have assigned to agriculture only recently. The model also has an external economic component, involving just terms of exchange. We have already seen that, even with the rising production achieved by the agricultural sector, the total value of the gross national products in the hemisphere has shrunk because of price falls.

We have spoken of a technological model, the capability of the agricultural sector to respond to technology, and the capacity of our continent's ecological wealth to provide resources for production. This is why our technological approach must involve better use of existing resources. If we have pasture lands, why do animals eat cereal instead of grasses? If we have poor land, why are we not looking for varieties and seeds, as Mr. Lamo stated, that will make the best possible use of the land we have, and production systems that will improve soil fertility? We already have the technology to improve, rather than degrade, soil fertility without increasing agricultural labor.

We can state with great satisfaction, and as a result of this Round Table, that there is a new door opening to innovative political, economic, social and technological thinking. In IICA we have been able to generate or compile this information and put it into a meaningful form, interpreting it and bringing it to you today. This has been a great effort, but we have been pleased to listen to your presentations and comments on the situation and dynamics as described, and we believe that the efforts have not been in vain, but have been fruitful. We hope to make the product of this effort grow, and soon to have more studies or ideas developed in greater depth for

presentation and discussion at the meeting that has been suggested here by the Member States. As Mrs. Callender stated, this meeting could be held with support from the General Secretariat of the Organization of American States. Our purpose is to find the most effective ways of putting an end to a very critical situation, using the tools most directly available to us.

We cannot close without stating that, in this increasingly interdependent and interrelated world, we will have no success without international understanding from the developed countries. It is time to recognize that the barriers of protectionism, or in many cases, protectionist manipulation, or at times the attempt to manipulate supply and demand by exerting economic power to maximize receipts and minimize expenditures, are exceedingly detrimental to the recovery and development of our countries. Until some type of international understanding has been achieved, it will be very difficult for us to cope with the magnitude that the crisis has achieved, including the problems of debt service and interest rates and the percentages of our production that this debt service actually absorbs. I believe that these conditions are the clearest proof available when we call for world comprehension. Other countries must understand and see that the solution to these problems will determine their own well-being. Unless there is justice, there can be no peace or tranquility.

As an international organization, we hope to make our own contributions in this context for improving relations with developed countries and with international financial and technical cooperation agencies. We are at the service of the countries, and we believe that the very essence of IICA is its willingness to achieve international cooperation for the benefit of each and every Member State. It is because of this essence that we are willing to take actions which our Member States believe will lead them out of this recession and help them begin anew, with greater optimism and sounder bases, down the road of agricultural development and well-being for the rural population. All our people must have access to well-being, and we must never forget that it is the agricultural sector, as I said at the beginning, that is the focal point of our potential for recovery.

Many thanks to all the speakers, the commentators, the participants, and the Ministers who have enriched us with their ideas at this Round Table.

PART TWO

PART TWO

THE STATE AND DYNAMICS OF AGRICULTURE AND RURAL DEVELOPMENT IN LATIN AMERICA AND THE CARIBBEAN

Round Table

Second Regular Meeting of the Inter-American Board of Agriculture

Kingston, Jamaica, October 28, 1983

The original Spanish version of the document presented to the Round Table of the Second Regular Meeting of the Inter-American Board of Agriculture was prepared by Mario Kaminsky under the general supervision of Rodolfo Martínez Ferraté, and with the close and valuable cooperation of Rosario Bogantes and Zaida Granados, all members of IICA's Directorate of Analysis and Evaluation. The work benefitted from the help of Alvaro Luis Sánchez, of CIDIA, and thrived on the productive environment of the Office of the Assistant Deputy Director General for Program Development and IICA in general. This English version was prepared by Elizabeth M. Lewis, of DIPAI, and her expertise and dedication are duly acknowledged.

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INTRODUCTION

This paper has been prepared as the base document for the Round Table entitled "Examination of the State of Agriculture and Rural Development in Latin America and the Caribbean." This Round Table is scheduled to take place during the Second Regular Meeting of the Inter-American Board of Agriculture.

Many activities have gone into its preparation. An effort was made to develop a permanent mechanism laying the organizational, methodological and informational groundwork needed for conducting this type of study in the future, making each one ever more complete, accurate and rigorous.

Because of the final use for which this paper is intended, it has been written in a synthesized style, stressing the most important structural characteristics of the present situation and processes of change in the countries of the region. At the same time, it was essential to provide a compact information base, as systematic and complete as the methodology would permit, and within the constraints imposed by the different data bases and sources available.

This document will soon be followed by others, taking a much more detailed and extensive look at the different component topics, whether methodological, informational, or related to findings, analysis or interpretation. These future studies, in turn, will use a division that is effective for giving separate treatment to substantive fields of analytical interest, such as the three subject areas incorporated herein. Different approaches could also be used, such as static or dynamic conditions. Different criteria could be adopted for grouping the basic information units (countries), such as geographic areas or types of countries. Examples can be found in the preliminary documents examining general methodological subjects and methodological aspects of typification and validation, together with empirical findings in the specific topical field of food and food security 1/, 2/.

Upcoming and published documents stress general and specific methodological concerns or substantive subject areas, with the support of empirical information, analysis and interpretation. This treatise, however, focuses mainly on the empirical findings and their interpretation, as comprehensively and compactly as possible.

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1 Estado y Dinámica de la Agricultura y el Desarrollo Rural en América Latina. Indicadores Sintéticos y Tipificación de Países, IICA, Directorate of Analysis and Evaluation, Fourth Latin American Congress of the Econometric Society, Santiago, Chile, July 1983.

2 Tipificación de Países de América Latina y el Caribe según su Estructura y Dinámica Alimentaria y Agrícola, IICA, Directorate of Analysis and Evaluation, Fourth Latin American Congress of the Econometric Society, Santiago, Chile, July 1983.

In line with these considerations, the material will be organized as follows. The first section gives a brief, descriptive summary of the methods and techniques adopted and the nature of the general findings made with the use of these methods. These characteristics are then divided into separate sections and illustrated in practice, in a synthesized presentation of the empirical findings.

This is followed by a section presenting information on the region as a whole, i.e., the aggregate of all the countries of Latin America and the Caribbean. The purpose of this presentation is to reveal clearly the most striking overall characteristics of recent patterns of change in this region by analyzing and interpreting the four fields in which changes have been most dramatic: production, indebtedness, the external sector and balance of payments, and prices and terms of trade.

This comprehensive discussion is then followed by a more specific approach divided into three sections that break down the aggregate whole into groups of countries of major analytical interest. The first of these sections uses a comparative approach to examine IICA's four geographic areas, analyzing different indicators of state and dynamics that were prepared on the three topical fields that had been established for concentration in the study: food and food security, the external sector, and employment, income and agriculture as a whole. This is followed by a section that focuses on these same topics and gives a comparative analysis of the conditions of the present state or situa- tion in the three types of countries that were identified and characterized in the base document. The final section contains empirical information on the three topics of concentration defined earlier. As in the preceding section, the comparative analysis is structured on the basis of the types of countries that were iden- tified and characterized. The difference is that in this section, both the typification and the substantive analysis focus on the conditions of change or dynamics, instead of present state.

The text closes with a section giving a general summary and conclusions. The attachments include a description of the indicators that were constructed and used, a listing of the sources of variables from which they were derived, a transcription of the data, a summary of the proposed typification method that was used, a number of statistical tables and supplementary graphs, and an alphabetical bibliography.

SUMMARY OF METHODOLOGICAL CHARACTERISTICS

Traditional methodological approaches offer extremely limited possibilities for drawing inferences with the use of either of the two usual extremes:

a) analysis of aggregates for the region as a whole;

b) analysis of the indicators for each country of the region.

The first is simple enough, but in most cases, it is totally inappropriate for two reasons: a) it masks often dramatic differences among countries, which reflect the prevailing structural heterogeneity; b) it is biased as a result of the disproportionately high relative weight of the "large" countries. The second traditional extreme is also inappropriate, as it is impossible (or in any case, inefficient) to examine all the multidimensional indicators of every country in the region at the same time.

One of the methodological procedures used for this study is based on the hypothesis of heterogeneity. It seeks to identify and validate groups of countries with homogeneous characteristics, from both the structural viewpoint of present status, and the dynamic viewpoint of change over time. With this procedure, it is a simple, low-cost matter to maximize the informational content of the messages received from pertinent statistical data. An additional comparative analysis is based on the groups of countries included in each of the Institute's geographic areas, as further input to the discussion.

An extensive array of simple quantitative indicators has been used for both establishing and validating the groups or "types" of countries and for the comparative analysis. These indicators are listed in Appendix A. In all cases, a maximum amount of available information was used for the most recent period. In most cases, this means the years 1981, 1980 or 1979 for indicators of present state or situation, and the most recent decade for the discussion of change or dynamics.

The simple quantitative indicators on which the analysis is based were constructed with the general purpose of retrieving simple, revealing informational messages on the phenomena targeted by the study. In particular, this meant isolating or "filtering out" the spurious disturbing effect of the "size" factor of economies included in the matrix of basic data. This was done by finding relationships among variables of origin, often in the form of a ratio between pairs of these variables. The result is the pertinent simple indicator. Appendix A gives the formulas that were used for the different cases.

Three sections of this study focus on particular groups of countries (geographic areas or types of countries). The procedure used to generate these findings by groupings serves the same purpose discussed above.

This is because the object of analysis in these sections is the country as a self-contained, significant, sovereign unit, regardless of its size or its relative importance from any point of view. For this reason, all the group averages used in these three sections of the study are simple, unweighted arithmetic means at the country level. In simpler terms, this means that in the discussion, all countries have equal worth, meaning, and weight. Rigorous efforts have been made to avoid using weighted averages resulting from relative "weights" assigned to specific countries or groups of countries, either explicitly or implicitly, as is usually done when dealing with simple averages of aggregates of countries.

It should be noted that, while the following section deals with Latin America and the Caribbean as a whole, the analysis of findings frequently covers the aggregate, rather than country-level averages of all the countries included. This was done when complete country-level data were not available. In such cases, the information originally ascribed to the aggregate was used, as found in the pertinent source.

Much of the analysis is based on simple isolated indicators of the groups indicated above. It often proves tiresome and tedious to consider such a high number of indicators, and therefore the study includes a procedure for deriving synthetic indicators which provide a simple means of retrieving a maximum of informational content for the numerous sets of simple indicators available. Three possible applications can be visualized for these synthetic indicators: a) as supplementary input for the process of typifying countries, discussed above; b) for the analysis of the present state and trends of intrinsically multidimensional phenomena which can nevertheless be compressed into one or very few basic or principal factors; c) for simple, summary follow-up in the future on the of the behavior patterns of these indicators, once they have been established. Available results in this regard are encouraging.

The analysis for sets of simple and synthetic quantitative indicators is based on the results of pertinent statistical estimates. When no nigh and statistically significant intergroup differences are identified, inferences are made for the region as a whole. On the other hand, when nigh and significant differences are found among groups, they are evaluated for meaning and impact in order to produce the most refined characterization possible of the different "types" or areas.

This completes the very summarized review of certain methodological characteristics of the empirical work that was undertaken, that merit special mention. Appendix C, at the end of the study, gives details which could not be discussed in depth in the text. They particularly target the nature of the proposed method used for typifying countries, and include related information of a more general nature.

The method used for country typification as such was used separately for each of the three targeted topical fields (food and food security, the external sector, and employment, income and agriculture as a whole). For the task at hand, however, it would be extremely tedious to discuss the types of countries that are naturally differentiated for all three of the targeted topical fields. Therefore, this paper will present and analyze a general summary typification, synthesizing as accurately as possible the separate findngs obtained for each targeted topical field.

This section closes with a summarized description of the procedure used for the synthesis. This procedure generated the final types identified, in terms of both present state or situation, and factors of change, both of which are discussed in separate sections. A general discussion with a more complete empirical and interpretational content can be found in the introductory paragraphs and in the "General Description of the Types."

The synthesizing procedure is essentially simple. Its point of departure is the observed final composition of every group or type identified in each of the three targeted topical fields. The most common "behavior patterns" are identified as those that are found in significantly higher frequencies of countries. The three patterns which occur most frequently in absolute terms are selected. An example in the field of dynamics would distinguish those countries that consistently sustain better relative positions in all three targeted topical fields, those which hold intermediate positions in all three fields, and finally, those that consistently occupy poor positions in all three. Naturally, the twenty countries included in the study are not all this consistent.

A selection can then be made of those countries which display consistency in the sectoral groupings. These countries are adopted as "basic matrix types," as defined in Appendix C. Countries which do not belong to any of these three matrix types are then assigned to one and only one. The assignment is based on these countries' values for each of the six synthetic indicators (two per targeted topical field). In classifying the countries, their specific generalized distances are calculated for each topical field, and the total is computed for all topical fields as a whole. Each of these countries is then ascribed to the particular "basic matrix type" from which it is separated by the shortest distance. In other words, it is assigned to the group or type which it most closely resembles in general terms and for each of the three topical fields. In this sense, when we speak of a country's "distance from a group," we mean distance from the center of the group. This, in turn, means simply the country's average or simple arithmetic mean.

Thus, the final type or group is established by combining the array of countries truly belonging to each basic matrix type, with the countries ascribed to it using the procedure of assimilation or similarity. This procedure generates a total of three types or final groups, the general characteristics of which are reviewed in the first paragraphs of the chapters that

contain discussion and analysis of the findings by "type of country." The synthesizing procedure which was necessary is somewhat "ad hoc," but it fully satisfies the methodological and technical criteria for the "Cluster Analysis" technique briefly described in Appendix C, under "Techniques Used."

SALIENT CHARACTERISTICS OF RECENT PATTERNS

International cooperation has an important role to play in promoting agricultural development and rural well-being for the people of Latin America and the Caribbean. In order to evaluate this role, it is essential to analyze the historical progress and present status of general conditions, and especially economic conditions, in the region.

In recent years, it has been increasingly claimed that crises have a positive side. They may provide the impetus for defining new objectives and methods so that earlier, still unattained objectives can be reached. While this is true enough in general terms, it is even more striking in the field of agriculture and agricultural development in this region, where their role in the past has been subject to many types of criticism. For better or for worse, the countries of Latin America and the Caribbean are now living through a recessionary crisis in conjunction with severe indebtedness with deteriorating conditions in the external sector. Some of the most characteristic and dramatic features of this situation, as revealed by recent indicators for the region as a whole, will be discussed below.

Production

Recent figures on both overall production and agricultural production are disturbing, but it is helpful to compare these two sets of figures. Although we find that the agricultural sector is being called upon to play a buffering role during the present decline, changing structural needs call for the design of new policies to expand this role so that the sector can act as a decisive driving force in bringing about the desired recovery.

The growth rate of the gross domestic product for the region fell between the two five-year periods of the previous decade, and the performance of the sectoral product also slipped. However, in 1981, while the growth rate of the overall product declined to around one-fourth the levels reached in the previous decade, the growth rate for agriculture rose by about the same proportion. With the performance in 1982, the region went on alert, seeing with concern that the overall product not only failed to show any growth at all, but actually fell in absolute terms (-1.2 percent). Agriculture did not fully reflect this pattern, instead exhibiting zero growth. In terms of the number of economies affected by this severe recessionary wave, it should be noted that in 1981, two-fifths of the countries had already experienced declines in overall product, and by 1982, this proportion climbed to three-fifths.

Meanwhile, the region's population continues to surge. If population growth is compared with the figures given above, we find a sustained downturn in the per capita growth rate of the product between the two five-year periods of the previous decade. By 1981, this slide reached negative one percent, and

continued downward in 1982. Today, the negative growth rate has reached the same magnitude (-3.4 percent) as the positive growth rates that prevailed during the seventies. Again, in terms of the number of economies affected by this trend, in 1980 around one-fourth of the countries of the region were experiencing negative growth rates, and by 1981, the proportion had soared to one-half. The spread was alarmingly complete by 1982.

Although these effects are distressingly universal, it is impossible to ignore the tremendous structural and dynamic heterogeneity that characterizes the aggregate. As will be seen in detail in a later section ("Change or Dynamics by Types of Countries"), during the past decade the per capita gross domestic product for the most dynamic group of countries (Type 1) experienced an average cumulative annual growth rate of three percent. At the same time, the least dynamic group managed only a little over one-third this rate (1.1 percent). In the field of agriculture, this disparity is even more striking. The growth indicator for the sector's added value shows average annual rates of 4.4 percent for Type 1 and only 1.2 percent for Type 3, a ratio of almost four to one.

Appendices D and E provide basic and supplementary information on the discussion in this subsection. Tables D.1 through D.5 and graphs E.1 and E.2.B and C are particularly illuminating.

Indebtedness

The prolonged recessionary period affecting overall and, to a lesser extent, agricultural production has unfortunately gone hand in hand with an extremely intense process of external indebtedness. These are the two most prominent features characterizing the recent past and the present state, and if they are put together and evaluated in relative terms, the findings are most instructive.

A simple indicator has been designed for this purpose. It illustrates the degree to which the total product resulting from the resource base in the countries of the region is committed, assuming that the product is regularly allocated in its entirety to pay the foreign debt. It is based on the simple ratio between real levels of gross domestic product and the foreign debt recorded for each period. The pattern is one of gradual, steady breakdown in recent years. In 1976, the product was sufficient to pay the debt 5.54 times (in other words, the debt was equal to eighteen percent of the product), but by 1982, it could have covered it only 1.89 times (the debt level was equal to fifty-three percent of the total gross domestic product). The exercise can also be done using the product of the agricultural sector as the "payment fund," instead of total GDP. This approach reinforces the picture of sustained deterioration, giving an even more graphic, dramatic picture of the pattern: in 1979, this hypothetical "fund" would have been enough to cover over one-third of the debt commitment, but only three years later, in 1982, it could cover barely one-fifth.

This situation clearly contributes to an understanding of the recessionary process outlined above. However, the extreme foreign indebtedness of the region, unprecedented in modern times, contributes even more. The debt level in the last calendar year (1982), nearly US$285 billion*, is nearly twice the 1979 level and four times the level in the mid seventies. However, the situation is in fact even more dramatic than these figures imply:

> The external situation is so paralyzing that, even if all the countries of Latin America were able to negotiate payment of their debt principal, there would not be enough resources to cover the interest. Over the next three years, the region will need to transfer US$35 billion per year for this item alone 3/.

This opinion does not appear to be overstated, given the following:

> In an address to the Sixth United Nations Conference on Trade and Development (UNCTAD), Clausen stated that loans in 1982 would not even be enough to cover interest payments on the debts.
>
> In the case of Latin America, he pointed out, loans had fallen from US$31 billion in 1981 to US$12 billion in 1982 4/.

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* The debt bill seems to grow with time, and not necessarily because new credits are being granted:

a) "The debt burden in the region has reached an almost inconceivable magnitude: 300 billion dollars, equivalent for example to 137 years of mineral exports from Chile, or 254 years of that country's industrial exports."

DELANO, Manuel, "América Latina. De Tumbo en Tumbo," Revista HOY, Santiago, Chile, May 18 to 24, 1983, pp. 29-30.

b) "...the foreign debt burden of nearly US$350 billion..."

DAREMBLUM, Jaime, "En Torno al Endeudamiento Externo," La Nación, San José, Costa Rica, Friday, October 14, 1983, p. 6.

3 DELANO, Manuel, op. cit., p. 29.

4 "Banco Mundial solicita más créditos para Tercer Mundo," La Nación, San José, Costa Rica, Friday, June 10, 1983, p. 3.

An examination of the repercussions of phenomena such as these lends an air of urgent necessity to the effort to distinguish and typify specific situations in a heterogeneous group of countries, such as those of Latin America and tne Caribbean. This is because, as is commonly known, the intensified process of external indebtedness has been concentrated in an astonishingly small number of countries of the region (and, it should be noted, in a small number of lending banks and countries).

Table D.6 of Appendix D provides synthesized data on the discussion in this subsection.

The External Sector and the Balance of Payments

It is in this context of recessionary deterioration that the debt burden has begun to weigh heavily, and it will continue to be felt into a future as distant as the countries of the region are able to renegotiate. In the preceding exercise, it was assumed that these debts and the interest on them (the so-called "debt service") could be amortized by paying out generic assets of real income, such as overall gross domestic product or value added of the agricultural sector. This, however, is not the case. Of necessity, the debts must be paid with legitimate, liquid resources in the form of international foreign exchange. This is why the generation of hard currency has now become so much more essential that it once was.

Obviously, all this brings into play the strategic need to design policies for managing the balance of payments and the external sector as a whole, based on an examination and evaluation of real performance in the recent past and in the present. Given the prevailing productive structures in the different types of countries of Latin America and the Caribbean, as discussed in another section of this paper ("Present State or Situation by Types of Countries"), it is practically inevitable for both short and long term expectations to be channeled toward the agricultural sector. In addition, the best means are being sought for achieving maximum growth and self-sustained development for this sector. Unless national policies and inter-American and international cooperation choose to discard today's objectives of improving the standard of living in rural areas, they must take on the challenge that is facing the sector today and will continue to be acute in coming years.

This is why no effort must be spared to rein in and even reverse the clearly visible process of breakdown of the region's balance of payments. By the middle of the past decade, the current account balance showed a deficit surpassing eleven billion dollars. During the second half of the decade, it climbed to an annual average that topped seventeen billion dollars, and by 1981, it had reached nearly thirty-nine billion dollars. Over the course of 1982, there appeared to be a slight rebound, for a final deficit of around thirty-three billion dollars, essentially a consequence of the import reductions imposed by recession.

As these undesirable trends in the external sector and balance of payments have advanced, the levels of official reserves of international exchange in the region have of necessity begun to slide. During the second half of the past decade, these reserves increased by an annual average of around four billion dollars, but in 1981 there was practically no change, and in 1982 the change was negative (reserves reduction) by around thirteen billion dollars.

At the same time, 1981 market transactions (exports and imports) on international markets, which contribute partially to the overall performance of the balance of payments, exhibited a strong increase of around sixty percent over the annual average for the second half of the seventies. However, the deficit in the trade balance (exports minus imports) grew by the same proportion, to a total of two billion dollars. In 1982, the trade balance began to recover, with a surplus of nearly eight billion dollars. Unfortunately, however, as was hinted above, this surplus was caused by a strong reduction in imports, rather than rising exports. In fact, exports were off by around ten percent, slipping to about eighty-nine billion dollars.

Graph E.3 in Appendix E compares changes over time of physical volume of exports and imports. It shows that exports exhibited relatively stronger growth than imports. Section A of Graph E.2 in the same appendix illustrates one of the structural characteristics of the countries of the region. This was mentioned above in the discussion of the role that agricultural exports must play in a favorable recovery process for an external sector heavily burdened by foreign debt. Graph E.3 moves beyond the behavior of physical volumes of manufactures, to examine export and import prices and the net outcome of interaction between the pertinent values of the two variables (quantity and prices). The following section, which closes this chapter, will analyze prices.

Prices and Terms of Trade

The above section discussed the events of 1982. However, efforts should now be made to change direction and close the wide gaps in the balance of payments in general, and more particularly, in the trade balance. This must be done by expanding exports, not by squeezing imports, over the medium and long term. Over the short term, it is essential to restructure the heavy burden of the foreign debt. This means that agricultural sectors in the different types of countries of the region, policy designers and implementers, and the international, inter-American and national agencies that provide technical and financial cooperation for relatively less developed countries must now present a united front. Together, with imagination and decisiveness, they must face a triple challenge: simultaneously to maintain and increase adequate nutritional levels for the growing populations in the countries of

the region*, provide an expanded, continuous supply of agricultural employment for rural subpopulations, and substantially improve the sector's contribution to generating foreign exchange, in order to begin surely and steadily closing the external sector gaps.

Various recent international gatherings have reflected the broad, growing interdependence between national economies and the state of the world economy. In fact, many of the ills presently affecting the region originated in this interdependence. In recent times, there has also been increasing acceptance of the equally broad and growing interdependence among the different sectors of the national economies themselves, and the profound importance of this fact. Today more than ever, both factors must be considered in designing and enforcing national policies, both comprehensive and sectoral, and policies for the international and inter-American communities, devised by the different agencies for technical and financial cooperation and for discussion and negotiation.

Terms of trade and shifting prices for basic commodities, and particularly for agricultural commodities, dramatically illustrate this fact. It is therefore unreasonable to expect or even to attempt a sure, steady rise in agricultural production and, indirectly, of agricultural exports, in the absence of adequate economic incentives (real prices, relative prices) or social incentives (improvement of general conditions of well-being in the rural

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* It should be recalled that, despite the proven truth of...

> ...the hypothesis that the countries as a whole have demonstrated balanced growth between population and food production, ...this conclusion is of little interest for several countries in which the rising food needs, regardless of the cause, are demanding imports difficult to finance.

KAMINSKY, Mario and COHAN, Hugo E., Notas y Análisis sobre Políticas Alimentario-Poblacionales en América Latina, Directorate of Analysis and Evaluation, IICA, Seminar "Análisis del Estado de Políticas Poblacionales en América Latina," IIE UN of Ecuador-UNFPA, Quito, Ecuador, November 1982, p. 22.

The same study shows that in 1978-80, eleven of the twenty-four countries included in the sample were unable to maintain the annual per-capita average food production that they had sustained in 1969-71. See Table B, Appendix B of the study. The same situation was found for nine of the twenty countries in the present study (Indicator DPR15APE) (Cf. Appendices A and B). This phenomenon was also recorded for 1981 in seven of the twenty countries (Indicator DPA22LIP) (Cf. Appendices A and B). In terms of groups of countries, these phenomena can be found for two of IICA's four geographic areas (Cf. Table 1, p. 16) and for one of the three types of countries (Cf. Table 4, p. 41).

areas) in all national contexts. However, very little can be done in this regard if the international community, and especially the industrialized, relatively more developed countries, choose to ignore, or even encourage, this type of trend and cycle behavior. It is a pattern that sharply deteriorates terms of trade in general, and more particularly, the prices of basic and agricultural commodities.

In short, the annual average current price indices for basic commodities for the countries of Latin America and the Caribbean rose during 1979 and 1980 (base year, 1980: 100), but then fell steadily throughout all eight quarters of 1981 and 1982. By the final quarter of 1982, the price levels, ranging from 64 to 74, were lower than those of 1978 for both the aggregate and the particular categories of "Foodstuffs" and "Agricultural Raw Materials." In all categories, the levels for the first five months of 1983 experienced a slight but steady rise, recovering 1978 levels by March/April. Note, however, that 1978 was a year of decline, with values falling from the 1977 peak, a time of recovery from the earlier mini-recession commonly associated with the "oil crisis."

As has been stated, these indicators reflect current prices. However, the market prices of major Latin American agricultural export products can be deflated by the unit value index of manufactured goods exported by industrialized countries. This produces an indicator of terms of trade and clearly highlights a much more pronounced and longer-lasting deterioration. The present phase of the cycle is witnessing a steady fall* from the high point of real recovery in 1977 (level 152), dipping to less than half this figure (level 74) for the third quarter of 1982, when the most recent data were available. In this case, the base index of 100 pertains to the year 1975. Thus, the level at the end of 1982 was still over twenty-five percent short of the 1975 mark.

The World Bank claims that 5/:

> ...the industrialized countries protect agriculture in order to maintain parity between farmer income and that of other workers.

It adds, however, that:

> This protection is extremely, although unnecessarily, costly, as it has propelled increases in agricultural production beyond economically justified levels and has seriously distorted international comparative advantage...

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* See Graph E.5, Appendix E.

5 THE WORLD BANK, World Development Report. 1982, Washington D.C., 1982, Chapter 1, "Overview," p. 4.

If both these assertions are true, it will prove very difficult, if not impossible, to devise effective, mutually advantageous solutions that will lead to the long awaited process of self-sustained recovery, both for the region and for the world at large.

The region is pursuing a goal of closing the external sector gap and bringing about a pronounced expansion of export income, especially for agricultural products. The achievement of these goals, however, depends on the behavior of the two variables generating them: quantities and prices. The world-wide recession and the restrictive measures associated with it (and others measures, of a more structural and permanent nature) are contracting external demand for the region's production in terms of quantity. For this and other reasons, both cyclical and structural, the terms of trade and the prices of basic and agricultural goods from Latin America and the Caribbean are also deteriorating.

Appendices D and E provide basic and supplementary information on the material in this section. Of particular interest are Tables D.7 through D.11 and Graphs E.3 through E.7. In Graph E.3, note particularly the information on comparative performance. First we find a slide in all indicators of exports and imports during the last complete year, 1982 (prices, quantities and consequently, values). The behavior at the beginning of the past decade is then compared with the beginning of this decade, and it can be seen that import prices rose more quickly than export prices for the sixteen non petroleum exporting countries of Latin America and the Caribbean that were included in the indices. At the same time, the indices show that physical export quantities grew more quickly than imports. Finally, notwithstanding all this, the resulting values display a net disadvantage of export growth.

In short this means that, if these and other characteristics hold steady, no added efforts to expand exports will provide a higher net balance of foreign exchange income through commercial trade. This failure will lead to great frustration, under the present conditions of "foreign exchange starvation" or lack of international liquidity for the region. This could justify certain world-wide initiatives and trends in favor of substantial increases in barter 6/ as a means of performing international transactions. In the case of the countries of Latin America and the Caribbean, the result could be support for and new benefits from efforts for inter-regional integration and trade 7/.

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6 TOBIN, Mary, "El Trueque, nuevamente como medio de comercio," La Nación, Sunday, October 9, 1983, Section B, p. 2.

7 In this connection, see "Estrategias y Políticas Regionales y Subregionales," in the field of food and food security. Cf. OAS-IICA, Seguridad Alimentaria para América Latina y el Caribe, Ministerial Meeting for Consultation on Food Policies and Strategies in Latin America and the Caribbean, IDB-Government of the Republic of Ecuador-CMA, Quito, Ecuador, April 1983, pp. 11-16.

THE STATE AND DYNAMICS OF IICA'S GEOGRAPHIC AREAS

The recent patterns of change as described in the preceding chapter are of a generalized nature and characterize the aggregate of the Latin American and Caribbean region. This type of up to date, introductory discussion of the present state or situation and change or dynamics in the region is essentially dictated by the availability of up to date data. In general, the more recent data are also more comprehensive or aggregate.

A more realistic approximation of the "State of Agriculture and Rural Development in Latin America and the Caribbean" requires a more precise analysis with specific basic data that divide up the general regional aggregate into meaningful analytical categories. In this paper, two types of breakdown have been selected for this purpose: by types of countries and by geographic areas. For reasons discussed below, in the breakdown by types of countries, the present state or situation is analyzed separately from change over time or dynamics, and the findings in these two categories are discussed in the next two chapters. The breakdown by geographic areas is covered in this chapter and is based on the official division of geographic areas used by the Inter-American Institute for Cooperation on Agriculture. The analysis contained in the sections of this chapter is focused both on present state and on change and dynamics, broken down into the three targeted topical fields (food and food security, the external sector, and employment, income and agriculture as a whole). The chapter ends with a summary section.

The analysis and discussion in the three subsections of this chapter are based essentially on the information given in Table 1, which summarizes the attributes of each of IICA's geographic areas for all the simple and synthetic indicators used and derived in the study. This is shown in the second division, which contains columns showing simple arithmetic averages by country. Columns in the third division compare these levels by taking a ratio, and footnotes indicate the relative magnitude of inter-area differences and their statistical significance as revealed by the pertinent tests.

Food and Food Security

Very few indicators of present state or situation fail to show high and statistically significant inter-area differences of means in this field, as specified below. Comparison of daily calorie needs and the food supply in 1977 shows a surplus food supply, except in the Andean area (5 percent deficit). Average annual per hectare cereal yields in 1981 were around seventeen quintals*, except in the Caribbean (12.5 Q). Legume and pulse yields ranged

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* 1 quintal (Q) = 100 kg.

TABLE 1. LEVELS AND COMPARISONS OF LEVELS OF INDICATORS
BY GEOGRAPHIC AREA OF IICA */

INDICATORS		MEANS				RATIOS OF MEANS					
ORDER NUMBER	DESCRIPTION	AREA 1	AREA 2	AREA 3	AREA 4	$\bar{X}_3/\bar{X}_1$	$\bar{X}_4/\bar{X}_1$	$\bar{X}_4/\bar{X}_3$	$\bar{X}_2/\bar{X}_1$	$\bar{X}_2/\bar{X}_3$	$\bar{X}_2/\bar{X}_4$
	FOOD AND FOOD SECURITY. Present state										
BUAØ1CPE	APPARENT ANNUAL CEREAL CONSUMP PER CAPITA	188.625	165.000	163.800	274.200	.868	1.454**	1.674***	.875	1.007	.602
BCOØ2CAL	% DAILY CAL REQ PER CAP COV BY SUPPLY	103.375	105.000	95.000	113.800	.919	1.101**	1.198***	1.016	1.105	.923
BDPØ3ROT	PROTEIN SUPPLY PER CAPITA PER DAY	58.000	53.950	57.700	82.400	.993	1.423***	1.433***	.929	.935	.653
BCOØ4CVA	COMB BY ANIMAL/VEG ORIGIN OF CAL SUPPLY	.171	.137	.220	.334	1.290	1.956**	1.517*	.806	.625	.412**
BDPØ5OVA	COMB BY ANIMAL/VEG ORIGIN OF PROT SUPPLY	.620	.540	.817	1.120	1.316	1.805*	1.371	.870	.661	.482
BRRØ6CER	AVG ANNUAL YIELD CEREALS QUINTALES/HA	16.875	12.500	17.400	16.600	1.031	.984	.954	.741	.718	.753
BRRØ7MNA	CORN YIELD KG/HA	1520.625	1257.500	1449.200	2531.800	.953	1.665**	1.747**	.827	.868	.497
BRRØ8ATU	ROOTS AND TUBERS YIELD KG/HA	7781.500	7589.500	9053.600	11808.400	1.163	1.517*	1.304	.975	.838	.643
BRRØ9ULS	PULSES YIELD KG/HA	693.875	629.500	759.000	824.000	1.094	1.188	1.906	.907	.829	.764
BRR1ØRIS	DRY BEANS YIELD KG/HA	651.625	605.000	827.400	813.800	1.270	1.249	.984	.928	.731	.743
BRL11EPA	COW MILK YIELD KG/ANIMAL	952.500	600.000	1145.200	1538.600	1.202	1.615***	1.344*	.630	.524	.390**
BRI12ATO	RECIP PER CENT FOOD IMP IN TOT MERCH IMP	.104	.049	.094	.095	.909	.915	1.006	.468*	.515	.512
BRP13CIC	RATIO CEREAL PROD NET CEREAL IMP	4.601	1.695	2.404	9.540	.514	4038.178***	3.968***	.362	.705	
BTE14ANA	RATIO FOOD AND ANIM EXP TO FOOD AND ANIM IMP	3.749	.921	3.187	3.271	.850	.873	1.027	.246	.289	.281
SIS03ALI	SYN IND STATE FOOD AND FOOD SEC 1	-2.217	-5.430	-1.359	7.078						
SIS04ALI	SYN IND STATE FOOD AND FOOD SEC 2	-2.879	-4.786	-.917	7.128						
SISREALI	SYN SUMM IND STATE FOOD AND FOOD SEC	-.173	-.350	-.008	.484						
	FOOD AND FOOD SECURITY. Dynamics.										
DPR15APE	INDEX FOOD PROD PER CAPITA	102.375	94.000	101.600	108.000	.992	1.055	1.063	.918	.925	.870
DCD161CA	GROWTH CALORIE SUPPLY PER CAPITA PER DAY	1.053	1.070	1.099	1.030	1.044	.979	.938	1.016	.974	1.038
DCD171PC	GROWTH PROTEIN SUPPLY PER CAPITA PER DAY	1.028	1.020	1.050	1.026	1.022	.999	.978	.992	.971	.994
DTC18ACE	% AVG ANNL GROWTH RATE CEREAL AREA	1.480	6.450	.020	1.000	-.013	.672	-58.000	4.336	-322.500	6.450
DTC19REC	% AVG ANNL GROWTH RATE CEREAL YIELD	1.538	.600	3.260	1.800	2.120	1.171	.552	.390	.184	.333
DTP2ØCER	% AVG ANNL GROWTH RATE CEREAL PROD	3.086	7.100	3.200	2.820	1.036	.913	.881	2.300	2.219	2.518
DPA21LIT	INDEX FOOD PRODUCTION	136.500	108.000	138.600	141.000	1.015	1.033	1.017	.791	.779	.766
DPA22LIP	INDEX FOOD PROD PER CAPITA	99.375	87.000	102.400	114.200	1.030	1.149*	1.115	.876	.850	.762
DVC23EAG	GROWTH OF % CEREAL CONSUMP TO FEED LIVESTOCK	1.549	65.238	1.691	.998	1.092	.644**	.590**	42.116***	38.575***	65.395***
DRC24ANV	GROWTH BEEF PRODUCTION	1.384	1.249	1.445	1.119	1.045	.809	.774	.903	.864	1.116
DCR25ORN	GROWTH CORN YIELD	1.212	.988	1.100	1.261	.908	1.040	1.062	.815	.832	.783
DCR26ERT	GROWTH ROOTS AND TUBERS YIELD	1.044	1.005	.993	1.030	.952	.987	1.037	.903	1.012	.976
DCR27LES	GROWTH PULSES YIELD	1.046	1.073	1.259	1.019	1.204	.974	.809*	1.025	.852	1.053
DCR28EFB	GROWTH DRY BEANS YIELD	1.052	1.070	1.583	1.010	1.505***	.961	.638***	1.017	.676	1.059
DCR29ELE	GROWTH COW MILK YIELD	1.094	1.013	1.004	1.024	.918	.936	1.020	.926	1.009	.989
DIC3ØECE	GROWTH RATIO CEREAL IMP TO CEREAL EXP	16.423	2.445	1.807	30.205	.110	1.839	16.720*	.149	1.353	.081
DTE31DNAL	GROWTH RATIO FOOD AND ANIM EXP TO IMP	.847	.820	.966	.620	1.141	.733	.642	.968	.848	1.321
DRP021AT	RATIO FOOD IMP AS % TOT MERCH IMP	.972	.773	.883	1.730	.909	1.781*	1.959*	.796	.875	.447
DIS89ALI	SYN IND DYNAMICS FOOD AND FOOD SEC 1	-.157	-3.203	1.678	-.146						
DIS90ALI	SYN IND DYNAMICS FOOD AND FOOD SEC 2	-.474	2.784	1.707	-1.921						
DISREALI	SYNTH SUMM IND DYNAMICS FOOD AND FOOD SEC	-.030	-.825	.164	-.180						
	THE EXTERNAL SECTOR. Present state.										
BCE32ERR	RATIO GOODS AND SERV EXP TO DEBT SERV	11.682	15.812	6.430	6.131	.551	.525	.952	1.353	2.456	2.579
BAD33ENP	DEBT SERV AS % OF GROSS NAT PROD	4.425	4.500	4.640	2.740	1.049	.619	.591	1.017	.970	1.642
BMC34IRE	MONTHS IMP COV WITH GROSS INT EXCH RES	2.143	.700	7.840	7.780	3.659***	3.631**	.992	.327	.089**	.090**
BCE35TIA	RATIO OF TOT EXP AND AGRIC IMP	7.760	3.045	9.856	10.430	1.269	1.343	1.058	.392	.309	.292
BXP36RIT	PRIM SCTR MANUF EXP AS % TOT MANUF EXP	69.125	33.500	36.000	56.800	.521**	.822	1.578	.485	.931	.598
BRE37INP	RATIO TOT AGRIC EXP TO TOT AGRIC IMP	3.895	.396	1.687	5.4[illegible]	.433	1.402	3.237*	.102	.235	.073**
BRA38EID	RATIO ANNL AVG IDB AGRIC LOANS TO AGRIC GDP	.923	.577	.534	.29[illegible]	.649	.364**	.560	.701	1.000	1.929
SIS05BAL	SYN IND STATE BAL PAYMTS AND EXT SECT 1	-.343	-2.326	-.402	1.800						
SIS06BAL	SYN IND STATE BAL PAYMTS AND EXT SECT 2	.893	-1.846	-1.667	.976						
SISREBAL	SYN SUMM IND STATE BAL PAYMTS AND EXT SECT	.051	-.380	-.188	.260						
	THE EXTERNAL SECTOR. Dynamics.										
DRE39RGE	CHANGE IN RATIO GOODS SERV EXP TO DEBT SERV	.772	.708	.575	1.135	.744	1.470	1.975	1.020	1.371	.694
DRE40DPE	GROWTH OF PUBLIC EXT DEBT BALANCE	8.679	8.406	7.851	5.965	.905	.687	.760	.970	1.081	1.423
DRI41MPI	GROWTH OF RATIO TOTAL IMPORTS TO GDP	1.180	1.478	1.193	1.310	1.005	1.103	1.098	1.245	1.239	1.129
DRE42AIM	GROWTH OF RATIO TOT AG EXP TO TOT AG IMP	1.027	.539	.467	1.173	.455**	1.142	2.509**	.525	1.152	.459
DRE43XIM	GROWTH OF RATIO GOODS AND SERV EXP TO IMP	1.020	.836	.747	1.110	.732	1.089	1.487	.819	1.119	.752
DRE44PEO	GROWTH PRIM SCTR MERCH EXP AS % TOT MERCH EXP	.759	.439	.588	1.638	.774	2.159	2.788	.579	.747	.268
DEX45PCE	GROWTH CEREAL EXPORTS	.487	1.000	1.647	1.084	3.384**	2.227	.658	2.055	.607	.922
DIM46PCE	GROWTH CEREAL IMPORTS	3.939	2.445	2.137	2.020	.542	.513	.945	.621	1.144	1.210
DIS91BAL	SYN IND DYNAMICS BAL PAYMTS AND EXT SECT 1	-.184	-1.365	-1.398	2.238						
DIS92BAL	SYN IND DYNAMICS BAL PAYMTS AND EXT SECT 2	-.061	-.1688	-.610	1.389						
DISREBAL	SYN SUMM IND DYNAMICS BAL PAYMTS AND EXT SECT	-.021	-.245	-.158	.284						
	EMPLOYMENT, INCOME AND AGRICULTURE AS A WHOLE. Present state.										
BDE47POB	POPULATION DENSITY H/KM^2	72.941	206.403	18.004	12.822	.248*	.176*	.709	2.834*	11.413**	16.098**
BPF48ATO	RECIP AGRIC LAB FORCE AS % TOT LAB FORCE	2.493	3.057	3.165	5.848	1.270	2.200**	1.733*	1.226	.966	.557
BPR49UTO	RECIP RURAL POP AS % OF TOT POP	2.003	1.542	3.111	4.314	1.553	2.154***	1.387	.770	.496	.357**
BTC5ØPHC	HECTARES CROPPED LAND PER CAPITA	.338	.150	.360	.660	1.067	1.956**	1.833*	.444	.417	.227**
BPT51CUT	% ECONOMIC LAND IN CROPS	20.250	41.000	6.800	10.200	.336**	.504*	1.500	2.025	6.029**	4.020*
BPT52IIO	% CROPPED LAND IRRIGATED	8.000	10.000	14.000	7.600	1.750	.950	.543	1.250	.714	1.316
BPT53ISI	PROPORTION TOTAL IRRIGATED AREA	1.734	2.794	.718	.616	.414	.355	.857	1.611	3.889	4.538
BIN54TRA	AVG TRACTOR DENSITY PER THOU HA	4.738	5.250	3.500	6.860	.739	1.448	1.960	1.108	1.500	.765
BIN55FER	FERTILIZER CONSUMPTION PER CROPPED HA	70.625	47.000	30.200	27.200	.428	.385	.901	.666	1.556	1.728
BRU56ANA	CATTLE PER HA OF PERM MEADOWS & PAST	1.273	1.814	.573	.480	.450**	.377**	.839	1.425	3.168*	3.776*
BCU57TAC	RATIO LAND PERM CROP/ARABLE LAND	28.260	45.024	24.868	15.966	.869	.558	.642	1.601	1.843	2.070
BCU58TAP	RATIO LAND PERM MEADOWS & PAST/ARABLE LAND	245.778	98.002	633.594	664.910	2.578*	2.705*	1.049	.399	.155*	.147**
BCU59CUP	RATIO PERM MEADOWS & PAST/TOT AREA PERM CROP	1086.539	249.788	4672.814	5705.650	4.301*	5.251**	1.221	.230	.054	.044**
BPE6Ø/AFT	AGROFOREST ENERGY AS % TOTAL ENERGY CONS	49.155	47.375	19.736	28.028	.402***	.570**	1.420	.964	2.400	1.690
BPA79GTO	AGRIC GDP AS % OF TOTAL GDP	21.000	8.000	14.600	14.250	.695	.679	.976	.381	.548	.561
BMA8Ø/GTO	FOOD AND AGRIC MANUF AS % TOT MANUF	46.750	50.000	26.000	21.600	.556*	.462*	.831	1.070	1.923	2.315
SIS87AGR	SYN IND STATE EMPLY INCM AND AGRIC 1	-3.083	-8.225	3.053	5.178						
SIS88AGR	SYN IND STATE EMPLY INCM AND AGRIC 2	-3.289	-7.270	2.107	6.063						
SISREAGR	SYN SUMM IND EMPLY INCM AND AGRIC	-.279	-.680	.226	.492						
	EMPLOYMENT, INCOME AND AGRICULTURE AS A WHOLE. Dynamics.										
DRC61FAT	AGRIC LABOR FORCE AS % TOT LABOR FORCE	1.463	1.469	1.508	1.580	1.031	1.080	1.048	1.004	.974	.930
DRC62PRT	RURAL POP AS % TOTAL POP	1.239	1.143	1.529	1.406	1.234*	1.135	.920	.923	.748	.813
DRT63CPO	RECIP % ANNL AVG POPULATION GROWTH RATE	.400	.500	.430	.708	1.075	1.770***	1.647***	1.250	1.163	.706
DRC64PCP	CHANGE % ANNL AVG POPULATION GROWTH RATE	1.033	.908	1.066	1.575	1.032	1.525	1.477	.879	.851	.576
DVI65APE	GROWTH AGRIC INCOME PER AGRIC POPULATION	1.157	1.150	1.278	1.494	1.105	1.292**	1.170	.994	.900	.769
DVI66PHC	GROWTH PER CAPITA INCOME	1.203	1.042	1.297	1.412	1.079	1.174	1.089	.866	.803	.737
DPA67ORT	TOTAL AGRICULTURAL PRODUCTION INDEX	136.125	107.500	138.000	138.200	1.014	1.015	1.001	.790	.779	.778
DPA68JPE	TOTAL AGRIC PROD INDEX PER CAPITA	99.250	87.000	101.800	112.400	1.026	1.133*	1.104	.877	.855	.774
DTC69PRA	ANNL AVG GROWTH RATE AGRIC GROSS DOM PROD	2.725	.1450	2.840	3.380	1.042	1.240	1.190	.532	.511	.429
DDI7Ø/CAT	DIF AGRIC GDP AND TOTAL GDP GROWTH RATES	-1.763	.000	-2.575	-1.640	1.461	.931	.637	.000	.000	.000
DTC71PIA	% GROWTH RATE OF AGRIC GDP	3.113	-.750	3.940	3.040	1.266	1.234	.975	-.241	-.190	-.195
DTC72ATO	DIF AGRIC GDP AND TOT GDP % GROWTH	1.575	-.400	1.720	2.800	1.092	1.778	1.628	-.254	-.233	-.143
DCS73AIR	GROWTH IRRIGATED AGRICULTURAL AREA	1.857	1.218	1.263	1.507	.681	.812	1.193	.656	.964	.808
DCA74EVA	GROWTH CATTLE STOCKS	1.335	1.330	1.306	1.219	.979	.913	.933	.996	1.018	1.091
DCR75EGA	GROWTH CHICKEN STOCKS	1.561	1.351	2.329	1.690	1.493**	1.083	.726*	.866	.580	.799
DCS76UFA	GROWTH ARABLE LAND SURFACE	1.080	1.065	1.190	1.126	1.102	1.043	.946	.986	.895	.946
DCS77UTP	GROWTH AREA IN PERM CROPS	1.080	1.124	1.080	1.119	1.000	1.036	1.036	1.040	1.040	1.004
DCS78UPA	GROWTH AREA IN PERM MEADOWS AND PAST	1.026	.845	1.028	1.045	1.002	1.018	1.017	.823	.822	.808
DRP81AGT	RATIO AGRIC GDP AS % TOTAL GDP	.764	.800	.682	.603	.892	.906	1.016	1.047	1.173	1.154
DIS93AGR	SYN IND DYNAMICS EMPLY INCM AND AGRIC 1	-.760	-6.139	1.319	2.351						
DIS94AGR	SYN IND DYNAMICS EMPLY INCM AND AGRIC 2	-1.622	-5.903	.351	4.514						
DISREAGR	SYN SUMM IND DYNAMICS EMPLY INCM AND AGRIC	-.150	-.780	.108	.416						
SISREGEN	GENERAL SUMMARY SYNTHETIC INDICATOR. St.	-.133	-.470	-.014	.412						
DISREGEN	GENERAL SUMMARY SYNTHETIC INDICATOR. Dyn.	-.066	-.350	.038	.112						

* Significant Difference at a Level of .10
** Significant Difference at a Level of .05
*** Significant Difference at a Level of .01

(___) Underlined ratios indicate differences in means among areas that are greater than or equal to one-third or 33%
(1.333 _ ratio _ .750)

Underlined ratios with asterisks indicate high and statistically significant differences among area means.

*/ Area 1, Central: COS, ELS, GUA, HON, MEX, NIC, PAN, REP; Area 2, Caribbean: HAI, JAM; Area 3, Andean: BOL, COL, ECU, PER, VEN; Area 4, Southern: ARG, BRA, CHI, PAR, URU.

from six to eight quintals per hectare in 1981. Food and animal exports maintained over a three to one ratio with imports in 1980, except in the Caribbean (one to one).

On the other hand, many indicators of change or dynamics fail to show high and statistically significant inter-area differences of means, as we will see. The annual average index (base 1969-71: 100) for 1978-80 for per capita food production made modest progress during the decade, again with the exception of the Caribbean area, which showed a six percent decline. There was an overall modest increase in daily per capita calorie intake, which grew faster than protein intake. During the past decade, cereals saw increased land area, higher yields, and improved production, which rose at an annual average rate of three percent. Total food crop production expanded by around thirty-three percent during the past decade, although per capita food production either made very little progess or suffered a severe decline (-13 percent in the Caribbean) during the period*. Total beef production also grew at approximately the same pace as food production in general. Corn yields rose by around twenty percent during the decade, while yields of roots and tubers, pulses and cow milk grew much more slowly (in general around five percent). Finally, the ratio between food and animal exports and food and animal imports fell in almost all areas during the second half of the past decade (from -3.4 percent to -38.0 percent).

These findings reflect a high degree of inter-area homogeneity in terms of movement, change or dynamics, together with highly heterogeneous structures and differences in the present state or situation in the field of food and food security. The following discussion will examine those findings that show high and statistically significant differences among areas. The analysis will serve the double purpose of illustrating the current situation in order to round out the present discussion, and tracing the unique, distinctive features of each of IICA's geographic areas.

Area 4, Southern

Indicators of present state or situation show the following: maximum apparent annual per capita cereal consumption (274 kg); maximum daily per capita protein consumption (83 gr); maximum levels of animal products by comparison with vegetable products, as a proportion of total calorie intake (.33 to 1) and protein intake (1.12 to 1); maximum annual per-hectare yields of corn (25 Q) and roots and tubers (118 Q) and of cow milk per animal (1,539 kg); maximum ratio between cereal production and net cereal imports (10 to 1); and maximum values of the two pertinent synthetic indicators and consequently, of the summary synthetic indicator which averages the two.

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* Index for 1981: 87; base, 1969-71: 100.

The indicators of change or dynamics show the following: minimum growth during the past decade of the proportion of total cereal consumption used to feed livestock (zero percent); minimum growth of pulse yields during the decade (one percent); due to an exceedingly low rate during 1969-71, maximum growth in the ratio of cereal imports to exports in 1979-81 (30 to 1); maximum growth in food imports as a proportion of total imports (1.73 to 1) in 1979 by comparison with 1960, a year which experienced an extremely low rate; and a minimum value of the pertinent summary synthetic indicator.

Area 3, Andean

The indicators of present state or situation show minimum apparent per capita annual cereal consumption (164 kg); low per capita daily protein intake (58 gr); low annual corn yield per hectare of land (14 Q); and high values for the two pertinent syntnetic indicators, and consequently, for tne summarized synthetic indicator which is the average of the two.

The indicators of change or dynamics show maximum growth during the decade in the pulse yield (58 percent); minimum growtn from 1969-71 to 1979-81 in the ratio of cereal imports to cereal exports (1.81 to 1); slow growtn from 1960 to 1979 in food imports as a proportion of total imports (.88 to 1); and a maximum value for tne pertinent summary syntnetic indicator.

Calculations based on United States Department of Agriculture estimates 8/ can be used to supplement this information for the Andean area, with forecasts for the immediate future. Such an analysis for the four countries of the area "traditionally dependent on food aid donations" 9/ snows a population of sixty-one million inhabitants (1982-1983) and projected per capita food import requirements for 1982-83, expected to reach eight dollars if the status quo is maintained and nine dollars to meet real nutritional requirements. For 1983-84, these import requirements will climb to eight and one-half dollars to maintain the status quo and nine and one-half dollars to meet nutritional needs. For 1982-83, projected requirements for food aid will total around one dollar per person to maintain the status quo, while over two

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8 Tipificación de Países de América Latina y el Caribe según su Estructura y Dinámica Alimentaria y Agrícola, appendix to the document:

OAS-IICA, Seguridad Alimentaria para América Latina y el Caribe, Ministerial Meeting for Consultation on Food Policies and Strategies in Latin America and the Caribbean, Quito, Ecuador, April 1983, Table 3, p. 28.

9 USDA. ERS, World Food Aid Needs and Availabilities. 1982, Washington, D.C, April 1982.

dollars will be needed to meet nutritional requirements. For 1983-84, these projections rise to around twenty cents in the former case, and almost two dollars in the latter. On a scale of per capita estimated food needs, these four countries occupy an average thirty-sixth place out of a total of sixty-seven countries.

Area 2, Caribbean

The indicators of present state or situation reflect a minimum proportion of animal products in total calorie intake, by comparison with vegetable products (.14 to 1); low annual per-animal yield of cow milk (600 kg); maximum ratios of food imports to total imports (20 percent); minimum ratios between net cereal production and net cereal imports (1.7 to 1); and minimum values of the two pertinent synthetic indicators, and consequently of the summary synthetic indicator, an average of the two.

The indicators of change or dynamics show maximum growth over the past decade of the proportion of total cereal consumption that is used to feed livestock (65 times greater) and a high value of the pertinent summary synthetic indicator.

Calculations based on United States Department of Agriculture 10/ estimates supplement the information on this field in the Caribbean with predictions for the immediate future. For three countries of the Caribbean, "traditionally dependent on food aid donations," 11/ we find a population of fourteen million (1982-83). Per capita food import requirements for 1982-83 are expected to total sixteen and one-half dollars if the nutritional status quo is maintained, and twenty-two dollars to meet real nutritional needs. For 1983-84, these requirements leap to eighteen dollars to maintain the status quo and twenty-four dollars to meet needs. The outlook for per capita food aid requirements for 1982-83 is four and one-half dollars to maintain the status quo and over nine dollars to meet nutritional needs. For 1983-84, these figures climb to five dollars for the status quo and ten and one-half dollars to meet needs. Of sixty-seven countries, the average for these countries would occupy thirty-ninth place in terms of estimated per capita need for food aid.

Area 1, Central

The indicators for the present state or situation show that animal protein provides a low proportion of total protein consumption, by comparison

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10 Tipificación, op. cit.

11 USDA. ERS, op. cit.

with plant-based protein (.62 to 1); roots and tubers have low annual yields per hectare (78 Q); food imports represent a minimum proportion of total imports (10 percent); and low values are posted for the two pertinent synthetic indicators and consequently for the summary synthetic indicator which is an average of the two.

Indicators of change or dynamics produce a low value for the summary synthetic indicator.

Calculations based on the estimated data cited above show the following: for five countries of the Central area "traditionally dependent on food aid donations," the total population (1982-83) is twenty-two million. Per capita food import requirements for 1982-83 are seven dollars to maintain the nutritional status quo, and eight dollars to meet real nutritional requirements. For 1983-84, these needs rise to eight and one-half dollars and nine dollars, respectively. Expected needs for per capita food aid for 1982-83 are three dollars to maintain the status quo and four dollars to meet nutritional needs. For 1983-84, the figures are approximately the same as for 1982-83. The average range of these five countries in the scale of sixty-seven countries is thirty-ninth place in terms of relative estimated need for per capita food aid.

The External Sector

The general conditions of the countries of Latin America and the Caribbean can be described in terms of those indicators in this field that fail to reflect at least one high and statistically significant difference in means among the areas, as we will see in this section.

An examination of indicators of present state or situation shows that, at the beginning of this decade, annual exports of goods and services were generally enough to cover from six to sixteen times the annual debt service. The situation was most difficult in the Andean area and the Southern area, and less crucial for the Caribbean and Central areas. At that time, the debt service was equivalent to around three to five percent of the total gross national product. Total agricultural imports accounted for ten percent (Southern) to thirty-three percent (Caribbean) of total export values.

Indicators of change or dynamics show that during the decade, the first indicator mentioned above (annual exports to cover debt service) was already in a sharp decline of around twenty-five percent. At the same time, all the areas showed a marked deterioration reflected in the growing balance of the public foreign debt, which in general increased eightfold during the period. In all areas, the ratio of total imports to total gross domestic product grew from twenty percent to fifty percent from 1970 to 1981, another sign of significant deterioration. The ratio between exports and imports of goods and

services in general rose slightly from 1970 to 1981 in the Central and Southern areas and slipped around twenty percent in the other two areas. During the past two decades, exports from the primary sector (excluding fuel, minerals and metals) declined significantly as a proportion of total exports, ranging from twenty-five to fifty percent. The exception was the Southern area, where they rose sixty-four percent. Finally, cereal imports doubled and even quadrupled from 1969-71 to 1979-81.

The picture can be completed with an analysis of the indicators that show high and statistically significant differences in means among the areas. This is also useful for describing the different geographic areas, as we will see below.

Area 4, Southern

Indicators of present state or situation show maximum ratios between agricultural exports and agricultural imports during 1981 (over 5 to 1); a minimum ratio between the annual average of agricultural loans from the Inter-American Development Bank over the past two decades, and the agricultural gross domestic product at the beginning of the present decade (0.3 percent); and maximum values for the two pertinent synthetic indicators and for the summary synthetic indicator, which is an average of the two.

Indicators of change or dynamics show maximum growth from 1976 to 1981 of the ratio between agricultural exports and agricultural imports (17 per cent) and a maximum value for the pertinent summary syntnetic indicator.

Area 3, Andean

Indicators of the present state or situation show that toward the close of the past decade, gross international currency reserves were adequate to cover a maximum period of imports (eight months); also toward the end of the decade, primary sector exports (excluding fuel, minerals and metals) were a low proportion of total exports (36 percent); and there were low values for the two pertinent synthetic indicators and consequently, for the summary synthetic indicator which is an average of the two.

Indicators of change or dynamics show maximum declines from 1976 to 1981 in the ratio between agricultural exports and agricultural imports (over 50 percent); maximum growth of cereal exports over the past decade (65 per cent); and a low value for the pertinent summary synthetic indicator.

If we repeat the type of calculation performed for this group of countries in the above section (see notes 8/ and 9/ on page 18), we can supplement the information on the Andean area in this field, with forecasts for the immediate future. Indicators for 1983 show two hundred dollars in exports per capita and two hundred fifteen dollars per capita for imports. Foreign exchange reserves are one hundred twenty-five dollars per capita, with a per

capita debt service of forty-eight dollars. The ratio of exports to debt service shows that exports can cover the debt four times, while exchange reserves are sufficient to cover seven months of imports.

Area 2, Caribbaan

Indicators of present state or situation show a minimum ratio between agricultural exports and agricultural imports in 1981 (less than 0.4 to 1); minimum coverage of imports (less than one month) with gross international exchange reserves toward the close of the past decade; and minimum values of the two pertinent synthetic indicators and, consequently, of the summary synthetic indicator which is an average of the two.

Indicators of change or dynamics show a minimum in the pertinent summary synthetic indicator.

The type of calculations indicated in the previous section (see notes 10/ and 11/ on page 19) for the same countries supplement the information on this field for the Caribbean by providing forecasts for the immediate future. Indicators of per capita exports for 1983 total one hundred ninety dollars, and imports show two hundred sixty dollars. Foreign exchange reserves total eighteen dollars per capita, with a per capita debt service of thirty-two dollars. The ratio of exports to debt service shows that the debt can be covered almost six times by exports, while exchange reserves cannot cover even one month of imports.

Area 1, Central

Indicators of present state or situation show a maximum ratio between the annual average of IDB agricultural loans over the past two decades and the agricultural gross domestic product at the beginning of the present decade (0.8 percent); a maximum ratio of primary sector exports (excluding fuel, minerals and metals) to total commodity exports at the close of the past decade (69 percent); and high values for the two pertinent synthetic indicators and the summary synthetic indicator, which averages the two.

Indicators of change or dynamics show maximum declines of cereal exports (over 50 percent) over the past decade and a high value for the pertinent summary synthetic indicator.

The type of calculation performed in the previous section for these countries (see the information on the Central area in the preceding section) can be used to supplement information on this subject for the area, with forecasts for the immediate future. Per capita export indicators for 1983 total two hundred forty dollars, with two hundred seventy dollars for imports. Per capita foreign exchange reserves are twenty-seven dollars, with a per capita debt service of thirty-six dollars. The ratio of exports to the debt service shows that the debt can be covered almost seven times by exports, while exchange reserves are sufficient to cover a little over one month of imports.

Employment, Income and Agriculture as a Whole

The study examined six possible inter-area differences of means. Nearly forty percent of the indicators of present state or situation in this field failed to produce at least one difference that was high and statistically significant. These six indicators will be discussed below, to provide a general summary picture of the situation in this realm in the countries of Latin America and the Caribbean.

Irrigated land occupies eight to fourteen percent of total land under cultivation (1978) and one to three percent of total land (1980). Other indicators of land use intensity show an average of five tractors per thousand hectares and from twenty-five to seventy kilograms of fertilizer per hectare (both for around 1978). Land used for permanent crops bore a ratio to total arable land ranging from 0.16 to one (Southern) to 0.46 to one (Caribbean). Finally, at the beginning of this decade, the agricultural gross domestic product was around fifteen percent of the total gross domestic product.

In this field, seventeen of the nineteen indicators of change or dynamics failed to reflect at least one high and statistically significant difference of means among areas, as will be seen. In the first place, there was a steady, distinct decline in the agricultural labor force as a proportion of the total labor force, totalling almost forty percent over the past two decades. The same can be found for the rural population as a proportion of total population in the Andean and Southern areas, with a much less conspicuous decline in the Central and Caribbean areas (around 10 to 20 percent). From 1970 to 1981, per capita income for the agricultural population grew between fifteen percent (Caribbean and Central) and fifty percent (Southern). However, this is nothing more than a reflection of increases in general per capita income, which grew by the same percentages.

At the same time, the total agricultural production index during the period grew thirty-seven percent, with the exception of the Caribbean area, where only seven and one-half percent was posted. The indicator can be compared with population growth figures to give per capita estimates. This shows relatively modest growth (Andean and Southern), stagnation (Central) or clear deterioration (Caribbean, -13 percent). An evident factor in this is the average annual population growth, with slightly declining trends from 1960-70 to 1970-80 (except in the Southern area, with a nearly forty percent slide) or a clear increase (Caribbean, 10 percent).

The agricultural gross domestic product showed an annual average growth rate of around three percent during the past decade and in 1981, with the exception of the Caribbean area (+1.5 percent in the past decade and -0.8 percent, in 1981). The differences between total gross domestic product growth rates (1970 to 1980) and agricultural gross domestic product growth are unfavorable for agricultural growth, except in the Caribbean (no difference). Nevertheless, in 1981, this trend was reversed, again with the exception of the Caribbean (-0.4 percent difference).

Various growth indicators for nearly all the geographic areas during the past decade show positive increases ranging from under five percent (land surface area in permanent meadows and pastures) to over thirty and even fifty percent (cattle stocks, irrigated farm land). This includes such variables as arable land surface and land surface used for permanent crops.

Finally, the progressive changes in one particular indicator over the past two decades reveal that the relative importance of agriculture in the overall economy of the countries of Latin America and the Caribbean has generally declined. The proportion of the agricultural domestic product in the total gross domestic product fell nearly twenty-five percent.

The description of this topical field, like those given above, will close with a discussion of the unique, distinctive features (maximum and minimum levels) of IICA's four geographic areas, reflected in indicators that produce high and statistically significant differences in means among areas.

Area 4, Southern

Indicators of present state or situation show a minimum population density (13 inhabitants per square km); a minimum share of the total labor force engaged in agriculture (around 18 percent) at the beginning of the present decade; in line with this, a minimum share of the total population living in rural areas, also at the beginning of this decade (around 23 percent); a maximum amount of land under cultivation per capita, considering the total population at the end of the past decade (two-thirds of one hectare); minimum head of cattle per hectare of permanent meadows and pastures at the beginning of this decade (0.48); a maximum ratio between land in permanent meadows and pastures and total arable land at the end of the past decade (6.65 to 1); a maximum ratio between land in permanent meadows and pastures and land used for permanent crops (57 to 1); a minimum level of the aggregate value of manufactures in food and agriculture as a proportion of total aggregate value of manufactures toward the end of the past decade (22 percent); and maximum values of the two pertinent synthetic indicators, and consequently of the summary synthetic indicator which is an average of the two.

The indicators of change or dynamics show a minimum annual average population growth rate for 1980-2000 (around 1.4 percent); maximum values for the two pertinent synthetic indicators, and consequently for the summary synthetic indicator, which is an average of the two.

Area 3, Andean

Indicators of present state or situation show that land under cultivation comprised a minimum proportion of the total economically useful land

(land under cultivation plus permanent meadows and pastures, forests and woodlands) by the close of the last decade (7 percent); products of agricultural and forest origin made up a minimum proportion of total energy consumption by the end of the past decade (20 percent); and high values were found for the two pertinent synthetic indicators and consequently, for the summary synthetic indicator, which is an average of the two.

Indicators of change or dynamics show maximum growth in chicken stocks during the past decade (133 percent) and high values for the two pertinent synthetic indicators, and consequently for the summary synthetic indicator which is an average of the two.

Area 2, Caribbean

Indicators of present state or situation show maximum population density (206 innabitants per square km); a maximum proportion of the total population living in rural areas at the beginning of this decade (65 percent); a minimum of land under cultivation per capita, considering the total population, at the close of the last decade (around 1/7 ha); a maximum amount of land under cultivation as a proportion of total economically useful land (land under cultivation plus permanent meadows and pastures, forests and woodlands) at the close of the past decade (41 percent); maximum head of cattle per hectare of permanent meadows and pastures, at the beginning of this decade (1.8); a minimum ratio between land in permanent meadows and pastures and arable land at tne close of the past decade (1 to 1); a minimum ratio between land in permanent meadows and pastures and land under permanent crops (2.5 to 1); and minimum values of the two pertinent synthetic indicators, and consequently, the summary synthetic indicator which is an average of the two.

Indicators of change or dynamics show minimum values for the two pertinent synthetic indicators and consequently, for tne summary synthetic indicator which is an average of the two.

Area 1, Central

Indicators of present state or situation show a maximum share of tne total labor force engaged in agriculture at the beginning of this decade (around 40 percent); maximum amounts of agroforest derived energy as a proportion of total energy consumption at the close of tne past decade (49 percent); hign aggregate value of manufactures in food and agriculture as a proportion of total aggregate value of manufactures at the close of tne past decade (47 percent); low values of the two pertinent synthetic indicators and consequently of the summary synthetic indicator which is an average of tne two.

Indicators of change or dynamics show a maximum average annual population growth rate for 1980-2000 (around 2.5 percent); low growth of chicken stocks over the past decade (56 percent); and low values for the two

pertinent synthetic indicators and consequently, for the summary synthetic indicator which is an average of the two.

Certain specific additional information on the Central area is summarized below. It has been included in the analysis in view of the peculiar structural characteristics of the countries in this area and the economic, social and political dynamics at work, and in consideration of recent initiatives being considered for this subregion. The problem of access to land and to income, and the related issue of campesino pressures, will have a major impact in all these fields.

In the first place, around the middle of the past decade, a severe imbalance emerged between land distribution and agricultural population. Eighty-four percent of the total agricultural population is made up of landless workers, microfundia farmers, and small and medium-sized minifundia farmers with up to seven hectares of land per farm. Nevertheless, only eleven percent of all land was in the hands of these groups. At the same time, nearly ninety percent of the land is held by sixteen percent of the population, working on family, medium-sized multifamily and large multifamily operations 12/.

An average of the countries shows that fifty-three percent of the total economically active population was engaged in agriculture in 1970, but by 1980 this had fallen to forty-six percent. Nineteen percent of this agricultural population made up the "modern sector," with twenty-seven percent in the "traditional sector" 13/. In general, the traditional sector is often associated with campesino agriculture. The limited data available show that on the average by country, this group provides around fifty-four percent of the total agricultural supply for domestic markets and twenty-eight percent of all exports 14/. A look at changes over time shows that during the past decade, real farm wages rose an average of thirty percent in three countries of the area and fell twenty-two percent in the other three countries 15/.

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12 Based on data from: FAO/SIECA, Perspectiva para el Desarrollo y la Integración de la Agricultura en Centroamérica, Guatemala, May 1974.

13 PREALC, Mercado de Trabajo en Cifras, 1950-1980, International Labour Organization, First Edition, Santiago, Chile, 1982, Part I, pp. 33-81. Summary calculations based on different tables by country.

14 Calculations based on information in ORTEGA, Emiliano, "La Agricultura Campesina en América Latina," Revista de la CEPAL, April 1982, No. 16, Section III, "Significación Económica de la Agricultura Campesina," pp. 84-92.

15 Calculations based on data in PREALC, op.cit., Part III, Table III-3, pp. 149-151.

Summary

Relatively few differences were found in the patterns of change among IICA's four geographic areas during approximately the last decade. Nevertheless, the present structural state or situation differs considerably, in important and statistically significant ways. These differences are most evident and numerous in the field of food and food security, less marked in the external sector, and even smaller for employment, income and agriculture as a whole. The major differences, both in dynamics and in present state or situation, have been discussed in the preceding subsections. Each area has been described, stressing its most characteristic features by giving maximum or minimum values for the four relevant averages.

In the field of food and food security, the situation is not dramatic in aggregate or average terms. However, dynamics in the recent past show a situation of near stagnation and clear indications of recession. In general, specific geographic areas have certain striking features. The Caribbean area stands out for its poor relative position in terms of present situation. The Southern area shows low levels of dynamism, a possible consequence of its clearly superior relative position in present state or situation. Finally, the Andean area shines for its very high dynamism which consistently shows through the most diverse indicators. The greatest source of concern in general is the behavior of indicators of food imports and particularly cereal imports, by comparison with total imports and domestic production. Still more serious are the sharp rises in the magnitude of these indicators over the last decade. These are warning signals that must be heeded.

The external sector and its relationship to agriculture have been plagued by deterioration for over a decade. It is common knowledge that in the early years of this decade, the situation went into serious decline. Aggregate figures for the region as a whole show severe and even dramatic commitments looming near, and bottlenecks will obstruct any recovery from the present situation of recession and economic crisis, and hamper efforts to bring about balanced, self-sustained development.

The following two sections will present information on the external sector by types of countries, to give a better idea of the nature of problems being faced. Here we will limit ourselves to brief comparisons by area. In the first place, the Southern area enoys a superior ranking in terms of both present state or situation and dynamics, while the Caribbean area is on the lowest rung, also in terms of both indicators. Of particular note in this connection is that in the Caribbean area, agricultural imports more than double exports. The same indicator shows a clear negative trend in the Andean area, with a drop of over fifty percent in the pertinent ratio during the second half of the last decade.

In the field of employment, income and agriculture as a whole, it was found that agriculture contributes a relatively low proportion of the total social product, and its proportion is falling. It is widely recognized that this is a reflection of the development process itself, with its focus on the structural characteristics of industrialized market economies. It is a process that is much less visible in the Central area and especially in the Caribbean. The overall situation is unequivocally more encouraging in the Southern area, especially in terms of relative availability of land and the lower population density and growth. The Andean area occupies a relatively high intermediate position, and there is a special potential to be tapped because only a low proportion of total economically useful land is now under cultivation.

Both the Central and the Caribbean areas are haunted by an infamous "land hunger," with high and growing population densities. This is the result of historically high population growth rates, especially in the Central area. In both areas, agriculture and the rural sector in general make a proportionally high contribution to the overall economy, and this contribution is slow to fall. Per capita agricultural production over the last decade has been steadily slipping in the Caribbean area, has stagnated in the Central area, and has made only modest progress in the Andean and Southern areas.

The preceding subsections can be consulted for details on particular behavior patterns and on specific geographic areas. This section will close by combining the overall synthetic or general summary indicators obtained by averaging the three summary syntnetic indicators for each of the three topical fields which have been briefly discussed. This operation tentatively establishes a rank order of the performance or relative conditions in the four geographic areas, both for present state or situation, and for change over time or dynamics, as follows: 1. SOUTHERN. 2. ANDEAN. 3. CENTRAL. 4. CARIBBEAN.

PRESENT STATE OR SITUATION BY TYPES OF COUNTRIES

General Description of the Types

As was seen in the general summary of the methodology, the first step in the process of typifying the countries was to classify them in a general ranking. This ranking was done separately for each of the major topical fields --food and food security, the external sector, and employment, income and agriculture as a whole. It placed the countries in order from best state or situation to worst, in terms of performance or conditions. The final composite typification combined these three separate sets of data and was based on the identification of an interesting pattern of behavior that had emerged. Low frequencies for present state were obtained for countries belonging to similar categories of performance or conditions in all three topical fields, while the reverse occurred with findings for change or dynamics, which produced the three uniform types of relative behavior patterns discussed in the next section.

In the first category of present state or situation were countries with high or good conditions in all three targeted topical fields. In a second group were countries with high or good conditions or performance in the two most closely related topical fields--food and food security and employment, income and agriculture as a whole, with low or poor conditions in the topical field of the external sector. In a third group are the countries with the reverse pattern--low or poor conditions or performance in food and food security and in employment, income and agriculture as a whole, but good or high relative conditions in the external sector. The typification process then proceded with these three basic matrix types to establish the final three types of general state or situation. These were entitled, in the order listed above, "Type 1," "Type 2" and "Type 3."

Table 2 below summarizes and expands upon the description of the attributes of each of these types or groups of countries. It presents all the simple and synthetic indicators that were employed and derived in the typification process by giving the simple arithmetic means per country in the second division of the table. The third division compares these levels by calculating their ratios, and footnotes indicate both the relative magnitude of intergroup differences and the statistical significance of these differences as found in the test results. Details can be found at the bottom of the table.

The general characterization of the three types of countries, as described above, is validated in the table, which gives the complete list of simple indicators broken down by topical field. This conclusion is summarized in the relative findings of the two synthetic indicators and the summary synthetic indicator of each of the three targeted topical fields, included at the bottom of each list.

TABLE 2. FINAL TYPIFICATION OF COUNTRIES BY PRESENT STATE.

LEVELS OF GROUP MEANS OF SIMPLE AND SYNTHETIC INDICATORS

OF STATE AND COMPARISONS BY RATIOS

INDICATORS		MEANS			RATIOS OF MEANS		
ORDER NUMBER	DESCRIPTION	GROUP 1	GROUP 2	GROUP 3	X_1/X_3	X_1/X_2	X_2/X_3
	FOOD AND FOOD SECURITY.						
SUA01CPE	APPARENT ANNUAL CEREAL CONSUMP PER CAPITA	281.000	211.444	160.375	1.751***	1.328*	1.318*
SCQ03CAL	% DAILY CAL REQ PER CAP COV BY SUPPLY	116.000	104.556	99.000	1.172	1.110	1.056
SDP01PRT	PROTEIN SUPPLY PER CAPITA PER DAY	93.833	62.733	53.725	1.736***	1.488***	1.168*
SCD04CVA	CONS BY ANIMAL/VEG ORIGIN OF CAL SUPPLY	.431	.201	.163	2.639***	2.141***	1.235
SDP05OVA	CONS BY ANIMAL/VEG ORIGIN OF PROT SUPPLY	1.477	.179	.602	2.451***	2.053***	1.193
SRR05CER	AVG ANNUAL YIELD CEREALS QUINTALES/HA	16.667	16.778	16.125	1.033	.993	1.041
SRR07MAA	CORN YIELD KG/HA	2231.667	1854.889	1399.500	1.595	1.203	1.325
SRR08ATU	ROOTS AND TUBERS YIELD KG/HA	12031.000	10065.111	6884.750	1.748**	1.195	1.462*
SRR09PUL	PULSES YIELD KG/HA	919.000	738.667	665.000	1.381**	1.244	1.111
SRR10TRI	DRY BEANS YIELD KG/HA	810.000	779.111	648.375	1.248	1.040	1.202
SRL11EPA	COW MILK YIELD KG/ANIMAL	1801.333	1064.889	906.375	1.988***	1.692***	1.175
SRI12ATO	RECIP PER CENT FOOD IMP IN TOT MERCH IMP	.107	.087	.096	1.112	1.224	.908
SRP13CIC	RATIO CEREAL PROD NET CEREAL IMP	69.370	3.210	4.065	16.949***	21.611***	.790
STX14MIA	RATIO FOOD AND ANIM EXP TO FOOD AND ANIM IMP	4;057	1.916	4.338	.935	2.119	.442*
EIS83ALI	SYN IND STATE FOOD AND FOOD SEC 1	10.701	-.300	-3.676	-2.907***	-35.714***	.082*
EIS84ALI	SYN IND STATE FOOD AND FOOD SEC 2	9.499	.077	-4.525	-2.101***	125.000***	-.017**
EIS85ALI	SYN SUM4 IND STATE FOOD AND FOOD SEC	.690	.012	-.280			
	THE EXTERNAL SECTOR.						
BCS32SER	RATIO GOODS AND SERV EXP TO DEBT SERV	7.783	5.416	14.480	.537	1.437	.374*
BSD33GNP	DEBT SERV AS % OF GROSS NAT PROD	1.700	6.122	2.638	.644	.278**	2.320**
BMC34IRE	MONTHS IMP COV WITH GROSS INT RESCH RES	10.267	5.089	2.063	3.584***	2.016**	1.776
BCE35TIA	RATIO OF TOT EXP AND AGRIC IMP	12.647	6.953	8.643	1.464	1.818	.805
EXP36RIT	PRIM SCTR AGRUF EXP AS % TOT AGRUF EXP	71.000	33.667	71.000	1.000	2.110**	.474**
RTX37IMP	RATIO TOT AGRIC EXP TO TOT AGRIC IMP	7.413	1.881	3.566	2.079	3.937***	.527
EPA38BID	RATIO ANNL AVG IDB AGRIC LOANS TO AGRIC GDP	.211	.552	.789	.267**	.382	.700
EIS85BAL	SYN IND STATE BAL PAYMTS AND EXT SECT 1	3.756	-1.831	.368	10.205**	-2.049**@	-4.975@@
EIS86BAL	SYN IND STATE BAL PAYMTS AND EXT SECT 2	2.896	-2.557	1.791	1.618	-1.133***	-1.429***
EIS87BAL	SYN SUM4 IND STATE BAL PAYMTS AND EXT SECT	.607	-.378	.199			
	EMPLOYMENT, INCOME AND AGRICULTURE AS A WHOLE.						
EDE47POB	POPULATION DENSITY M/KM^2	11.605	39.378	95.106	.122*	.295	.414
EPF48ATO	RECIP AGRIC LAB FORCE AS % TOT LAB FORCE	6.275	3.749	2.092	3.003***	1.672**	1.792**
EPR49UTO	RECIP RURAL POP AS % OF TOT POP	4.482	3.196	1.753	2.558***	1.403	1.821**
STC50PEC	HECTARES CROPPED LAND PER CAPITA	.800	.344	.325	2.463***	2.320***	1.059
EPT51CUT	% ECONOMIC LAND IN CROPS	10.000	10.333	25.750	.388*	.968	.401**
EPT521TO	% CROPPED LAND IRRIGATED	4.000	12.778	8.125	.492	.313	1.572
EPT531EI	PROPORTION TOTAL IRRIGATED AREA	.396	1.074	1.909	.208	.369	.563
EIN54TRA	AVG TRACTOR DENSITY PER THOU HA	7.767	5.556	3.363	2.309	1.399	1.653
EIN55FER	FERTILIZER CONSUMPTION PER CROPPED HA	11.667	44.667	63.625	.183	.261	.702
ENG56AHA	CATTLE PER HA OF PERM MEADOWS & PAST	.507	.644	1.470	.345**	.787	.438***
ECU57PAC	RATIO LAND PERM CROP/ARABLE LAND	20.069	17.341	38.562	.521	1.157	.450**
ECU58TAP	RATIO LAND PERM MEADOWS & PAST/ARABLE LAND	934.903	471.423	200.903	4.651***	1.984**	2.347*
ECU59CUP	RATIO PERM MEADOWS & PAST/TOT AREA PERM CROP	8135.889	3977.614	733.038	11.111***	2.045*	5.435**
EPH60AFT	AGROFOREST ENERGY AS % TOTAL ENERGY CONS	30.520	20.136	56.754	.538**	1.515	.355***
EPA79GTO	AGRIC GDP AS % OF TOTAL GDP	20.000	11.875	21.500	.930	1.684	.552**
EMA80GTO	FOOD AND AGRIC MANUF AS % TOT MANUF	26.333	28.429	48.333	.545	.926	.588*
EIS87AGR	SYN IND STATE EMPLY INC4 AND AGRIC 1	6.596	2.165	-4.909	-1.344***	3.409	-.441***
EIS88AGR	SYN IND STATE EMPLY INC4 AND AGRIC 2	7.713	2.309	-5.490	1.404***	3.344*	-.421***
EIS89AGR	SYN SUM4 IND EMPLY INC4 AND AGRIC	.627	.196	-.455			
DISSRGEN	GENERAL SUMMARY SYNTHETIC INDICATOR.	.640	-.056	-.179			

* Significant Difference at a Level of .10
** Significant Difference at a Level of .05
*** Significant Difference at a Level of .01

(___) Underlined ratios indicate differences in means among areas that are greater than or equal to one-third or 33% ($1.333 \leq$ ratio $\leq .750$)

Underlined ratios with asterisks indicate high and statistically significant differences among area means.

TABLE 3. GROUPINGS BY INDICATORS OF PRESENT STATE.

REAL LEVELS OF INDICATORS OF PRESENT STATE OF REAL COUNTRY TYPES IN EACH GROUP

INDICATORS		LEVEL OF INDICATOR		
ORDER NUMBER	DESCRIPTION	COUNTRY-TYPE 1 REAL	COUNTRY-TYPE 2 REAL	COUNTRY-TYPE 3 REAL
	FOOD AND FOOD SECURITY. Present State			
EUA01CPE	APPARENT ANNUAL CEREAL CONSUMP PER CAPITA	379.000	309.000	127.000
ECO02CAL	% DAILY CAL REQ PER CAP COV BY SUPPLY	124.000	113.000	102.000
EDP03ROT	PROTEIN SUPPLY PER CAPITA PER DAY	111.900	72.200	46.600
ECO04CVA	COMB BY ANIMAL/VEG ORIGIN OF CAL SUPPLY	.472	.167	.158
EDP05OVA	COMB BY ANIMAL/VEG ORIGIN OF PROT SUPPLY	1.976	.494	.643
ERR06CER	AVG ANNUAL YIELD CEREALS (QUINTALES/HA	23.000	18.000	30.000
ERR07MMA	CORN YIELD KG/HA	3857.000	1812.000	2083.000
ERP08ATU	ROOTS AND TUBERS YIELD KG/HA	16598.000	13048.000	9160.000
ERR09NLS	PULSES YIELD KG/HA	1016.000	752.000	990.000
ERP10RIS	DRY BEANS YIELD KG/HA	1052.000	683.000	264.000
ERL11EPA	COW MILK YIELD KG/ANIMAL	1856.000	782.000	1469.000
ERI12ATO	RECIP PER CENT FOOD IMP IN TOT AGRCH IMP	.143	.125	.059
ERP13CIC	RATIO CEREAL PROD NET CEREAL IMP	99.000	6.143	1.439
ETX14MMA	RATIO FOOD AND ANIM EXP TO FOOD AND ANIM IMP	7.878	.522	3.216
	THE EXTERNAL SECTOR.			
ECE32SER	RATIO GOODS AND SERV EXP TO DEBT SERV	6.024	3.135	4.651
END33GNP	DEBT SERV AS % OF GROSS NAT PROD	1.400	4.900	2.300
EMC34IRE	MONTHS IMP COV WITH GROSS INT RSCH RES	6.700	1.500	2.200
ECE35TIA	RATIO OF TOT EXP AND AGRIC IMP	25.000	5.880	5.260
EXP36RIT	PRIM SCTR MANUF EXP AS % TOT MANUF EXP	74.000	22.000	71.000
ETX37IMP	RATIO TOT AGRIC EXP TO TOT AGRIC IMP	12.794	4.304	3.257
EPA38BID	RATIO ANNL AVG IDB AGRIC LOANS TO AGRIC GDP	.178	.554	1.262
	EMPLOYMENT, INCOME AND AGRICULTURE AS A WHOLE.			
EDE47POB	POPULATION DENSITY M/KM^2	9.879	36.272	122.923
EPP48ATO	RECIP AGRIC LAB FORCE AS % TOT LAB FORCE	7.692	2.778	2.041
EPR49UTO	RECIP RURAL POP AS % OF TOT POP	5.556	3.030	2.041
ETC50/PEC	HECTARES CROPPED LAND PER CAPITA	1.300	.300	.200
EPT51CUT	% ECONOMIC LAND IN CROPS	15.000	14.000	32.000
EPT52ITO	% CROPPED LAND IRRIGATED	4.000	22.000	11.000
EPT53IEI	PROPORTION TOTAL IRRIGATED AREA	.577	2.652	2.997
EIN54TRA	AVG TRACTOR DENSITY PER THOU HA	5.700	6.700	2.400
EIN55FER	FERTILIZER CONSUMPTION PER CROPPED HA	3.000	46.000	51.000
LNG56AHA	CATTLE PER HA OF PERM MEADOWS & PAST	.389	.417	1.426
ECU57TAC	RATIO LAND PERM CROP/ARABLE LAND	39.810	7.005	39.778
ECU58TAP	RATIO LAND PERM MEADOWS & PAST/ARABLE LAND	571.430	343.640	170.350
ECU59CUP	RATIO PERM MEADOWS & PAST/TOT AREA PERM CROP	1428.600	5000.000	429.200
EPE60AFT	AGROFOREST ENERGY AS % TOTAL ENERGY CONS	5.600	18.190	46.777
EPA79GTO	AGRIC GDP AS % OF TOTAL GDP	*	10.000	18.000
EMA80GTO	FOOD AND AGRIC MANUF AS % TOT MANUF	20.000	20.000	72.000
	SYNTHETIC INDICATORS			
EIS81ALI	SYN IND STATE FOOD AND FOOD SEC 1	19.518	1.413	-.341
EIS84ALI	SYN IND STATE FOOD AND FOOD SEC 2	18.122	1.996	1.361
EIS85BAL	SYN IND STATE BAL PAYMTS AND EXT SECT 1	6.672	-1.536	-1.335
EIS86BAL	SYN IND STATE BAL PAYMTS AND EXT SECT 2	6.160	-2.291	.318
EIS87AGR	SYN IND STATE EMPLY INCM AND AGRIC 1	7.073	1.067	-6.099
EIS88AGR	SYN IND STATE EMPLY INCM AND AGRIC 2	9.749	1.114	-6.483

* Missing value

As was stated earlier, the material shown in Table 2 is essentially on group means. It describes countries in a relatively abstract fashion (averages). Table 3 supplements the information in Table 2 by giving the real equivalents for each type or group in the form of actual observations made of real countries representative of each type. In synthesis, it can be stated that while Table 2 contains systematic information on each of the three "types of countries," Table 3 reflects each of the "Country-Types." The figures in Table 3 reinforce the overall characterization of the three types, as briefly described above.

The information in these two tables, and especially the systematic data in Table 2, provide a basis for the discussion in the following sections. This discussion will give a more detailed analysis of the findings for each of the three targeted topical fields on which the study concentrates.

Food and Food Security

Of the fourteen simple indicators in this field, only five fail to show high and statistically significant differences in arithmetic means among groups. Three of these are indicators of average crop yields per unit of land: cereal (over 16 q/ha), corn (from 14 to 22 q/ha) and dry beans (6 to 8 q/ha). The fourth indicates how much of the daily calorie requirements are met by existing supply (1977), and in general shows satisfactory results or even a modest surplus. The fifth is food imports as a proportion of total imports, around ten percent.

The following breakdown will highlight the considerable intergroup heterogeneity in this field. It fills the double purpose of clarifying the situation as described above and underscoring the unique, distinctive (maximum or minimum) traits of each of the three general types or groups of countries, which have been distinguished on the basis of homogeneous conditions in the present state or situation.

Type 1

Characteristics include a maximum level of annual apparent cereal consumption per capita (281 kg); maximum daily protein supply per capita (93 gr); maximum ratios of calories derived from animals to calories derived from vegetables (0.43 to 1), and of protein derived from animals to protein derived from vegetables (1.48 to 1) in total consumption; maximum per hectare yields of roots and tubers (12,000 kg) and pulses (920 kg), and maximum per animal yields of cow milk (1,800 kg); a maximum ratio between net cereal production and imports (70 to 1); maximum values of the two pertinent synthetic indicators and of the summary synthetic indicator, an average of the two.

Type 2

Characteristics include a minimum ratio between net cereal production and imports (3 to 1); and a minimum ratio between food and animal exports and food and animal imports (1.9 to 1).

Type 3

Characteristics include minimum apparent annual per capita cereal consumption (160 kg); minimum daily per capita protein supply (54 gr); minimum ratios of calories of animal origin to calories of vegetable origin (0.16 to 1) and of proteins of animal origin to proteins of vegetable origin (0.60 to 1); minimum per hectare yields of roots and tubers (6,900 kg) and pulses (665 kg), and minimum per animal yields of cow milk (906 kg); a maximum ratio between food and animal exports and food and animal imports (4.3 to 1); and minimum values for the two pertinent synthetic indicators and consequently for the summary synthetic indicator, which is an average of the two.

The External Sector

Only one indicator in this field leads to a rejection of the hypothesis of intergroup differences; nevertheless, it does reveal high differences in intergroup means at the descriptive level, with rank order varying according to the general description of the types. This indicator is the value of total agricultural imports as a proportion of total export value, around twelve per cent.

Particularly striking evidence of this situation can be found in an analysis of those indicators that reveal high and statistically significant differences in means among groups. Such an analysis is useful for describing each of the types of countries, as will be seen below.

Type 1

Characteristics include minimum debt servicing commitments as a share of total gross national product at the beginning of this decade (1.7 percent); maximum numbers of months in which import expenses could be covered with gross foreign exchange reserves toward the close of the last decade (10.3 months); a maximum ratio between agricultural exports and agricultural imports in 1981 (7.4 to 1); on the basis of annual loan averages over the last two decades, agricultural loans from the Inter-American Development Bank that are equal to a minimum share of the agricultural gross domestic product at the beginning of this decade (0.2 percent); and maximum values of the two pertinent synthetic indicators and consequently, of the summary synthetic indicator, an average of the two.

Type 2

Characteristics include minimum coverage of annual debt service using annual exports of goods and services, toward the beginning of this decade (5.4 times); a maximum debt service burden as a share of the total gross national product toward the beginning of this decade (6.1 percent); minimum primary sector exports (excluding fuel, minerals and metals) as a proportion of total merchandise exports (34 percent) by the end of the last decade; a minimum ratio between agricultural exports and agricultural imports in 1981 (1.9 to 1); and minimum values for the two pertinent synthetic indicators and consequently, for the summary synthetic indicator which is an average of the two.

Type 3

Characteristics include maximum coverage of annual debt service obligations with income from annual goods and services exports, at the beginning of this decade (14.5 times); a minimum number of months for which imports could be covered with gross international foreign exchange reserves at the end of the last decade (2.9 months); maximum primary sector exports (excluding fuel, minerals and metals) as a proportion of total merchandise exports (71 percent) by the end of the last decade; a maximum ratio between the annual average of agricultural loans from the Inter-American Development Bank over the last two decades and the agricultural gross domestic product, at the beginning of this decade (0.8 percent).

Employment, Income and Agriculture as a Whole

Of the sixteen simple indicators for this field, only one-fourth fail to reflect high and statistically significant differences in the arithmetic means among groups. These four indicators, related to land use intensity, are: irrigated land as a proportion of total land under cultivation (1978), ranging from four to thirteen percent; irrigated land as a proportion of total land (1980), from one-half to two per cent; numbers of tractors in use per one thousand hectares (around 1978), averaging five (with a maximum of eight, in Type 1 countries, and a minimum of three, in Type 3 countries); and fertilizer use per hectare (around 1978), around forty kilograms per hectare (in the opposite order from that of tractor use, with the minimum of 12 kg/ha in Type 1 and the maximum of 64 kg/ha in Type 3).

The general situation for the countries of Latin America and the Caribbean in this field is described below in more detail, with descriptions of the unique, distinctive (maximum and minimum) traits of each of the three identified types of countries. These traits are revealed in those indicators that show high and statistically significant differences in means among groups.

Type 1

Characteristics include a minimum population density (12 inhabitants per square km); minimum levels of agricultural workers as a proportion of the total labor force (16 percent) at the beginning of this decade; similarly, minimum rural population as a proportion of the total population, also at the beginning of this decade (22 percent); a maximum amount of land under cultivation per capita (total population) at the end of the last decade (4/5 ha); another reflection of this type of "land abundance" in these countries is that land under cultivation was a minimum proportion of total economically useful land (cultivated land plus permanent meadows and pastures, forests and woodlands) at the end of the last decade (10 percent); similarly, minimum head of cattle per hectare of permanent meadows and pastures at the beginning of this decade (0.5); a maximum ratio between land in permanent meadows and pastures and total arable land at the end of the last decade (over 9 to 1); a maximum ratio between land in permanent meadows and pastures and land designated for permanent crops (81 to 1), over eleven times greater than for Type 3 countries; and maximum values for the two pertinent syntnetic indicators and consequently, for the summary synthetic indicator which is an average of the two.

Type 2

Characteristics include a minimum ratio between land used for permanent crops and total arable land (0.17 to 1) by the end of the last decade; minimum energy of agricultural and forest origin as a proportion of total energy consumed, by the end of the past decade (20 percent); minimum agricultural gross domestic product as a proportion of total gross domestic product, at the beginning of this decade (12 percent); similarly, minimum aggregate value of manufactures of food and agriculture as a proportion of total aggregate value of manufactures, by the end of the last decade (28 percent).

Type 3

Characteristics include a maximum population density (95 inhabitants per square km); maximum agricultural labor force as a proportion of total labor force (nearly 50 percent) at the beginning of this decade; similarly, maximum rural population as a proportion of total population, also at the beginning of this decade (nearly 60 percent); minimum land under cultivation per capita (total population) at the end of the last decade (less than one-third of a hectare); as a reflection of this "land hunger," these countries register a maximum amount of land under cultivation as a proportion of total economically useful land (land under cultivation plus permanent meadows and pastures, forests and woodlands) at the end of the last decade (26 percent); similarly, maximum head of cattle per hectare of permanent meadows and pastures at the beginning of this decade (1.5), for an average animal load approximately triple that of Type 1 countries; a maximum ratio between land assigned to permanent crops, and total arable land (0.39 to 1) by the end of the last decade; a minimum ratio between land in permanent meadows and

pastures and total arable land, at the end of the past decade (2 to 1); a minimum ratio between land in permanent meadows and pastures and total land assigned to permanent crops (7 to 1); a maximum amount of energy of agricultural and forest origin as a proportion of total energy consumed, by the end of the last decade (57 percent); a maximum agricultural gross domestic product as a proportion of total gross domestic product at the beginning of this decade (22 percent); parallel with this, maximum value added of manufactures in food and agriculture as a proportion of total value added in manufactures at the end of the last decade (nearly 50 percent); and minimum values for the two pertinent synthetic indicators and consequently, for the summary synthetic indicator which is an average of the two.

Summary

In general terms, all three types of countries are meeting their minimum daily calorie requirements. However, it should be clearly recognized that food imports are substantial in general terms, totalling around ten percent of total imports. There is no doubt that this is partially due to the less than optimum performance of physical crop yields per unit of land, another characteristic found to be universal.

To an even greater extent, the three types of countries reflect highly differentiated conditions and behavior patterns in food and food security. Type 2, with its intermediate countries, is distinguished by weak conditions in terms of the ratios among domestic food production, food exports and food imports. Naturally, the most extreme differences are between Types 1 and 3. Type 1 countries have high performance and conditions, standing in sharp contrast to Type 3 countries, which are in critical shape. A hypothesis put forward here associates this with very low levels of purchasing power among large population groups, since this group shows a maximum ratio between food exports and food imports on the production side. Note that the average estimated "surplus ratio" parameter, or the proportion of surplus remaining after meeting basic needs, is estimated at .382 for these countries, lower than averages for Type 2 (.413) and Type 3 (0.630). This parameter is an indicator...

> ...of relative poverty, that clearly highlights the weight of subsistence expenditures as a portion of overall consumption expenditures...The margin necessary for supplementing consumption is extremely narrow for the group of countries with the lowest subsistence level 16/.

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16 VEGA-CENTENO, Máximo, Pobreza, Niveles y Patrones de Consumo: Un Análisis a Través de los Países Latinoamericanos, Fourth Latin American Congress of the Econometric Society, Santiago, Chile, July 1983, p. 21. Calculations made by the author by type of country, on the basis of evidence presented in Table 2, p. 22.

If Vega-Centeno's conclusions are juxtaposed with those contained herein, another clearly consistent conclusion emerges. It becomes evident that in general (the Vega-Centeno study does not distinguish among diffferent types of countries),

> ...the structure of demand in Latin American countries is dominated by a factor of inflexibility in food consumption, as generally occurs in underdeveloped countries. This phenomenon is typical of situations in which low income produces low consumption levels which are necessarily different from theoretically desirable levels and from what the population may aspire to, for meeting needs and in response to a demonstration effect.
>
> In any case, the uniformly greater inflexibility is a product of nutritional needs...17/.

In this quotation, the author is discussing his low estimated absolute values by country for price elasticity of food demand. Note that the typification tested in this paper takes up this argument and dramatically confirms it: the average absolute value of this parameter for Type 3 countries is certainly lower (-.398) than for Types 2 (-.532) and 1 (-.643) 18/. This, combined with information from outside sources, clearly verifies the accuracy of this typification and, even more important, validates a hypothesis that in the poorer countries, or in any case, the countries with poorer conditions and performance, food prices play a stronger role in the exploitation of poverty.

The most recent available information 19/ on the two indicators described in the first paragraph of this subsection shows that while food imports accounted for about the same proportion of total imports in 1980 as they had in 1979 (around 10 percent), the gap between types of countries in ability to meet average daily calorie requirements grew wider from 1977 to 1980. The level of needs coverage in Type 1 countries fell from 116 percent in 1977 to 123 percent in 1980; in Type 2 countries it slipped from 104.5 percent to 108 percent; and in Type 3 countries, it held steady at 99 percent.

The analysis reveals intermediate and mixed results in Type 3 countries for the indicators of the external sector, despite the poor showing in both

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17 Ibid., p. 27.

18 Calculations by the author by type of country, based on evidence in Vega-Centeno, Máximo, op. cit., Table 5, p. 28.

19 WORLD BANK, World Development Report, 1983, Washington, D.C., July 1983, Section "Indicators of World Development," pp. 161ff.

performance and conditions in the fields of food and food security, and employment, income and agriculture as a whole. For example, these countries cover a maximum of the annual debt service (nearly fifteen times) with foreign exchange income from exports. However, by the end of the last decade, their exchange reserves were minimum, barely enough to cover three months of total imports. The extremes are Type 1 countries (most favorable conditions) and Type 2 countries (least favorable conditions), where the relative burden of the public debt and debt service was already evident by the beginning of the present decade.

The most recent available information 20/ on the external sector shows that the burden of debt service has recently grown heavier, not only because of debt accumulation, but also due to ballooning mean interest rates. All types of countries show a tremendous surge from 1970 to 1981. This climb, however, is proportionally greater for Type 2 countries, where the rate more than doubled from 6.7 percent to 13.7 percent. As was seen, these are the countries in which conditions in this field are most unfavorable. Gross reserves of foreign exchange also declined in relative terms for all countries. The amount of imports that could be covered with the supply of exchange reserves fell from ten months to seven months from 1980 to 1981 in Type 1 countries, from 5.1 to 3.8 months for Type 2, and from 2.9 months to 1.7 months for Type 3. In 1981, there was an inverse ratio between relative rank order of present state or situation by groups of countries and the proportion of total exports that is sent to industrialized market economies. Type 1 countries, which are in the most favorable position, have a ratio of less than fifty percent. Type 2 is intermediate and has a ratio of less than sixty percent. Type 3 is in the most unfavorable position and has a ratio of over sixty percent. The remaining indicators show no recent changes that merit special comment.

The field of employment, income and agriculture as a whole also shows extreme heterogeneity among the countries of Latin America and the Caribbean, which is why the typification system proves so necessary and fitting. With the typification, the situation can be examined by comparing country types. The least significant differences are found for indicators of land use intensity, but they all confirm the general characterization of the three types. The most striking differences are naturally between the extremes, Types 1 and 3. Type 1 shows an evident "land abundance" associated with the low relative weight of agriculture in overall economic activity and a high level of urbanization. Type 3 countries are confronted with a severe "land hunger," together with the high relative economic weight of agricultural and rural activity and, more particularly, of permanent crops.

Although there are different ways to measure "modern" agriculture and "traditional" agriculture in the region, all are open to criticism. One is

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20 Ibid.

based on the characteristics of the agricultural labor force. Modern agriculture could include wage earners, employers, self-employed workers, and unpaid family workers, both professional and technical. Traditional agriculture would normally be associated with the "campesino economy," including self-employed workers and unpaid family members, non professional and non technical. Using this measurement, modern agriculture maintains a ratio of about 1.5 to 1 with traditional agriculture in Type 1 countries and 0.5 to 1 in Types 2 and 3. This means that modern agriculture is about three times more prevalent in Type 1 countries than in the other two types. These approximate figures are based on data not systematically included in the study, and only recently published 21/.

The most recently available information 22/ suggests that no major changes have been taking place in the indicators discussed above for employment, income and agriculture as a whole. The same source provides up to date information on levels of relative development, measured in per capita gross national product in 1981. Type 1 countries average US$2,337, Type 2 register US$1,943 (or US$1,658 if Venezuela is not included) and Type 3, US$928.

The peculiar configuration of characteristics of country types identified and analyzed in this paper suggests that various types of exchanges among countries should be substantially increased in all spheres, including "horizontal" technical assistance. In particular, a more in depth analysis should be done of the apparently extensive opportunities available for direct commercial trade in general, and more specifically, of agricultural products and inputs. Remember that some of the types of countries identified enjoy good conditions and performance for food and general agriculture, but show poor conditions and performance in the external sector. Other countries are in the reverse situation. These are encouraging signs for attaining the long standing, much sought-after objective of integrating and balancing the economies of Latin America and the Caribbean by making use of mutual opportunities and advantages.

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21 PREALC, op. cit., Part I, pp. 33-81. Summary calculations based on different tables of countries.

22 WORLD BANK, op. cit.

CHANGE OR DYNAMICS BY TYPES OF COUNTRIES

General Description of the Types

As was stated in the brief section on methodology, the first step in the process of typifying the countries was to group them in an array of categories from better to worse conditions or performance in terms of change or dynamics over approximately the past decade. This classification was done separately for each of the three targeted topical fields: food and food security, the external sector, and employment, income and agriculture as a whole. The final typification combined these three sets of results, based on the discovery that, unlike the case of indicators of present state or situation, a behavior pattern had taken shape with high frequencies of countries placing in similar categories of performance or conditions in all three topical fields.

The process of synthesis was dominated by three major relative behavior patterns. In the first place are countries with high or good conditions in all three topical fields. In the second place are countries with intermediate conditions and performance in all three fields. Finally come the countries with low or poor conditions in all three fields. This consistency of conditions of change or dynamics made it easy to interpret the three basic matrix types, with a general rank ordering from better to worse relative conditions. Finally, the process of typification used these three basic matrix types to shape the three final country types in terms of general change or dynamics. Ranging from better or high to worse or low conditions, they were called Type 1, Type 2 and Type 3.

Table 4 combines and summarizes the attributes of each of the three types or groups of countries, in terms of all the simple and synthetic indicators of dynamics that were used and derived in the typification. The second division of the table gives the individual values of the simple arithmetic means for all countries. The third division compares these values by deriving the ratios among them. Footnotes are attached to these ratios to indicate the relative magnitude of intergroup differences and their statistical significance as found in the pertinent tests.

Table 4 also gives a complete list of all the simple indicators that were included, broken down by topical field. This table supports the general characterization of the three types of countries that were detected and validated, as described above in the second paragraph of this subsection. A more summarized idea can be obtained from the relative results of the two synthetic indicators and the summary synthetic indicator of the three targeted topical fields, found at the bottom of the list for each section.

Table 4. FINAL TYPIFICATION OF COUNTRIES BY DYNAMICS

LEVELS OF GROUP MEANS OF SIMPLE AND SYNTHETIC INDICATORS

OF DYNAMICS AND COMPARISONS BY RATIOS

ORDER NUMBER	INDICATORS DESCRIPTION	MEANS GROUP 1	GROUP 2	GROUP 3	RATIOS OF MEANS X_1/X_3	X_1/X_2	X_2/X_3
	FOOD AND FOOD SECURITY.						
DPR15APE	INDEX FOOD PROD PER CAPITA	110.833	103.800	98.000	1.259***	1.067	1.179***
DCD16ICA	GROWTH CALORIE SUPPLY PER CAPITA PER DAY	1.118	1.055	.987	1.133***	1.060*	1.068*
DCD17IPC	GROWTH PROTEIN SUPPLY PER CAPITA PER DAY	1.094	1.030	.943	1.160***	1.063*	1.092**
DTC18ACE	% AVG ANNL GROWTH RATE CEREAL AREA	2.900	.161	-.676	-4.292*	17.857*	.238
DTC19REC	% AVG ANNL GROWTH RATE CEREAL YIELD	2.917	2.120	.025	111.111**	1.376	83.333*
DTP20CER	% AVG ANNL GROWTH RATE CEREAL PROD	5.917	3.140	.525	11.236**	1.883	5.980
DPR21LIT	INDEX FOOD PRODUCTION	151.000	135.200	112.000	1.348***	1.117*	1.208**
DPR22LIP	INDEX FOOD PROD PER CAPITA	111.000	106.200	81.000	1.370***	1.045	1.311***
DVC23EAG	GROWTH OF % CEREAL CONSUMP TO FEED LIV	1.693	1.372	13.540	.125*	1.235	.101*
DCR24ARV	GROWTH CEREF PRODUCTION	1.511	1.296	1.091	1.385**	1.167	1.188
DCR25RBH	GROWTH CORN YIELD	1.250	1.254	.971	1.287**	.997	1.292***
DCR26ERT	GROWTH ROOTS AND TUBERS YIELD	1.119	1.063	.781	1.433**	1.053	1.361**
DCR27LBS	GROWTH PULSES YIELD	1.206	1.035	.961	1.339**	1.242**	1.078
DCR28EPS	GROWTH DRY BEANS YIELD	1.517	1.023	1.046	1.449**	1.484***	.978
DCR29ELE	GROWTH CON MILK YIELD	1.068	1.072	.949	1.125	.997	1.129
DIC30RCE	GROWTH RATIO CEREAL IMP TO CEREAL EXP	3.670	3.100	17.055	.215**	1.183	.182**
DTX31MAL	GROWTH RATIO FOOD AND ANIM EXP TO IMP	.974	.717	.833	1.170	1.359	.861
DSP32IAT	RATIO FOOD IMP AS % TOT MERCH IMP	.760	1.251	1.883	.701	.607	1.156
DIS89ALI	SYN IND DYNAMICS FOOD AND FOOD SEC 1	5.174	.128	-8.078	-.641**	40.000***	-.016***
DIS90ALI	SYN IND DYNAMICS FOOD AND FOOD SEC 2	5.574	-.498	-6.938	-.803***	-11.236**	.072**
DISSREALI	SYNTH SUBM IND DYNAMICS FOOD AND FOOD SEC	.517	-.018	-.723			
	THE EXTERNAL SECTOR.						
DRE39BSE	CHANGE IN RATIO GOODS SERV EXP TO DEBT SERV	.936	.789	.700	1.337	1.186	1.126
DRS40DPE	GROWTH OF PUBLIC EXT DEBT BALANCE	7.362	7.472	9.148	.805	.985	.817
DRI41MPI	GROWTH OF RATIO TOTAL IMPORTS TO GDP	1.125	1.207	1.537	.732	.931	.786
DRI42AIM	GROWTH OF RATIO TOT AG EXP TO TOT AG IMP	.679	1.019	.807	.842	.667	1.263
DRI43XIN	GROWTH OF RATIO GOODS AND SERV EXP TO IMP	.888	1.090	.723	1.229	.815	1.508*
DRS44PTO	GROWTH PRIM SCTR MERCH EXP AS % TOT MERCH EXP	.727	.603	.798	.912	1.064	.857
DRX45PCE	GROWTH CEREAL EXPORTS	1.021	2.325	.655	1.558	.439	3.546
DRM46PCE	GROWTH CEREAL IMPORTS	1.720	2.776	2.381	.722	.619	1.166
DIS91BAL	SYN IND DYNAMICS BAL PAYMTS AND EXT SECT 1	-.231	-.204	-1.616	.143	1.136	.126
DIS92BAL	SYN IND DYNAMICS BAL PAYMTS AND EXT SECT 2	.245	.705	-2.121	-.116	.348	-.332
DISSRBAL	SYN SUBM IND DYNAMICS BAL PAYMTS AND EXT SECT	.001	.116	-.298			
	EMPLOYMENT, INCOME AND AGRICULTURE AS A WHOLE.						
DRC61FAT	AGRIC LABOR FORCE AS % TOT LABOR FORCE	1.541	1.576	1.271	1.212	.978	1.241
DRC62FRT	RURAL POP AS % TOTAL POP	1.343	1.355	1.315	1.021	.991	1.030
DRR63CPO	RECIP % ANNL AVG POPULATION GROWTH RATE	.442	.564	.400	1.104	.783	1.410
DRC64TCP	CHANGE % ANNL AVG POPULATION GROWTH RATE	1.066	1.325	.909	1.172	.804	1.458
DVI65APE	GROWTH AGRIC INCOME PER AGRIC POPULATION	1.435	1.290	.975	1.471***	1.112	1.323**
DVI66PBC	GROWTH PER CAPITA INCOME	1.357	1.274	1.092	1.244	1.065	1.167
DPR67GRT	TOTAL AGRICULTURAL PRODUCTION INDEX	150.333	131.800	116.250	1.294***	1.140**	1.134*
DPR68GPE	TOTAL AGRIC PROD INDEX PER CAPITA	110.500	103.800	84.500	1.307***	1.065	1.229***
DTC69PRA	ANNL AVG GROWTH RATE AGRIC GROSS DOM PROD	4.300	2.320	1.700	2.532***	1.852**	1.364
DDI70CAT	DIF AGRIC GDP AND TOTAL GDP GROWTH RATES	-1.667	-.2090	-.850	1.961	.797	2.457
DTC71PIA	% GROWTH RATE OF AGRIC GDP	2.317	2.290	6.375	.363	1.011	.359
DTC72AYO	DIF AGRIC GDP AND TOT GDP % GROWTH	.850	1.750	2.950	.288	.486	.593
DCS73AIR	GROWTH IRRIGATED AGRICULTURAL AREA	1.285	1.799	1.361	.944	.714	1.323
DCR74ENA	GROWTH CATTLE STOCKS	1.367	1.280	1.241	1.101	1.067	1.031
DCR75NHA	GROWTH CHICKEN STOCKS	1.855	1.756	1.650	1.124	1.056	1.064
DCS76UTA	GROWTH ARABLE LAND SURFACE	1.194	1.070	1.122	1.065	1.116**	.953
DCS77UTP	GROWTH AREA IN PERM CROPS	1.069	1.077	1.176	.909*	.993	.916*
DCS78UPA	GROWTH AREA IN PERM MEADOWS AND PAST	1.028	1.029	.952	1.079*	.999	1.080
DRP81AGT	RATIO AGRIC GDP AS % TOTAL GDP	.801	.668	.747	1.072	1.198	.894
DIS93AGR	SYN IND DYNAMICS EMPLY IMCM AND AGRIC 1	3.221	.028	-4.901	-.658***	111.111*	-.006**
DIS94AGR	SYN IND DYNAMICS EMPLY IMCM AND AGRIC 2	2.548	1.052	-6.565	-.388***	2.421	-.160***
DISSREAGR	SYN SUBM IND DYNAMICS EMPLY IMCM AND AGRIC	.388	.056	-.745			
DISSRGEN	GENERAL SUMMARY. DYN	.225	.051	-.585			

* Significant Difference at a Level of .10
** Significant Difference at a Level of .05
*** Significant Difference at a Level of .01

(___) Underlined ratios indicate differences in means among groups that are greater than or equal to one-fourth or 25% (1.25 _ ratio _ .8)

Underlined ratios with asterisks indicate high, statistically significant differences among group means.

Table 5. GROUPINGS BY INDICATORS OF DYNAMICS

REAL LEVELS OF INDICATORS OF DYNAMICS FOR COUNTRY TYPES IN EACH GROUP

INDICATORS

ORDER NUMBER	DESCRIPTION	COUNTRY-TYPE 1 REAL	COUNTRY-TYPE 2 REAL	COUNTRY-TYPE 3 REAL
	FOOD AND FOOD SECURITY.			
DPR15APE	INDEX FOOD PROD PER CAPITA	122.00	102.00	82.00
DCD161CA	GROWTH CALORIE SUPPLY PER CAPITA PER DAY	1.20	.94	1.06
DCD17IPC	GROWTH PROTEIN SUPPLY PER CAPITA PER DAY	1.10	.94	.96
DTC18RCE	% AVG ANNL GROWTH RATE CEREAL AREA	2.10	-.60	5.60
DTC19REC	% AVG ANNL GROWTH RATE CEREAL YIELD	3.90	3.00	-2.80
DTP20/CER	% AVG ANNL GROWTH RATE CEREAL PROD	6.10	2.40	2.60
DPA21LIT	INDEX FOOD PRODUCTION	158.00	132.00	116.00
DPA22LIP	INDEX FOOD PROD PER CAPITA	125.00	101.00	80.00
DVC23EAG	GROWTH OF % CEREAL CONSUMP TO FEED LIVESTOCK	1.53	2.13	1.86
DRC24ARV	GROWTH BEEF PRODUCTION	1.36	1.17	1.59
DCR25RRM	GROWTH CORN YIELD	1.10	1.12	.84
DCR26ERT	GROWTH ROOTS AND TUBERS YIELD	1.32	.94	.60
DCR27LES	GROWTH PULSES YIELD	1.05	1.23	.89
DCR28EFs	GROWTH DRY BEANS YIELD	1.55	1.20	.89
DCR29RLE	GROWTH COW MILK YIELD	1.10	1.00	1.12
DIC3/RCE	GROWTH RATIO CEREAL IMP TO CEREAL EXP	1.05	.16	17.60
DTE31MAL	GROWTH RATIO FOOD AND AGRL EXP TO IMP	.92	.76	1.40
DRP82IAT	RATIO FOOD IMP AS % TOT AGRCH IMP	1.25	.67	.69
	THE EXTERNAL SECTOR.			
DRE39BSE	CHANGE IN RATIO GOODS SERV EXP TO DEBT SERV	1.21	.42	.28
DRS40DPE	GROWTH OF PUBLIC EXT DEBT BALANCE	3.62	9.40	11.17
DRI41MPI	GROWTH OF RATIO TOTAL IMPORTS TO GDP	1.10	.95	1.01
DEX42ADM	GROWTH OF RATIO TOT AG EXP TO TOT AG IMP	.79	.90	.76
DRE43XIM	GROWTH OF RATIO GOODS AND SERV EXP TO IMP	.91	1.40	.94
DRE44PTO	GROWTH PRIM SCTR AGRCH EXP AS % TOT AGRCH EXP	.94	.93	.91
DEX45PCE	GROWTH CEREAL EXPORTS	1.82	8.00	.13
DIM46PCE	GROWTH CEREAL IMPORTS	1.92	1.34	2.35
	EMPLOYMENT, INCOME AND AGRICULTURE AS A WHOLE.			
DRC61FAT	AGRIC LABOR FORCE AS % TOT LABOR FORCE	1.96	1.89	1.11
DRC62PRT	RURAL POP AS % TOTAL POP	1.73	1.28	1.20
DRF63CPO	RECIP % ANNL AVG POPULATION GROWTH RATE	.50	.48	.33
DRC64TCP	CHANGE % ANNL AVG POPULATION GROWTH RATE	1.30	1.26	.91
DVI65APE	GROWTH AGRIC INCOME PER AGRIC POPULATION	1.82	1.12	.95
DVI66PEC	GROWTH PER CAPITA INCOME	1.43	1.27	1.08
DPA67GRT	TOTAL AGRICULTURAL PRODUCTION INDEX	156.00	132.00	131.00
DPA68GPE	TOTAL AGRIC PROD INDEX PER CAPITA	123.00	101.00	91.00
DTC69PRA	ANNL AVG GROWTH RATE AGRIC GROSS DOM PROD	4.90	1.90	1.50
DD170CAT	DIF AGRIC GDP AND TOTAL GDP GROWTH RATES	-1.00	-2.10	-2.10
DTC71PIA	% GROWTH RATE OF AGRIC GDP	3.20	-1.20	1.00
DTC72ATO	DIF AGRIC GDP AND TOT GDP % GROWTH	.70	-4.80	.70
DCS73AIR	GROWTH IRRIGATED AGRICULTURAL AREA	1.24	1.40	1.19
DCR74EVA	GROWTH CATTLE STOCKS	1.20	1.34	1.48
DCR75EGA	GROWTH CHICKEN STOCKS	1.84	1.61	1.69
DCS76UTA	GROWTH ARABLE LAND SURFACE	1.12	1.05	1.13
DCS77UTP	GROWTH AREA IN PERM CROPS	1.08	1.03	1.25
DCS78UPA	GROWTH AREA IN PERM MEADOWS AND PAST	1.00	1.02	1.00
DRP81AGT	RATIO AGRIC GDP AS % TOTAL GDP	.82	*	.84
	SYNTHETIC INDICATORS			
DIS89ALI	SYN IND DYNAMICS FOOD AND FOOD SEC 1	7.46	-2.95	-6.93
DIS90 ALI	SYN IND DYNAMICS FOOD AND FOOD SEC 2	7.19	-4.33	-2.99
DIS91BAL	SYN IND DYNAMICS BAL PAYMTS AND EXT SECT 1	1.46	.17	-1.52
DIS92BAL	SYN IND DYNAMICS BAL PAYMTS AND EXT SECT 2	1.36	1.89	-.95
DIS93AGR	SYN IND DYNAMICS EMPLY INCM AND AGRIC 1	5.96	-.60	-3.44
DIS94AGR	SYN IND DYNAMICS EMPLY INCM AND AGRIC 2	8.84	.79	-6.26

* Missing value

As was stated, Table 4 essentially gives information on the group means. Therefore, it categorizes the countries in a relatively abstract fashion (averages). Table 5 supplements the information in Table 4 by giving the real equivalents of each type or group in the form of real observations of concrete countries representative of each type of dynamics. In synthesis, it can be said that while Table 4 contains systematic information on each of the three "types of countries," Table 5 tells about each of the "country types." The information in Table 5 reconfirms the overall characterization of the three types, as summarized in the second paragraph of this subsection.

The following subsections are based on the information contained in these two tables, particularly the systematic data in Table 4. They give a more in-depth analysis of the findings for each of the three targeted topical fields covered by the study.

Food and Food Security

Only about one-fourth of the eighteen simple indicators of change or dynamics in this field failed to reveal high and significant differences in means among groups. As will be seen below, this was not the case for indicators of dynamics for the external sector or for employment, income and agriculture as a whole, which had extremely high proportions of small or nonsignificant differences in means (90 percent and 80 percent).

There were five indicators in this category in the field of food and food security. In general, a modest increase was experienced over the last decade in daily per capita calorie supply in Type 1 countries (12 percent) and Type 2 countries (6 percent), with a slight fall in Type 3 countries. During the same period, the increase in daily per capita protein supply was even smaller (9 percent for Type 1 and 3 percent for Type 2) or the drop was more marked (-6 percent for Type 3). For both calories and proteins, all the intergroup differences in means were statistically significant, but no case topped the one-fourth (25 percent) level set as the definition of a "high" difference. During the decade, the per animal yield of cow milk rose only slightly (7 percent) or even fell (-5 percent in Type 3 countries). During the second half of the decade, the ratio between food and animal exports and food and animal imports slipped in all countries (ranging from -3 percent to -28 percent). Finally, over the past two decades, food imports as a percentage of total merchandise imports declined in Type 1 countries by around 25 percent and rose around 20 percent in the other two types of countries.

The following breakdown will be based on those items that did show high and statistically significant differences in means among groups. This serves the double analytical purpose of portraying the present situation as a supplement to the foregoing discussion, and at the same time, tracing the unique, distinguishing traits (in terms of maxima and minima) that characterize each of the three types of countries identified.

Type 1

The indicators showed a maximum value for the 1978-1980 annual average index (base 1969-71: 100) of per capita food production (an increase of 11 percent); maximum annual average growth of land surface area (2.9 percent), cereal yields (2.9 percent) and consequently, cereal production (5.9 percent); maximum growth of agricultural and food production during the last decade, both total (51 percent) and per capita (11 percent)*; maximum growth of beef production during the last decade, equal to the growth of total food crop production (51 percent); maximum yield increases during the last decade for corn (25 percent), roots and tubers (12 percent), pulses (29 percent) and dry beans (52 percent); and maximum values for the two pertinent syntnetic indicators, and consequently, for the summary syntnetic indicator which is a summary of tne two.

Type 2

Indicators for the past decade show minimum growth in the percentage of total cereal consumption being used to feed livestock (37 percent); and minimum growth during the last decade of the ratio between cereal imports and cereal exports (the ratio tripled).

Type 3

Indicators show a minimum value for the 1978-1980 annual average index (base 1969-71: 100) of per capita food production (a 12 percent decline); minimum annual average growth of land surface area (-0.7 percent), cereal yield (0 percent) and consequently, cereal production (0.5 percent); minimum growth of food crop production during the last decade, both total (12 percent) and per capita (a 19 percent decline)**; maximum growth during the last decade of the percentage of total cereal consumption used to feed livestock (multiplied fourteen times); minimum growth of beef production during the last decade (9 percent); minimum increases or maximum declines of yields during the last decade for corn (-3 percent), roots and tubers (-22 percent), pulses (-4 percent) and dry beans (5 percent); maximum growth during the last decade of the ratio of cereal imports to exports (multiplied 17 times); and minimum values for the two pertinent synthetic indicators and consequently, for the summary synthetic indicator which is an average of the two.

The External Sector

All but one of the indicators in this field of dynamics reveal high intergroup differences of means. However, only one of these is statistically significant. General conditions are discussed below, in terms of the seven

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* Index for 1981: 111; base, 1969-71 : 100.

** Index for 1981: 81; base, 1969-71 : 100.

simple indicators for which the null hypothesis of no difference among group means cannot be rejected.

During the last decade, there was a general downward slide in the ratio between goods and services exports and the debt service, or the degree to which foreign exchange income generated through exports was sufficient to cover the debt service. This was least pronounced in Type 1 countries and most pronounced in Type 3, where coverage fell by thirty percent. The indicator of change in total outstanding public foreign debt also registered a generalized deterioration, increasing eightfold during the period. Type 1 countries are in the best relative condition, and Type 3, the worst. This same rank order of relative conditions among types of countries characterizes the proportion between total imports and total gross domestic product, a ratio which generally grew around twenty-five percent from 1970 to 1981. In general, the ratio between agricultural exports and agricultural imports slipped during the second half of the decade, from 1976 to 1981. During the last two decades, the proportion between exports from the primary sector (excluding fuels, minerals and metals) and total exports fell by around twenty-five percent. Finally, during the last decade, cereal exports nearly tripled for Type 2 countries, but fell by one-third for Type 3 countries. Cereal imports experienced significant growth in both cases.

All these findings clearly demonstrate the difficulty of giving a neat, simple description of each of the three general types of countries in the area of external sector dynamics. The only simple indicator that displays a high and statistically significant difference in means among groups (between Type 2 and Type 3) is the change from 1970 to 1981 in the ratio between exports and imports of general goods and services, a maximum (9 percent increase) for Type 2 countries and a minimum (-28 percent) for Type 3 countries. Although the pertinent statistical test shows no significance at the preestablished levels, this same ordering of types is found for the two pertinent synthetic indicators, and consequently for the summary synthetic indicator, which is an average of the two. These values are maximum for Type 2 countries (although very near to those of Type 1), and minimum for Type 3.

Employment, Income and Agriculture as a Whole

Many of the simple indicators of this topical field for change or dynamics over time fail to show at least one sign and statistically significant difference among group means. These will be discussed below, to give a general summary picture of the situation of the countries of the region in this field.

The percentage of the total labor force engaged in agriculture experienced a generalized decline over the last two decades. This decline was least pronounced for Type 3 countries (-21 percent). It ran parallel to a generalized process of urbanization, marked by a twenty-five percent fall in the

rural population as a percentage of the total. The average annual rate of population growth predicted for 1980-2000 is around 2.4 percent for Type 1 and Type 3 countries, and only 1.8 percent for Type 2. From 1960-70 to 1970-80, the population growth rate was generally in decline in Type 1 and Type 2 countries (a 25 percent drop in Type 2), while in Type 3 countries it rose (10 percent). Overall per capita income climbed around thirty percent in Type 1 and Type 2 countries from 1970 to 1981, but only nine percent in Type 3 countries.

An unfavorable difference was found between growth rates (1970 to 1980) of the total gross domestic product and the agricultural gross domestic product (ranging from around -1 percent to -2 percent). This trend was reversed in 1981, when agriculture registered positive differences of around one to three percent and the agricultural gross domestic product grew by around two to six percent. For the last decade, several indicators of growth for all types of countries unanimously show positive increases from around two percent (growth of land surface in permanent meadows and pastures) to around seventy-five percent (growth in chicken stocks). This includes variables such as irrigated agricultural area, cattle stocks, surface of arable land, and land surface used for permanent crops. Finally, the weight of agriculture in the general economy of Latin America and the Caribbean clearly slipped over the last two decades, as revealed in the indicator of agricultural gross domestic product, which lost around twenty-five percent of its share in the total gross domestic product.

This section will close with a summary of conditions, stressing the unique and distinguishing characteristics (maximum and minimum levels) of Type 1 countries and Type 3 countries. Type 2 is clearly a pure intermediate in this context, revealing no strikingly distinctive features. On the other hand, as we will see, Type 1 is a case of pure maximum growth, while Type 3 shows clear minimum growth, or stagnation and even regression over time.

Type 1 and Type 3

Indicators show maximum growth for Type 1 and minimum growth for Type 3 countries for all the following variables (the rates are shown in parenthesis): agricultural income per agricultural inhabitant from 1970 to 1981 (44 percent, -2 percent); total agricultural production during the same period (50 percent, 16 percent); per capita agricultural production (11 percent, -15 percent); agricultural gross domestic product from 1970 to 1980 (annual average growth rates of 4.3 percent, 1.7 percent); hence, similar maximum and minimum patterns for Type 1 and Type 3 countries are found for the values for the two pertinent synthetic indicators in this topical field, and consequently for the summary synthetic indicator, which is an average of the two.

Summary

This study of the conditions and performance of dynamics or change over time for the countries of Latin America and the Caribbean has focused on about the last ten-year period. As was expected, the results of this study were much less sharply differentiated than the findings for the various structural situations discussed in the last chapter. The particular countries did not so clearly pertain to specific groups, and the differences in conditions and performance from one group to another were much less striking. Naturally, conditions of change are much more volatile than those of present state or situation, which stem from a combination of certain initial conditions and of changes accumulated throughout history and altering the initial conditions to produce the present situation. Obviously, these changes do not come to a standstill during a relatively brief period, such as a decade. However, the major analytical interest lies with those that took place in the most recent period.

The areas of employment, income and agriculture as a whole and the external sector show the most uneven results among the groups of countries described generally and specifically above. This is especially true for the external sector. By contrast, the area of food and food security shows more constant general and specific results and highly differentiated situations, behaviors and performances.

In the study of the external sector, the most dramatic case of differences among groups of countries was the considerable deterioration over time of the ratio between exports and imports in Type 3 countries (nearly 30 percent). This is the only general topical field which failed to produce statistically significant differences between the levels of the estimated synthetic indicators, even though the qualitative descriptions of indicators clearly point to a serious and undesirable trend affecting Type 3 countries. All the simple indicators in the study reveal poor conditions for change or dynamics, and some are even regressive. This reflects a period of generalized deterioration for the the external sector, a situation which has become even more clear and dramatic in the last two years and this year to date. The trend includes specific indicators for the agricultural sector, with a generalized increase in cereal imports. In general, at the descriptive level, the changes in situation and performance are relatively more positive in the Type 1 countries, and extremely negative in Type 3 countries.

The most recent available information 23/ on the external sector is revealing. We find that if the change in the ratio between exports and the debt service is measured from 1970 to 1981, instead of from 1970 to 1980, the relative deterioration for Type 3 countries is even stronger, falling by fifty-five percent instead of thirty percent. These newer data also suggest that we

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23 Ibid.

look more deeply into the effects that changing prices of foreign trade have on changes and dynamics in the countries of the region. The indicator of trade price ratios (export prices divided by import prices, base 1975= 100) for 1981 shows a positive change for countries that enjoy relatively favorable dynamics (Type 1, 20 percent increase). The change is unfavorable for countries with relatively intermediate dynamics (Type 2, 20 percent reduction) and for countries with strongly unfavorable dynamics (Type 3, 25 percent reduction).

In the area of employment, income and agriculture as a whole, Type 2 countries are clearly in the middle, with no unique traits. All the sharp, significantly distinguishing features are found in Type 1 countries and Type 3 countries. These indicators clearly show maximum growth for Type 1 and minimum growth for Type 3 countries, which experience stagnation or even negative changes over time. In general, trends in the region indicate that the relative weight of agriculture in the economy of the countries has declined, along with a relative drop in the percentage of the total labor force that is engaged in agriculture, and an agricultural growth rate lower than that of the general economy. The most recent available information 24/ on six of the simple indicators used in this topical field does not contradict these inferences. If anything, they indicate continued deterioration in the most disadvantaged group of countries, Type 3.

Another recent source of information 25/ shows that the total aggregate value of the agricultural sector during the last decade grew an average of 54 percent for Type 1, 43 percent for Type 2, and 5 percent for Type 3, if 1980 levels are compared with 1970 levels. The annual averages of the 1980-1982 period show 56 percent for Type 1, 48 percent for Type 2, and 11 percent for Type 3. Absolute levels of these annual average values for 1980-1982 for the different groups (aggregates) of countries were around US$12.50 billion, US$40.50 billion and US$4.25 billion, using 1980 dollars. The average for the countries in each group was US$2.10 billion, US$4.05 billion and US$1.06 billion, again in 1980 dollars. This aggregate value of the agricultural sector shows a falling growth rate in all groups if the outcome of the two halves of the last decade are compared. For the groups of countries already shown to have greater and lesser levels of dynamism (Type 1 to Type 3, in that order), these growth rates fell from annual averages of 5.25 percent to 3.55 percent for Type 1, from 2.87 percent to 2.50 percent for Type 2, and from 1.3 percent to 1.1 percent for Type 3. This downward trend over the decade in the different types of countries was also reflected in the sliding annual average growth rate of the per capita gross domestic product, which fell from 3.22

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24 Ibid.

25 INTER-AMERICAN DEVELOPMENT BANK, Economic and Social Progress in Latin America. 1983 Report, Washington, D.C., 1983, Part Three, Statistical Appendix, pp. 353-416.

percent (3.1 percent for the whole decade) to 2.98 percent in Type 1 countries, from 3.00 percent (2.6 percent for the whole decade) to 2.16 percent in Type 2, and from 1.65 percent (1.1 percent for the whole decade) to 0.5 percent in Type 3. This variable was already showing negative growth rates for Type 1 and Type 2 countries by 1981. In 1982, all three types experienced highly negative rates: -4.95 percent for Type 1, -5.05 percent for Type 2, and -2.78 percent for Type 3. Finally, in this field of employment, income and agriculture as a whole, evidence shows 26/ that the declining conditions of change or dynamics as we move from Type 1 to Type 2 to Type 3 countries, as identified in the study, appear to be translated into differential levels of real agricultural wages (corrected for inflation) earned by the population. The indices (base, 1970: 100) for 1980 were 118 for Type 1, 112 for Type 2, and 92 for Type 3 (a fall in absolute terms).

In the field of dynamics of food and food security, even the indicators that fail to reveal high and statistically significant or even high differences among groups follow the same trends that confirm the identification of Type 1 countries as more dynamic and Type 3 countries as less dynamic, stagnated, or even regressing with time. In general terms, judging by changes in the selected indicators during the last decade, evidence can be found of significant growth of some variables, especially crop yields per unit of land. These are restricted primarily to Type 1 countries, in which major increases were also found in general food and agricultural production or specific production of certain items. Other variables showed signs of stagnation, especially in certain types of countries. Finally, several indicators produced signs of frank deterioration or regression, consistently concentrated in Type 3 countries, with per capita food production and physical yields actually declining. In fact, these countries show maximum growth only for qualitatively undesirable variables, such as the ratio between cereal imports and cereal exports and the percentage of total cereal consumption that is used to feed livestock. These two indicators are the only distinctive features of Type 2 (intermediate) countries, which have a behavior pattern contrary to that of Type 3 (minimum).

An apparent anomaly in the changes taking place in the region is the substantial rise in the percentage cited above of total cereal consumption used to feed livestock. This is found in all three types of countries, but is clearly higher in Type 3, the poorest group with the poorest conditions or performance. This is graphic evidence that animals are competing with the human population, and with increasing success, for the use of this scarce resource. It can be hypothesized that for this particular phenomenon, as for food and food security in general, the scene appears to be dominated more by the demand side than by the production side. This cannot be viewed in isolation from the level of the purchasing power of large population groups.

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26 PREALC, op. cit. Data processed by the author, on the basis of data found in Table III.3 of Part Three, pp. 149-151.

Finally, the most recently available information 27/ in this field provides a persistent, even accentuated picture of dynamic deterioration of food imports as a proportion of total imports. Food imports continue to swell, especially in Type 3 countries, the least dynamic. At the same time, these countries are suffering serious declines in the level of the per capita food production index (base, 1969-71 annual average; 100), with the level falling from a 1978-1980 annual average of 88 (a 12 percent reduction) to 85 (a 15 percent reduction) for the last annual average, 1979-1981.

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27 WORLD BANK, op. cit.

GENERAL SUMMARY AND CONCLUSIONS

One of the first paragraphs of Chapter I of the recently released 1983 World Bank Report 28/ reads as follows:

> Today's problems plaguing the developing countries are the culmination of events which date back a decade or more. They are partly the result of the conditions prevailing in the industrial countries with market economies and partly attributable to their own policies".

This study focuses on "today's problems" and examines the situation in Latin America and the Caribbean as a whole (Section III), in IICA's geographic areas (Section IV), and for structural types of countries (Section V) in the region. The general aggregate analysis highlignts the most recent events (1981, 1982 and part of the first semester of 1983). The disaggregate analysis, broken down according to specific groups of countries, examines conditions prevailing at the beginning of this decade or at the end of the last, and is also concerned with the "events of the decade," that is, the general development and processes of change in Latin America and the Caribbean (Chapter III), in IICA's geographic areas (Chapter IV) and in the countries typified according to their dynamics (Chapter VI) which make up the region and are members of the Inter-American Institute for Cooperation on Agriculture. Furthermore, the general analysis highlights the most recent changes which have taken place in 1981, 1982 and part of the first semester of 1983. The disaggregate analysis which is broken down according to specific groups of countries refers to changes which have been taking place over the course of the last decade in general.

As indicated, an effort has been made to steer the analysis toward relevant country groups of the heterogeneous ensemble of the Latin American and Caribbean countries. The analysis was developed on the basis of two alternative perspectives: the first, a natural geograpnic partitioning, determined by IICA's geographic areas; and the second, the country types defined by certain characteristics of the present state or situation and change or dynamics over time. The reasons why it was both necessary and practical to approach the subject matter in this way are enumerated in the summary section on methodology and, in greater detail, in Appendix C. The conclusions contained herein coincide with those of other documents published recently in the Inter- American System:

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28 World Bank, op. cit., Chapter I, "General Overview," p. 1.

Latin America and the Caribbean are difficult regions to analyze in that they are composed of countries and subregions which vary radically 29/.

When discussing Latin America there is always the danger of making excessively broad generalizations either by taking into account only the experiences of some of the larger economies or by classifying the countries of the region into overly simplistic categories, such as oil-exporters and non oil-exporters, even though a superficial glance at statistics on the region does not justify the use of such simplistic classifications. Therefore, for the purposes of this chapter, groups of countries with similar development patterns will be identified through the use of histograms or frequency diagrams30/*.

The work on this project has attempted to establish an organizational, methodological and informational basis for conducting increasingly complete and refined studies. The coverage of certain subjects, the guaranteed availability of one hundred simple and synthetic indicators, and established alternative schemes for a disaggregate analysis will pave the way for more serious studies which are concerned with relevant, timely topics and hypotheses. This solid base could equally serve as the focal point for the discussions, conclusions and specific recommendations in the high level technical meeting which will address the topic of "Agriculture and the Current Crisis" and should

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29 OAS, Measures, Policies and Mechanisms to Guarantee the Flow of External Resources and the Financing of the Development of Latin America and the Caribbean, Working paper for Item 2B of the Provisional Agenda of the Conference on Financing, Caracas, Venezuela, July 1983, introductory paragraph, p. 1.

30 IDB, Economic and Social Progress in Latin America, 1982 Report, Washington, D.C., 1982, Chapter 4, "Economic Growth, Business Trends and Trade Relations," p. 100.

* It is worth noting the recent diffusion and recognition of the concepts of classification/typification, which IICA has been working on for almost a decade in its area of competence. The use of frequency diagrams in the implementation of these concepts is valid although extremely rudimentary, particularly--as in the case of the Report--when its use is restricted to detailed analysis of isolated variables, instead of "using information from several variables in a coordinated and meaningful way," as postulated in IICA, Seminario sobre Métodos y Problemas en Tipificación de Empresas Agropecuarias, Series of Reports on Conferences, Courses and Meetings, No. 92, Montevideo, Uruguay, December 1975, Volume 2, Chapter IV "Ilustraciones", Section on "Resultados de Histogramas", pp. 43-48.

take place early in 1984. The content of the discussions, presentations, comments and conclusions arrived at during this Round Table of the Second Regular Meeting of the Inter-American Board of Agriculture could also constitute a significant contribution.

The first part of the section devoted to IICA's geographic areas* indicates why it was found advisable, when dealing with homogeneous types of countries, to use typification and analysis that separated factors of present state or situation from those of change or dynamics. This notion is based essentially on simple theoretical and empirical logic which points to the lack of kinship between the two phenomena. On the one hand, as stated earlier**, the present situation is the outcome of a series of initial circumstances combined with a number of changes which have accumulated not only during the last decade, but throughout history. On the other hand, formal and preliminary tests conducted in the field of food and food security 31/ confirmed that this hypothesis of independence could not be rejected. For the final results presented herein, that is, those derived from analyzing food and food security jointly with the external sector and employment, income and agriculture as a whole, formal evidence compiled*** also confirmed that this hypothesis of independence could not be rejected. Here, however, there is some evidence at the descriptive level which suggests a minimal but positive correlation between the performance of present state or situation and that of change or dynamics.

The overall analysis, which included the most noteworthy of recent changes, revealed that all of Latin America and the Caribbean, at this moment in time, is going through a serious recession, is facing severe difficulties in servicing its foreign debt and is experiencing a general deterioration of

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31 State and Dynamics..., op. cit., Cf. Section "Conclusions and Recommendations", especially results of Contingency Tables and their interpretation.

* Section Four, "The State and Dynamics of IICA's Geographic Areas", Cf. pg. 15, second paragrapn.

** Cf. Section Six "Change or Dynamics by Types of Countries," subsection "Summary", first paragraph, p. 47,

*** With the chi-square proof derived from the contingency table, the null hypothesis of lack of association cannot be rejected at any reasonable level of significance. Using rank correlation, and comparing results with the critical tabulated values of rho statistics, the hypothesis is rejected at the 0.05 level of significance, but it cannot be rejected at 0.01. By converting rho and comparing the results with the critical tabulated values for the applicable "t" statistic, the hypothesis is again rejected at 0.05, but not at 0.02.

its external sector. Overall production has fallen substantially in the very recent past; agriculture has recorded zero growth; the growth rate of per capita gross domestic product was negative in 1982 for all the countries in the region. Not only has the foreign debt of these countries reached staggering levels, but, what is worse, this will hinder any development effort in the future. There are already signs of "revolt" in response to attempts to impose "adjustment and stabilization plans" on governments and countries in an inflexible, even bureaucratic fasnion. Tnere are also certain dramatic social phenomena which reflect deteriorating living conditions as a product of tne crisis and the adjustments sought to remedy this situation. Over the course of the past decade, the debt has increased at least eightfold. New loans no longer suffice to pay interest, and interest rates have doubled. The level of financial voracity, fed by certain policies, and the deterioration of the external sector have caused the ratio between debt servicing obligations and exports to quadruple. Whereas this ratio was thirteen per cent in 1970, it rose to thirty-three per cent in 1980 and forty per cent in 1981. By 1982, more than half of all export earnings were earmarked for debt servicing 32/.

The remedy for plummeting basic commodity prices depends largely on the awareness and collective responsibility of tne world community. It is extremely difficult to make people see tnat economic recovery of the developing countries, which could be acnieved through nigher receipts for exports of basic commodities and agricultural products in particular, would stimulate the importation of industrial goods and help to end worldwide recession. This is confirmed by tne growing use which the industrialized countries have been making of protectionist measures during recent years. Meanwhile, it is the industrialized countries that are benefitting from tne depressed basic commodity prices. It is also true that at least one third of the reduction in the rate of inflation in the OECD countries between 1980 and 1982 can be attributed to this price slide. These depressed prices also mean savings in foreign exchange which contribute to the trade balance and the balance of payments 33/. On the other hand, it has been estimated 34/ that a fifty per cent reduction in trade barriers that the OECD countries have imposed on approximately one hundred agricultural products would bring about an eleven per cent increase in the exports of fifty-six relatively less developed countries. This in turn would mean extra revenue of close to three thousand million dollars for 1977. In this connection, note Latin America's

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32 WORLD BANK, op. cit., Table 2.14, p.25.

33 ECLA, "Aspectos de una política latinoamericana en el sector de los productos básicos", Comercio Exterior, Vol. 33, No. 5, Mexico, May 1983. pp. 413-430, especially p. 423.

34 THE WORLD BANK, op. cit., Box 5.7 "Measuring the Impact of Agricultural Protection", p. 54.

dependency: sixty percent of these additional earnings would be channeled toward the countries of this region.

The study reveals that the level of foreign trade has increased significantly if the average for the latter half of the last decade is compared with 1981. Despite this effort, higher general exports, primary commodity exports and agricultural exports are not able to bring about increased net earnings for the region. The region, and more notably its agricultural sector, are facing a triple challenge which calls for maintaining and expanding prevailing nutritional levels, creating employment in the agricultural sector for the rural population and substantially increasing foreign exchange income to lessen the gap in the external sector. But the terms of trade, the price movements of agricultural products in foreign markets and the protectionist measures of the relatively more developed industrialized countries will make it difficult to meet such a challenge with success. Accordingly, it is natural to look for alternatives, such as "increased autarky," which seeks solutions from within the Region itself and even resorts to barter in order to save foreign exchange. Such alternatives are being explored in diverse ways 35/.

The region as a whole has no food deficit, and it has sufficient productive capacity to prevent the accumulation of a food deficit. Existing nutritional shortages are basically due to deficient purchasing power 36/, which is linked to poverty, the most serious problem in the economic development process in general and agricultural and rural development more specifically. Vast differences can be observed in this regard inside national economies, and significant differences also exist among individual countries and among groups and types of countries.

This study has attempted to identify these differences and highlight them. In the context of a hostile and uncertain world, it is these differences that undergird a policy of "expanded food self-sufficiency" based on a consistent strategy whereby the countries resort first and foremost to the region itself. It is a strategy that will allow the countries to take full

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35 Cf. for example, the following three notes related to the question of food and food security and basic commodities. See also those concerning intraregional trade in general, as in

OAS, Medidas, Políticas y Mecanismos... op. cit., esp. Sección III "Crecimiento, Desarrollo y Peso de la Deuda", Crecimiento Económico, Ajustes Internos y Algunas Posibilidades de Cooperación ante la Situación Financiera: incremento del comercio intraregional, p. 11.

36 Along the same lines, Cf. SCOTT, Douglas, "El Hambre en la Década de 1980, Los Modelos Cambiantes de la Desnutrición", Revista CERES, Vol. 14, No. 13, Mayo-Junio 1981.

advantage of the benefits which international trade provides, while averting the disadvantages and risks inherent in a dependency on quantity and price levels which are subject to severe fluctuations and uncertainty. It will also give their national economies access to an appropriate mechanism for dealing with the extremely high and growing deficit of foreign exchange which most of these countries are experiencing. IICA and the OAS have publically advanced this thesis in the past 37/, and ECLA maintained this same position at the Meeting on Latin American Coordination prior to the VI UNCTAD of June 1983 38/.

The three preceding chapters furnished the informational "messages" of exactly one hundred simple and complex indicators, concerning the present state or situation and the change or dynamics of the different types of countries and the different geographic areas which make up the region known as "Latin America and the Caribbean," in terms of food and food security, the external sector, and employment, income and agriculture as a whole. The details can be found therein and more compact data are available in the summaries at the end of each section. This summary will make reference to some outstanding points which emanate from the analysis.

The study reveals that during the second half of the last decade alone, the ratio of exports to imports of food and animals dropped in all the geographic areas and in all of the types of countries examined; in some countries, this ratio fell by almost one-third. Similarly, the cost of agricultural imports averaged the equivalent of one-sixth of the value of total exports, at times reaching as much as one-third. Food imports, in turn, totalled approximately one-tenth of total imports. All this projects a bleak picture for the countries of three of IICA's geographical areas, "traditionally dependent on food aid," which translates into an intermediate position on a world scale of estimated per capita food aid requirements.

The external sector and the agricultural sector are facing serious difficulties, and the situation is growing worse. Half of the total gross domestic product is going into imports, which at the start of the last decade represented only twenty per cent. Meanwhile, cereal imports doubled and even quadrupled during the decade.

Given the present situation and changes which have occurred during the last decade, it is difficult to envision keeping up the present pace of the

37 OAS-IICA, op. cit., Sección "Estrategias y Políticas Regionales y Subregionales", pp. 11-16.

38 ECLA, op. cit., Sección IV "Hacia un nuevo enfoque de la Política y de la Estrategia Latinoamericana en el Campo de los Productos Básicos", pp. 425-430, esp. p. 426 y 429 (C. Posibles Acciones en Escala Regional).

country/city exodus and, in general, the urbanization process which has been taking place in the countries of the region. However, this is a situation which appears likely to remain unchanged in only one of the four geographic areas and one of the three types of countries studied. It is expected that the agricultural sector will need to make a unique contribution to the efforts which the times require, but if this is to happen, agriculture must retain its significant position in the overall economy (to the contrary of what has been happening to date, at different rates, depending on the type of country in question).

The competition between livestock and people for the consumption of cereals is, in effect, competition between human subpopulations from radically different income levels. The percentage of these nutrients destined for feeding animals has skyrocketed over the last decade, and present levels continue to be significant. It should be pointed out, however, that both present levels and the levels of change for this indicator are maximal precisely in the type of countries which was found to have the poorest conditions and/or performance. In a certain sense, this situation is anomalous and pathological, and its causes and effects ought to be studied thoroughly and rectified where required.

Deterioration in the dynamics of food imports is all the more serious when one considers the most recently available data: food imports are rising, particularly in the type of countries that revealed the most discouraging pattern of dynamics. At the same time, the per capita food production index in these countries has suffered: from an average of 88 per cent (12 per cent below the level at the close of the previous decade) during 1978-1980, it fell to an average of 85 per cent (a decrease of 15 per cent) for 1979-1981. Type 3 countries (in terms of present state or situation), which rank relatively high in performance in the external sector, but very low where food and agriculture as a whole are concerned, have the highest ratio of food and animal exports to imports (more than four to one). The foregoing, in conjunction with other evidence which issued from this study and other sources, underscores the importance of viewing the problem of food and food security not only as an isolated phenomenon of general agricultural and rural development, but more specifically in terms of development in general and particularly the purchasing power of the general populace. It goes without saying that this does not underestimate the role of agriculture in efforts at improving the situation.

The purchasing power of the general population has been and continues to be seriously eroded by inflation, which naturally affects the "demand side." But it also has a negative effect on the "supply side." In market economies, productive investment is a function of profitability or relative benefits. These, in turn, are a function of the price differential between products and production inputs. We have already witnessed what is happening to the terms of trade and the prices of agricultural commodities on foreign markets. This must be added to the problems experienced by producers themselves when the purchasing power of foreign currency obtained through exports also declines in the domestic markets where the goods are produced.

This was demonstrated in a recent study of the movement of the dollar's real exchange rate in the countries of the region between 1970 and 1980 39/. The real exchange rate with an index base of 100 (1970) slipped to 87 by the middle of the last decade and had fallen to 76 at the end of that decade and the beginning of the present one. As a result, the United States dollar lost its purchasing power in the internal markets of the region by an estimated annual average of 2.3 per cent during that period. Estimates for the recent past (first quarter of 1980 through fourth quarter of 1982) 40/ reveal a more pronounced average rate of deterioration for the aggregate of IICA's member countries (weighted by their relative proportion of the Institute's total budgetary expenditures), equivalent to a quarterly average rate of -1.66...per cent, equivalent to an annual rate of approximately seven per cent*.

Chapter IV of the present study, in addition to reviewing the state and dynamics of Latin America and the Caribbean, attempts to characterize each of the four geographic areas where IICA is operating. This general summary will highlight only a few of the findings. The areas can be generally and tentatively arrayed in terms of the performance of relative conditions with respect to present state and to changes over time, as follows: 1. Southern, 2. Andean, 3. Central, 4. Caribbean. In the last two there is a marked shortage of land, accompanied by an increasing density of population. The agricultural and rural components of the economies as a whole are still very high and decreasing slowly. With respect to this land scarcity problem in the case of Area 1, Central, we have pointed out the notorious imbalance between the distribution of property and the agricultural populations that work the land. Those involved in the so-called "traditional sector" exceed those in what is referred to as the "modern sector" by a ratio of 1.4 to 1. Campesino agriculture, generally associated with the former sector, reveals a high level of participation (more than half) in the total agricultural supply for domestic markets, and

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39 IDB, Economic and Social Progress in Latin America, 1982 Report, Washington, D.C., 1982, pp. 45-49 and particularly pp. 46 and 48, Tables 13 and 14.

40 IICA, Directorate of Analysis and Evaluation, Evolución Trimestral del Poder Adquisitivo Real del Dólar en los Países Miembros del IICA. 1980-1982, San Jose, Costa Rica, August 1983.

* The effects of these trends are felt not only by exporters in the countries of the region, and indirectly, by producers (farmers in particular), but they also take their toll on those who earn or manage budgets in convertible foreign exchange, which they must convert in order to be able to meet payments in local or national currency. The international and inter-American organizations are included among those who figure in this category. A rate of deterioration in the real domestic purchasing power of the US dollar of approximately seven per cent annually requires average budgetary increases in excess of seven per cent annually to cover real levels of operational expenses.

close to half this much in the supply of products for export. This ought to be kept in mind in designing policies, particularly those concerned with food and food security in the countries with these characteristics.

At the same time, three groups of Latin American and Caribbean countries have been typified, bearing in mind such factors as present state or situation in the fields of food and food security, the external sector, and employment, income and agriculture as a whole. One group, Type 1, exhibits high or satisfactory levels in all three fields; another, Type 2, has satisfactory performance in food and agriculture, but poor performance in the external sector; and lastly, Type 3 has the reverse performance/conditions pattern of Type 2.

There is evidence of a particularly high level of intergroup heterogeneity in the area of food and food security. The condition of the countries categorized as Type 3 can be qualified as dramatic. On the basis of evidence collected, it could be hypothesized that there is relatively more exploitation of poverty, through food prices, in the poorest countries, or at least in the countries with the poorest conditions/performance. Type 2 countries, with difficulties in the external sector, are the very countries now confronting a relatively higher hike in interest rates on debts (an average of 6.7 per cent in 1970, as compared with an average of 13.7 per cent in 1981).

The three types of countries also registered very high levels of heterogeneity in employment, income and agriculture as a whole. Type 1 is a clear case of an "abundance of land," which contrasts sharply with the relative scarcity experienced by Type 3. In Type 3 and Type 2 countries, the general ratio between modern and traditional agriculture is .5 to 1, while in Type 1 it is approximately 1.5 to 1. The characteristics of the three types of countries mentioned are reflected in the levels of the indicator (not used in the typification process) of per capita gross national product for 1981: US$2,500 for Type 1; US$1,500 to US$2,000 for Type 2; and US$1,000 for Type 3, in round figures. The peculiar conformation of characteristics in these groups of countries is such that it would seem appropriate to bring about substantial increases in all kinds of exchange among them, including "horizontal" technical assistance and direct trade, particularly in the field of agriculture and food. Greater integration is therefore encouraged from every standpoint.

Three groups of Latin American and Caribbean countries have also been typified according to change or dynamics in the three topical fields already referred to. All three groups exhibit internally uniform characteristics in every area, and the three differ from one another in terms of high or improved conditions/dynamics (Type 1), an intermediate position (Type 2) and low or poorer conditions/dynamics (Type 3). The most notable differences among them occur in the area of dynamics of food and food security, particularly when comparing Type 1 to Type 3. The picture could be simplified by stating that Type 1 exhibits maximal relative growth and Type 3, minimal relative growth.

A negative effect was tentatively identified in the dynamic growth of the countries as a result of changes in the terms of trade. While terms of trade are generally favorable for Type 1 countries, the other, less dynamic, types are experiencing significant deterioration. Figures on dynamics in all the groups show signs of deteriorarion in the behavior of aggregate value of agriculture, according to recent information which could not be systematically and originally included in the study. The annual average growth rate of this aggregate value dropped between the first and the second halves of the last decade as follows: from 5.3 per cent to 3.6 per cent (Type 1); from 2.9 per cent to 2.5 per cent (Type 2); and from 1.3 per cent to 1.1 per cent (Type 3). While changes over the course of the last decade show some favorable signs, especially in terms of yield largely associated with Type 1 countries, there are also signs of stagnation, even recession, consistently concentrated in the Type 3 countries, which witnessed, in addition to a drop in physical yields, a decrease in per capita food production, as mentioned previously.

Within the context of past and present trends, which we have attempted to systematize and review, it is fitting to emphasize the desirability of change in the functions historically assigned to agriculture, as proposed in the new basic documents of the Inter-American Institute for Cooperation on Agriculture 41/. The most outstanding functions are agroenergy and conservation, the importance of which went unnoticed in past decades. Another is the near reversal of the functional role of agricultural development as a displacer of labor. The agriculture-urban industry dichotomy is being replaced with a spatial-rural concept which envisages the assignment of employment in and throughout rural spaces with the integration of agriculture and industry. This new framework must allow for traditional as well as present functions, such as feeding the growing population of different types of countries in the region. Only on the basis of a thorough understanding empirically founded on pertinent structures which draw together the crucial variables of these new functions and processes, can new policies be defined, executed and evaluated 42/.

As compared with other large blocks of nations (developed countries, Asia and Africa), Latin America and the Caribbean register the lowest ratio of cultivated land to potentially arable land (16.7 per cent versus Asia, for example, with 70.8 per cent). Meanwhile, the region has the highest ratio of

41 IICA, IICA's General Policies, IICA/JIA/Doc.27(82), San Jose, Costa Rica, October 1982.

42 In IICA steps have already been taken in this direction. For example,. in "Notas y Análisis sobre Políticas...", op. cit. especially Section V "Un Modelo Simple para Decisiones de Política Alimentaria-Poblacional", pp. 11-22.

potentially arable land to total surface (36 per cent versus approximately 20 per cent for the rest of the large blocks) 43/.

These characteristics of the resource base and the actual and potential distribution of resource use stand in contrast to the finding that the urban population of the region is expected to grow from 196 million to 464 million and the rural population from 128 million to only 156 million between 1975 and 2000. This process could lead to an increase in the urban/rural ratio from sixty per cent to seventy-five per cent, twice the forecast for Africa and Asia. However, there is a high degree of uncertainty regarding future rural population levels. Estimates fluctuate from 125 million to 193 million, with different predictions for the region varying by over fifty percent 44/. In view of the present situation and recent developments, including the current decade to date, the population level in the rural sector can be expected to lie closer to the higher figure. This may even be desirable if the new functions of agriculture, discussed above, come into being.

Accordingly, there is a pressing need to design innovative and decisive new policy schemes and new forms of implementation, particularly in terms of the functions and roles which agriculture and the rural sector must play if the present crisis is to be survived and the path of agricultural and rural development is to be pursued. This will require addressing the problems of low urban and rural incomes of vast population groups in the different country types in the region, and striking a balance in the price structure to keep the interests and behavior of consumers of agricultural products compatible with those of producers. It will also be necessary to address the need, evidenced by the present crisis, for more flexible structures which are better equipped to meet the problem of economic depression. In this connection, the employment/unemployment question is of vital importance. Experience has shown that recent "adjustment" and "stabilization" processes do not necessarily generate employment. Agriculture can play a revitalizing role, taking advantage of its lower costs (by comparison with industry) to create additional or marginal employment. Agricultural technology naturally has a role to play in the process as well.

In order for agricultural technology to be able to make the necessary contribution, a turnabout must take place in the organizations involved in science and technology, created in the 1960's in the countries of the region, which recently have been stagnating and deteriorating. There must also be a reversal of the gradual process of decapitalization in the region, which has stemmed from neglect of the serious educational efforts that had been undertaken on a large scale during the sixties.

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43 IICA, Perfiles Demográficos y de Desarrollo de Asentamientos Rurales en América Latina y el Caribe, Project Profile, Directorate of Analysis and Evaluation, San Jose, Costa Rica, March 1983, p. 4.

44 ibid, p. 6

Agricultural technology has been molded by a situation of relatively low fuel prices and the implicit belief that such conditions would prevail indefinitely. The result has been a sustained mechanization process and high levels of fertilizer consumption, sometimes in indiscriminate doses. Naturally, this must be reversed, in light of recent events and prevailing trends. We must move quickly and decisively to identify adequate technological development styles which are truly viable. New fields presently in vogue, such as genetic engineering in the more advanced countries, are being watched, but high priority attention should be given to the design and testing of profitable farming methods. In a more general context, but no less important, careful decisions must be made concerning the apparent dichotomy between the development of local scientific and technological capabilities, vs. the indiscriminate adoption of technological advances which are being generated on the world level, particularly in the relatively more developed countries. Findings and decisions being made and adopted in all these fields should naturally provoke changes in prevailing systems of technology transfer.

The concept of "appropriate technology" needs to be expanded so as to guide agricultural technological research. The appropriateness of the technologies must not only include the characteristics proper to the different types of enterprises and operations, but must also view the productive resources available in the different types of Latin American and Caribbean societies. It is probably unreasonable to imagine a single technology which is both appropriate and applicable for the region as a whole. While attempts at local and marginal adaptation have been highly fruitful, they are not enough to meet the challenge posed by highly diversified combinations of production factors. These radical dissimilarities among highly differentiated types of countries are attested to in the empirical evidence compiled in the present study. It is possible to prove that a given technology, which we will call "modern," is appropriate, to a greater or lesser degree, for a country in a "Type 1 situation," but that in the case of a "Type 3 situation," new and different approaches must be found, including combinations of old and new techniques.

Lastly, while today's pressing issues are problems which must be recognized and addressed, they must never cloud our long-term view, the development approach which should predominate. The characteristics and problems of the different types of countries in Latin America and the Caribbean examined herein are eloquent evidence of the need for appropriate measures and decisions. This Round Table of the Second Regular Meeting of the Inter-American Board of Agriculture, echoing the position of the OAS in this respect 45/, will open the doors for discussion of alternatives so that the adjustments which are forthcoming may be designed and implemented so as not to interfere with the attainment of the objectives or basic ends which the Member States laid down in the Convention on the Inter-American Institute for Cooperation on Agriculture and which they all continue to maintain today.

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45 OAS, Medidas, Políticas y Mecanismos..., op. cit., Section I La Percepción de Problemas Financieros de Desarrollo", p. 2.

APPENDICES

APPENDIX A. DETAILED DESCRIPTION AND SOURCES OF INDICATORS

NAME OF INDICATOR	LABEL, DESCRIPTION AND MEANS OR FORMULA FOR CONSTRUCTION	SOURCE
	FOOD AND FOOD SECURITY. Present state.	
EUA01CPE	APPARENT ANNUAL CEREAL CONSUMP PER CAPITA Apparent annual cereal consumption per capita, in kilograms, 1977-79 p. 16, column 13	IADS
EC002CAL	% DAILY CAL REQ PER CAP COV BY SUPPLY Percentage of daily per capita calorie requirements covered by supply, 1977 Table 22, last column	WB
EDP03R0T	PROTEIN SUPPLY PER CAPITA PER DAY Per capita protein supply per day, 1978-80 Table 98, division 1, last column	FAO 1
ECD04CVA	COMB BY ANIMAL/VEG ORIGIN OF CAL SUPPLY Composition of the calorie supply by animal/vegetable origin, 1978-80 Table 97, last division, last column central division, last column	FAO 1
EDP050VA	COMB BY ANIMAL/VEG ORIGIN OF PROT SUPPLY Composition of the protein supply by animal/vegetable origin, 1978-80 Table 98, last division, last column central division, last column	FAO 1
ERE06CER	AVG ANNUAL YIELD CEREALS QUINTALES/HA Average annual yield of cereals in quintals (100 kilograms) per hectare of area in cereals p. 17, column 17	IADS
ERE07MMA	CORN YIELD KG/HA Corn yield, kg/ha, 1981 Table 13, central division, last column	FAO 1

ERP08ATU — ROOTS AND TUBERS YIELD KG/HA — FAO 1
Yield of roots and tubers, kg/ha, 1981
Table 18, central division, last column

ERE09NLS — PULSES YIELD KG/HA — FAO 1
Yield of pulses in kg/ha, 1981
Table 22, central division, last column

ERF10RIS — DRY BEANS YIELD KG/HA — FAO 1
Yield of dry beans, kg/ha, 1981
Table 23, central division, last column

ERL11EPA — COW MILK YIELD KG/ANIMAL — FAO 1
Yield of cow milk in kg/animal, 1981
Table 90, central division, last column

ERI12AFO — RECIP PER CENT FOOD IMP IN TOT MERCH IMP — WB
Reciprocal of the percentage share of food imports in total merchandise imports, 1979

$$\frac{1}{\text{Table 10, column 3}}$$

ERP13CIC — RATIO CEREAL PROD NET CEREAL IMP — IADS
Ratio of cereal production to net cereal imports, 1977-79
p. 16

$$\frac{100}{\text{column 12}} - 1$$

ETX14AMA — RATIO FOOD AND ANIM EXP TO FOOD AND ANIM IMP — FAO 2
Ratio of food and animal exports to food and animal imports, 1980
Tables 150 ff, line three $\frac{\text{division 2, last column}}{\text{division 1, last column}}$

FOOD AND FOOD SECURITY. Dynamics.

DPR15APE — INDEX FOOD PROD PER CAPITA — WB
Per capita food production (1969-71:100), 1978-80
Table 1, last column

DCD16ICA — GROWTH CALORIE SUPPLY PER CAPITA PER DAY — FAO 1
Growth of per capita daily calorie supply, 1978-80/1966-68
Table 97, first division $\frac{\text{last column}}{\text{first column}}$

DCD17IPC — GROWTH PROTEIN SUPPLY PER CAPITA PER DAY — FAO 1
Growth of per capita daily protein supply 1978-80/1966-68
Table 98, first division $\frac{\text{last column}}{\text{first column}}$

DTC18ACE	% AVG ANNL GROWTH RATE CEREAL AREA Annual average percent growth rate of area in cereals, 1969-71 to 1977-79 p. 17, column 19.	IADS
DTC19REC	% AVG ANNL GROWTH RATE CEREAL YIELD Average annual percent growth date of cereal yields, 1969-71 to 1977-79	IADS
DTP20CER	% AVG ANNL GROWTH RATE CEREAL PROD Average annual percent growth rate of cereal production, 1969-71 to 1977-79 p. 17, column 18	IADS
DPA21LIT	INDEX FOOD PRODUCTION Food production in agriculture, index number 1981 (1969-71:100) Table 4, last column	FAO 1
DPA22LIP	INDEX FOOD PROD PER CAPITA Food production in agriculture per capita, index number 1981 (1969-71:100) Table 6, last column	FAO 1
DVC23EAG	GROWTH OF % CEREAL CONSUMP TO FEED LIVESTOCK Growth of the percentage of cereal consumption used to feed livestock, 1979-81/1969-71 $\frac{\text{\% cereal for feeding livestock 1979-81}}{\text{\% cereal for feeding livestock 1969-71}}$	USDA
DRC24ARV	GROWTH BEEF PRODUCTION Growth of beef production, 1981/1969-71 (thousands of metric tons) Table 83, $\frac{\text{Beef production 1981}}{\text{Beef production 1969-71}}$	FAO 1
DCR25EN4	GROWTH CORN YIELD Growth of corn yield, 1979-81/1969-71 Table 13, central division, $\frac{\text{column 2 + column 3 + column 4}}{\text{3 x column 1}}$	FAO 1
DCR26ERT	GROWTH ROOTS AND TUBERS YIELD Growth of yield of roots and tubers, 1979-81/1969-71 Table 18, central division, $\frac{\text{column 2 + column 3 + column 4}}{\text{3 x column 1}}$	FAO 1

DCR27LES — GROWTH PULSES YIELD — FAO 1

Growth of yield of pulses, 1979-81/1969-71
Table 22, central division,

$$\frac{\text{column 2 + column 3 + column 4}}{\text{3 x column 1}}$$

DCR28EFS — GROWTH DRY BEANS YIELD — FAO 1

Growth of yield of dry beans, 1979-81/1969-71
Table 23, central division,

$$\frac{\text{column 2 + column 3 + column 4}}{\text{3 x column 1}}$$

DCR29ELE — GROWTH COW MILK YIELD — FAO 1

Growth in per animal yield of cow milk 1981/1969-71
Table 90, central division,

$$\frac{\text{last column}}{\text{first column}}$$

DIC30ECE — GROWTH RATIO CEREAL IMP TO CEREAL EXP — FAO 3

Growth in the ratio of cereal imports to cereal exports, 1979-81/1969-71

$$\frac{\dfrac{\text{Cereal imports 1979-81}}{\text{Cereal exports 1979-81}}}{\dfrac{\text{Cereal imports 1969-71}}{\text{Cereal exports 1969-71}}}$$

DTX31MAL — GROWTH RATIO FOOD AND ANIM EXP TO IMP — FAO 2

Growth rate of food and animal exports to food and animal imports, 1980/76
Table 150 ff., line three

$$\frac{\dfrac{\text{division 2, last column 1980}}{\text{division 1, last column 1980}}}{\dfrac{\text{division 2, last column 1976}}{\text{division 1, last column 1976}}}$$

THE EXTERNAL SECTOR. Present state.

ECE32SER — RATIO GOODS AND SERV EXP TO DEBT SERV — WB

Ratio of goods and services exports to debt service, 1980

$$\frac{\text{---}}{\dfrac{100}{\text{Table 13, last column}}}$$

ESD33GNP — DEBT SERV AS % OF GROSS NAT PROD — WB

Debt service as a percentage of the gross national product, 1980
Table 13

EMC34IRE — MONTHS IMP COV WITH GROSS INT EXCH RES — WB

Months of import coverage with gross reserves of international foreign exchange, 1980
Table 15, last column

ECE35TIA — RATIO OF TOT EXP AND AGRIC IMP — IADS
Ratio of total exports to agricultural imports (including non edible manufactures and livestock feed), 1977-79
p. 16 $\frac{100}{\text{column 11}}$

EXP36RIT — PRIM SCTR MANUF EXP AS % TOT MANUF EXP — WB
Manufacture exports originating in the primary sector (other than fuels, minerals and metals) as a percent of total manufacture exports, 1979
Table 9, column 5

ETX37IMP — RATIO TOT AGRIC EXP TO TOT AGRIC IMP — FAO 2
Ratio of total agricultural exports to total agricultural imports, 1981
Table 6 $\frac{\text{division 2, last column}}{\text{division 1, last column}}$

EPA38BID — RATIO ANNL AVG IDB AGRIC LOANS TO AGRIC GDP — IDB 1, IDB 2
Ratio of the annual average of IDB loans granted to the agricultural sector from 1961 to 1982 to the agricultural gross domestic product, 1981
IDB 2, Table 3; IDB 1, Table 9, p. 385
$\frac{100 \times \text{annual average IDB loans to agricultural sector}}{\text{Agricultural sector added value 1981}}$

THE EXTERNAL SECTOR. Dynamics.

DRE39BSE — CHANGE IN RATIO GOODS SERV EXP TO DEBT SERV — WB
Percent change from 1980 to 1970 of ratio between goods and services exports and debt service, 1980/1970
Table 13 $\frac{\text{penultimate column}}{\text{last column}}$

DRS40DPE — GROWTH OF PUBLIC EXT DEBT BALANCE — IDB 1
Growth of the balance of the public external debt, 1980/1970
Table 55, p. 418
$\frac{\text{Balance of public external debt 1980}}{\text{Balance of public external debt 1970}}$

DRI41MPI — GROWTH OF RATIO TOTAL IMPORTS TO GDP — IDB 1
Growth of the ratio of total imports to gross domestic product, 1981/1970
Tables 3 and 7, p. 382 and 384
$\frac{\frac{\text{Goods and services imports 1981}}{\text{Gross domestic product 1981}}}{\frac{\text{Goods and services imports 1970}}{\text{Gross domestic product 1970}}}$

DEX42AIM GROWTH OF RATIO TOT AG EXP TO TOT AG IMP — FAO 2

Growth of the ratio of total agricultural exports to total agricultural imports, 1981/1976

Table 6 $\frac{\text{division 2, last column 1981}}{\text{division 1, last column 1981}} \Big/ \frac{\text{division 2, last column 1976}}{\text{division 1, last column 1976}}$

DRE43XIM GROWTH OF RATIO GOODS AND SERV EXP TO IMP — IDB 1

Growth of the ratio of goods and services exports to goods and services imports, 1981/1970

Table 6 and 7, p. 384

$$\frac{\frac{\text{Goods and services exports 1981}}{\text{Goods and services imports 1981}}}{\frac{\text{Goods and services exports 1970}}{\text{Goods and services imports 1970}}}$$

DRE44PTO GROWTH PRIM SCTR MERCH EXP AS % TOT MERCH EXP — WB

Growth rate of merchandise exports from the primary sector (other than fuels, minerals and metals) as a percent of total merchandise exports, 1979/1960

Table 9 $\frac{\text{column 5}}{\text{column 4}}$

DEX45PCE GROWTH CEREAL EXPORTS — FAO 3

Growth of cereal exports, 1979-81/1969-71

$$\frac{\text{Cereal exports 1979-81}}{\text{Cereal exports 1969-71}}$$

DIM46PCE GROWTH CEREAL IMPORTS — FAO 3

Growth of cereal imports, 1979-81/1969-71

$$\frac{\text{Cereal imports 1979-81}}{\text{Cereal imports 1969-71}}$$

EMPLOYMENT, INCOME AND AGRICULTURE AS A WHOLE. Present state.

EDE47POB POPULATION DENSITY H/KM^2 — FAO 1

Population density, 1980, inhabitants per km^2

$$\frac{\text{Total population}}{\text{Land surface area}}$$

EPF48ATO RECIP AGRIC LAB FORCE AS % TOT LAB FORCE — WB

Reciprocal of the percent of the agricultural labor force in the total labor force, 1980

Table 19 $\frac{100}{\text{column 5}}$

EPR49UTO — RECIP RURAL POP AS % OF TOT POP — WB

Reciprocal of the percent of the rural population in the total population, 1980

Table 20 $\frac{100}{100 - \text{column 3}}$

ETC50PEC — HECTARES CROPPED LAND PER CAPITA — IADS

Hectares of land under cultivation per capita (total population), 1978

p. 17, column 23

EPT51CUT — % ECONOMIC LAND IN CROPS — IADS

Land under cultivation as a percentage of total "economic" land (cultivated land plus permanent meadows and pastures, forests and woodlands), 1978

p. 17, column 21

EPT52ITO — % CROPPED LAND IRRIGATED — IADS

Land in irrigation as a percentage of total land under cultivation, 1978

p. 17, column 22

EPT53IEI — PROPORTION TOTAL IRRIGATED AREA — FAO 1

Proportion of total irrigated area, 1980

$$\frac{\text{Table 2, column 5}}{\text{Table 1, column 5, line 2}} \times 100$$

EIN54TRA — AVG TRACTOR DENSITY PER THOU HA — IADS

Average density of tractor use per thousand hectares, 1978

p. 17, column 25

EIN55FER — FERTILIZER CONSUMPTION PER CROPPED HA — IADS

Consumption of fertilizer (nitrogen, phos phorus, potassium) per hectare of cropped land, kilograms, 1978

p. 17, column 24

ERG56AHA — CATTLE PER HA OF PERM MEADOWS & PAST — FAO 1

Head of cattle per hectare of permanent meadows and pastures, 1980

$$\frac{\text{Head cattle 1980}}{\text{Land in permanent meadows and pastures 1980}}$$

ECU57TAC — RATIO LAND PERM CROP/ARABLE LAND — IICA

Combination of land use, ratio of land used for permanent crops/arable land, 1979

Column 3 $\frac{100}{\text{(line 2) / (line 3)}}$

ECU58TAP — RATIO LAND PERM MEADOWS & PAST/ARABLE LAND — IICA
Combination of land use, ratio of land in permanent meadows and pastures/arable land, 1979
Column 3 $\frac{100}{\text{(line 2) / (line 4)}}$

ECU59CUP — RATIO PERM MEADOWS & PAST/TOT AREA PERM CROP — IICA
Combination of land use, ratio of land in permanent meadows and pastures/land used for permanent crops, 1979
Column 3 $\frac{100}{\text{(line 3) / (line 4)}}$

EPE60AFT — AGROFOREST ENERGY AS % TOTAL ENERGY CONS — MONTOYA
Agroforest derived energy as percent of total energy consumption, 1978-1980
Last column

EMPLOYMENT, INCOME AND AGRICULTURE AS A WHOLE. Dynamics.

DRC61FAT — AGRIC LABOR FORCE AS % TOT LABOR FORCE — WB
Labor force engaged in agriculture as a percent of total labor force, 1960/1980
Table 19 $\frac{\text{column 4}}{\text{column 5}}$

DRC62PRT — RURAL POP AS % TOTAL POP — WB
Population in rural areas as a percent of total population, 1960/1980
Table 20 $\frac{\text{100 - column 2}}{\text{100 - column 3}}$

DRT63CPO — RECIP % ANNL AVG POPULATION GROWTH RATE — WB
Reciprocal of the annual average percent population growth rate, 1980-2000
Table 17 $\frac{1}{\text{column 4}}$

DRC64TCP — CHANGE % ANNL AVG POPULATION GROWTH RATE — WB
Ratio of the annual average percent population growth rate, (1960-70)/(1970-80)
Table 17 $\frac{\text{column 2}}{\text{column 3}}$

DVI65APE — GROWTH AGRIC INCOME PER AGRIC POPULATION — FAO 1, IDB 1
Growth of agricultural income per agricultural population, 1981/1970
IDB 1, Table, 9 p. 385; FAO 1, Table 3 p. 64-66

$$\frac{\frac{\text{Agricultural added value 1981}}{\text{Agricultural population 1981}}}{\frac{\text{Agricultural added value 1970}}{\text{Agricultural population 1970}}}$$

DVI66PEC — GROWTH PER CAPITA INCOME — IDB 1
Growth of per capita income, 1981/1970
Table 3, p. 382

$$\frac{\text{Per capita income 1981}}{\text{Per capita income 1970}}$$

DPA67GRT — TOTAL AGRICULTURAL PRODUCTION INDEX — FAO 1
Total agricultural production, index number 1981 (1969-70:100)
Table 5, last column

DPA68GPE — TOTAL AGRIC PROD INDEX PER CAPITA — FAO 1
Total agricultural production per capita, index number, 1981 (1969-71:100)
Table 7, last column

DTC69PRA — ANNL AVG GROWTH RATE AGRIC GROSS DOM PROD — WB
Annual average growth rate of the gross domestic product of agriculture, 1970-80
Table 2, column 5

DDI70CAT — DIF AGRIC GDP AND TOTAL GDP GROWTH RATES — WB
Difference between annual average growth rate of gross domestic product of agriculture, 1970-80, and annual average growth rate of total gross domestic product, 1970-80
Table 2, (column 5) - (column 3)

DTC71PIA — % GROWTH RATE OF AGRIC GDP — IDB 1
Percent growth rate of the gross domestic product of agriculture in 1981
pp. 201-364, last column, line 2

DTC72ATO — DIF AGRIC GDP AND TOT GDP % GROWTH — IDB 1
Difference between percent growth rate of gross domestic product of agriculture in 1981, and growth rate of total gross domestic product in 1981
pp. 201-364, last column, (line 2) - (line 1)

DCS73AIR GROWTH IRRIGATED AGRICULTURAL AREA — FAO 1
Growth of the total irrigated agricultural area, 1980/1969-71
Table 2 column 5 / column 2

DGR74EVA GROWTH CATTLE STOCKS — FAO 1
Growth in cattle stocks, 1981/1969-71
Table 80, division 1 last column / first column

DCR75EGA GROWTH CHICKEN STOCKS — FAO 1
Growth in chicken stocks, 1981/1969-71
Table 82, division 1 last column / first column

DCS76UFA GROWTH ARABLE LAND SURFACE — IICA
Growth of arable land surface, 1979/1969-71
Line 2 column 3 / column 2

DCS77UFP GROWTH AREA IN PERM CROPS — IICA
Growth of land surface area used for permanent crops, 1979/1969-71
Line 3 column 3 / column 2

DCS78UPA GROWTH AREA IN PERM MEADOWS AND PAST — IICA
Growth land surface area in permanent meadows and pastures, 1979/1969-71
Line 4 column 3 / column 2

MISSING VALUES. Present State.

EPA79GTO AGRIC GDP AS % OF TOTAL GDP — WB
Agricultural gross domestic product as a percent of total gross domestic product, 1980
Table 3, column 5

EMA80GTO FOOD AND AGRIC MANUF AS % TOT MANUF — WB
Aggregate value of manufactures in food and agriculture (percent, 1975 prices) as a percent of total aggregate value of manufactures, 1979
Table 6, column 2

MISSING VALUES. Dynamics.

DRP81AGT	RATIO AGRIC GDP AS % TOTAL GDP Ratio of agricultural gross domestic product as a percent of total gross domestic product, 1980/1960 Table 3 column 5 / column 4	WB
DRP82IAT	RATIO FOOD IMP AS % TOT MERCH IMP Ratio of food imports as a percent of total merchandise imports, 1979/1960 Table 10 column 3 / column 2	WB

SOURCES

IDB 1	Economic and Social Progress in Latin America. 1981 Report, Washington, D.C., 1982.
IDB 2	IDB PAHO-30 and Frank Meissner.
FAO 1	FAO Production Yearbook. 1981.
FAO 2	Fao Trade Yearbook. 1981.
FAO 3	Fao trade Yearbooks. 1974, 1981.
IADS	International Agricultural Development Service, Agricultural Development Indicators, WEashington, D.C., 1981.
IICA	Uso de Tierras, based on data from the FAO Production Yearbook, 1980.
MONTOYA, Michel	"Anexo 5," prepared with data from OLADE, Balances Energéticos de América Latina, Quito, Ecuador, 1981, 381 pp.
USDA	U.S. Department of Agriculture. FAS, Grain Statistics (computer print-out), January 1983.
WB	World Bank, World Development Report. 1982, Washington, D.C., 1982.

APPENDIX B. MATRIX OF BASIC DATA

FOOD AND FOOD SECURITY - Indicators of present state.

OBS	NUPAIS	GRUPUJNJ	EUACICPE	ECU02CAL	EUP03ROT	ECU04CVA	EDP05OVA	EREC6CER	ERE07NMA	ERR08ATU	ERE09NLS	ERF10RIS	ERL11EPA	ERI12ATO	ERP13CIC	ETX14AMA
1	01ARG	3	379	124	111.9	0.472	1.576	23	3857	16598	1016	1052	1856	0.143	99.000	7.878
2	02BUL	1	164	67	52.7	0.195	0.459	10	1316	6705	980	1053	1304	0.100	2.125	1.227
3	03BRA	3	212	111	55.3	0.191	0.614	13	1836	11793	461	465	739	0.083	6.692	3.808
4	04COL	2	142	98	60.0	0.250	1.000	23	1399	11593	655	757	981	0.100	5.250	8.476
5	05COS	2	182	113	60.3	0.220	1.003	22	1876	8070	519	519	1045	0.143	5.250	5.859
6	06CHI	3	256	110	74.0	0.185	0.553	20	4128	11156	932	1174	1550	0.071	1.857	0.377
7	07ECU	1	105	90	48.7	0.228	1.004	15	1094	9765	562	569	1214	0.125	2.125	5.721
8	08ELS	2	164	94	57.6	0.148	0.459	16	1882	12658	753	753	961	0.077	5.250	5.125
9	09GUA	2	171	92	55.9	0.103	0.324	13	1547	3887	649	682	905	0.143	5.667	6.114
10	10HAI	1	151	92	44.5	0.087	0.236	12	720	3743	470	543	200	0.038	3.348	1.299
11	11HON	1	200	93	51.5	0.122	0.370	10	994	3708	598	578	607	0.111	4.556	4.922
12	12JAM	2	179	118	63.4	0.187	0.643	13	1795	11436	789	667	1000	0.059	0.042	0.542
13	13MEX	3	309	113	72.2	0.167	0.494	18	1812	13028	752	683	782	0.125	6.143	0.522
14	14NIC	1	162	116	64.7	0.233	0.777	11	1000	4087	779	779	850	0.071	4.882	2.450
15	15PAN	1	173	104	55.9	0.208	0.888	15	971	7670	511	455	1001	0.100	4.263	1.783
16	16PAK	2	211	119	61.3	0.248	0.684	14	1500	14066	817	800	1919	0.077	10.111	0.576
17	17PER	1	153	98	56.3	0.157	0.524	15	1986	8433	935	1074	1075	0.063	1.439	0.457
18	18REP	1	127	102	46.6	0.158	0.643	30	2083	9160	990	764	1469	0.059	1.439	3.216
19	19URU	2	253	105	66.6	0.573	1.769	13	1338	5429	924	578	1629	0.100	99.000	3.718
20	20VEN	2	255	102	70.6	0.268	1.054	20	1451	8772	663	684	1152	0.083	1.083	0.052

FOOD AND FOOD SECURITY - Indicators of Dynamics

OBS	DPR15APE	DCD16ICA	DCD17IPC	DTC18ACE	DTC19REC	DTP20CER	DPA21LIT	DPA22LIP	DVC23EAG	DRC24ARV	DCR25ENM	DCR26ERT	DCK27LES	DCR28EFS	DCR29ELE	DIC30ECE	DTX31MAL
1	122	1.041	1.067	-1.2	3.7	2.5	136	117	1.102	1.199	1.414	1.252	1.112	1.144	0.976	0.045	0.649
2	106	1.089	1.054	1.7	-0.5	1.1	137	104	1.625	1.686	1.016	0.878	1.528	2.251	1.032	1.632	2.131
3	117	1.012	0.932	2.6	-0.1	2.5	172	131	1.103	1.235	1.235	0.643	0.733	0.732	0.965	65.666	0.783
4	122	1.200	1.100	2.1	3.9	6.1	158	125	1.526	1.362	1.102	1.316	1.646	1.552	1.101	1.054	0.921
5	112	1.137	1.079	4.8	4.4	9.6	142	109	1.636	1.778	1.432	1.270	1.237	1.237	1.109	0.067	0.946
6	93	0.956	1.010	-1.0	1.0	0.1	120	99	1.037	1.042	1.218	1.055	0.946	0.925	1.131	1.931	0.759
7	95	1.087	0.970	-5.6	5.7	-0.2	139	100	1.750	1.656	1.373	0.851	1.040	1.167	0.912	0.371	0.950
8	119	1.176	1.141	2.6	0.6	3.2	136	99	0.962	1.474	1.115	1.456	0.944	0.944	1.224	4.362	1.185
9	112	1.047	1.028	-0.5	1.8	1.3	164	117	1.900	1.667	1.380	0.577	1.066	1.082	1.010	11.806	1.062
10	92	1.015	0.998	-0.6	1.2	0.5	110	85	50.000	1.316	0.699	0.876	0.989	1.243	1.026	3.539	1.144
11	82	1.056	0.964	5.6	-2.8	2.6	116	80	1.657	1.594	0.841	0.602	0.888	0.888	1.124	17.596	1.404
12	96	1.124	1.041	13.5	0.0	13.7	106	89	80.476	1.182	1.276	1.134	1.156	0.656	1.000	1.381	0.495
13	103	1.044	1.052	0.5	2.1	2.6	155	111	1.105	1.336	1.387	1.218	1.266	1.188	1.394	398.531	0.585
14	95	0.905	0.888	-2.3	0.4	-1.7	110	76	1.158	0.610	1.226	0.964	0.891	0.891	0.820	47.021	0.366
15	102	0.944	0.944	-0.6	3.0	2.4	132	101	2.125	1.171	1.120	0.944	1.234	1.193	1.002	0.157	0.755
16	111	1.052	1.103	7.0	2.0	9.1	158	111	1.057	0.935	1.235	1.015	1.226	1.199	1.005	1.578	0.374
17	83	0.973	0.923	-0.6	1.3	0.7	112	83	1.143	0.864	1.115	0.663	1.074	1.163	0.826	0.093	0.417
18	94	1.112	1.126	1.8	2.8	4.7	137	102	1.649	1.438	1.155	0.857	0.623	0.986	1.067	4.943	0.472
19	97	1.011	1.019	-2.4	2.4	-0.1	119	113	0.689	1.183	1.262	0.543	1.075	1.051	1.044	107.194	0.537
20	102	1.144	1.202	2.3	5.5	8.3	147	100	2.412	1.639	1.332	1.258	1.605	1.782	1.151	5.883	0.411

EXTERNAL SECTOR. Indic. pres.st / **EXTERNAL SECTOR. Indicat. of Dyn.**

OBS	ECE32SER	ESD33GNP	EMC34IRE	ECE35TIA	EXP36RIT	ETX37IMP	EPA38BID	DRE39BSE	DRS40DPE	DRI41MPI	DEX42AIM	DKE43XIM	CRE44PTJ	DE>45PCE	DIM46PCE
1	6.024	1.4	6.7	25.00	74	12.794	0.178	1.295	4.989	1.493	0.858	0.960	0.779	1.507	0.668
2	3.861	4.7	5.4	8.33	11	0.404	0.757	0.425	5.343	0.609	0.361	1.254	0.929	1.000	1.632
3	2.941	3.4	1.9	8.33	50	4.459	0.219	0.368	10.953	1.127	0.807	0.986	0.562	0.044	2.885
4	10.417	1.7	13.7	10.00	74	4.898	0.153	1.208	3.623	1.100	0.788	0.935	0.937	1.824	1.923
5	6.098	4.3	1.3	9.09	75	5.694	0.757	0.604	10.638	0.871	0.957	1.392	0.765	22.000	1.477
6	4.367	5.2	6.2	5.88	21	0.606	0.645	0.825	2.005	1.244	1.853	1.423	5.250	1.100	2.125
7	7.143	3.8	4.3	14.29	51	2.673	0.905	0.650	10.501	1.552	0.515	0.876	0.515	8.000	2.967
8	28.571	1.2	3.6	9.09	74	3.341	0.892	1.029	7.429	1.073	0.527	0.971	0.767	0.429	1.670
9	28.571	0.8	4.3	12.50	75	5.248	0.171	2.114	4.909	0.847	0.487	1.094	0.769	0.167	1.968
10	23.810	1.1	0.7	1.92	50	0.378	0.395	1.381	8.133	1.972	0.452	0.713	0.500	1.000	3.509
11	10.101	3.9	1.5	5.88	85	4.230	0.601	0.283	11.174	1.007	0.759	0.939	0.914	0.133	2.346
12	7.813	7.9	0.7	4.17	17	0.414	0.759	0.195	8.839	0.984	0.625	0.958	0.378	1.000	1.381
13	3.135	4.9	1.5	5.88	22	4.304	0.554	0.755	10.283	1.530	1.846	0.752	0.344	0.040	15.761
14	6.897	3.7	5.0	11.11	87	3.703	1.326	0.766	9.559	2.103	1.625	0.701	0.916	0.036	1.809
15	5.435	14.3	0.6	3.33	64	1.381	1.022	0.418	9.403	0.951	0.897	1.402	0.929	8.000	1.339
16	8.850	1.8	9.6	2.94	88	2.528	0.393	1.044	7.595	1.684	1.201	0.521	0.880	0.643	1.015
17	3.195	8.1	6.9	8.33	43	0.434	0.680	0.371	7.725	1.067	0.392	0.537	0.860	20.000	1.859
18	4.651	2.3	2.2	5.26	71	3.257	1.262	0.209	6.034	1.118	1.114	0.906	0.772	1.000	4.943
19	8.475	1.9	14.5	10.00	51	6.516	0.661	2.144	4.281	1.000	1.144	1.662	0.718	2.127	228.000
20	7.576	4.9	8.9	8.33	1	0.026	0.137	0.220	12.061	1.636	0.281	0.157	0.038	0.391	2.362

EMPLOY. INCOME & AGRIC. AS A WHOLE. Indic. of pres.st. do

OBS	EUE47PCB	EPF48ATC	EPR49UTU	ETC50PEC	EPT51CUT	EPT52ITO	EPT53IEI	EIN54TRA	EIN55FER	ERG56AHA	ECU57TAC	ECL58TAP	ECL59CLP	EPE60AFT
1	5.875	7.69231	5.55556	1.3	15	4	0.577	5.7	3	0.389	39.8089	571.43	1428.6	5.66
2	5.137	2.00000	1.49254	0.7	4	4	0.129	0.2	1	0.148	2.6769	833.33	33333.3	13.64
3	14.465	3.33333	3.12500	0.4	6	3	0.213	7.4	79	0.572	15.9286	297.62	1666.6	30.01
4	24.833	3.84615	3.33333	0.2	6	5	0.298	4.8	49	0.758	39.3082	746.27	1886.8	23.93
5	43.683	3.44828	1.75439	0.2	11	5	0.514	12.0	163	1.400	73.1529	549.45	751.9	40.70
6	14.829	5.26316	5.00000	0.5	15	23	1.676	3.6	22	0.308	3.6940	222.22	5882.4	18.57
7	28.973	1.92308	1.81818	0.3	13	20	1.878	2.1	27	1.139	49.4315	146.20	295.9	26.67
8	231.515	2.00000	1.69492	0.2	44	7	5.309	4.6	164	2.361	33.9674	115.07	335.0	67.02
9	66.974	1.81818	1.63934	0.3	21	4	0.627	2.2	55	1.900	23.9751	60.28	251.3	61.83
10	210.776	1.35135	1.38889	0.2	55	8	2.540	0.5	4	2.165	62.3830	53.55	145.9	87.23
11	32.988	1.58730	1.56250	0.6	16	5	0.733	1.8	13	0.665	12.6279	217.86	1724.1	66.90
12	202.031	4.76190	1.69492	0.1	27	12	3.047	10.0	90	1.463	29.2654	102.46	349.7	7.52
13	36.272	2.77778	3.03030	0.3	14	22	2.652	6.7	46	0.417	7.0048	343.64	5000.0	18.19
14	23.015	2.56410	2.12766	0.6	14	5	0.674	1.3	32	0.702	13.1839	254.45	1923.1	56.91
15	25.355	3.70370	2.17391	0.3	10	5	0.368	6.9	41	1.314	25.2717	255.10	1010.1	34.92
16	7.574	2.04082	1.63934	0.4	3	5	0.151	2.6	2	0.340	17.1556	1492.54	8333.3	60.00
17	13.770	2.50000	3.03030	0.2	3	34	0.930	3.9	37	0.141	10.6451	877.19	8333.3	34.44
18	122.923	2.04082	2.04082	0.2	32	11	2.997	2.4	51	1.426	39.7772	170.35	429.2	46.77
19	16.562	9.09091	6.25000	0.7	12	3	0.461	15.0	30	0.793	3.2433	740.74	25000.0	25.90
20	17.709	5.55556	5.88235	0.4	8	7	0.357	6.5	37	0.637	22.2767	564.97	2564.1	0.00

IDENTIF		EMPLOYMENT, INCOME AND AGRICULTURE AS A WHOLE. Indicators of Dynamics.																		Incomplete Indicat. State		Incomplete Indicat. Dyn.	
OBS	NUMPAIT	DRC66FAT	DRC66PRT	DRT66CPO	DRC66TCP	DVI66APE	DVI66PEC	DPA66GRT	DPA66GPE	DTC66PRA	DDI67CAT	DTC71PIA	DTC77TAD	DCS77CIR	DCR77AEV	DCR77EGA	DCS77GUA	DCS77UTA	DCS77LTP	DCS77TPA	EPA90GTO	EMA88GTO	DRP88GTA	DRP88GIA
1	01ARG	1.538	1.444	0.91	0.875	1.401	1.016	132	115	2.6	0.4	3.1	9.2	1.234	1.110	1.240	1.045	1.070	0.552	.	20	0.779	2.333
2	02BOL	1.220	1.134	0.42	0.920	1.270	1.153	138	104	3.1	-1.7	1.8	2.4	1.750	1.784	2.182	1.521	0.589	0.982	18	.	0.692	.
3	03BRA	1.733	1.688	0.50	1.218	1.695	1.683	165	126	4.9	-3.5	6.8	8.7	2.209	1.229	2.125	1.150	1.056	1.055	10	14	0.625	0.857
4	04COL	1.962	1.733	0.50	1.304	1.822	1.430	156	123	4.9	-1.0	3.2	0.7	1.240	1.199	1.835	1.121	1.078	1.000	28	30	0.824	1.250
5	05COS	1.759	1.105	0.50	1.360	1.235	1.257	143	110	2.5	-3.3	2.3	5.9	1.000	1.519	1.372	0.993	0.995	1.153	17	.	0.654	0.538
6	06CHI	1.579	1.600	0.71	1.235	1.418	1.184	119	99	2.3	-0.1	3.8	-1.7	1.064	1.281	1.531	1.137	0.995	1.076	7	15	0.700	.
7	07ECU	1.115	1.200	0.37	1.000	1.057	1.632	140	101	2.4	-6.4	3.9	-0.4	1.111	1.268	3.556	1.014	1.042	1.113	13	30	0.448	0.615
8	08ELS	1.240	1.051	0.37	1.000	0.983	0.887	122	88	2.8	-1.3	-4.3	5.2	5.500	1.040	2.329	1.142	1.065	1.000	27	.	0.844	0.765
9	09GUA	1.218	1.098	0.38	1.000	1.288	1.275	160	115	4.6	-1.1	1.4	0.4	1.193	1.174	1.498	1.197	1.084	0.938	.	.	.	0.583
10	10HAI	1.081	1.167	0.50	0.882	0.950	1.268	109	85	2.2	-1.8	-2.1	-2.6	1.167	1.500	1.349	1.079	1.115	0.803	.	.	.	.
11	11HON	1.111	1.203	0.33	0.912	0.953	1.080	131	91	1.5	-2.1	1.0	0.7	1.188	1.480	1.688	1.130	1.247	1.000	31	43	0.838	0.692
12	12JAM	1.857	1.119	0.50	0.933	1.349	0.815	106	89	0.7	1.8	0.6	1.8	1.269	1.160	1.353	1.051	1.132	0.886	8	50	0.800	0.773
13	13PEX	1.528	1.485	0.40	1.065	1.365	1.419	150	107	2.3	-2.9	6.4	-1.7	1.412	1.288	1.147	0.999	1.048	1.000	10	20	0.625	2.000
14	14NIC	1.590	1.255	0.34	0.765	1.107	0.666	113	79	3.1	2.2	14.3	5.3	2.000	1.011	1.616	1.051	1.067	1.005	23	.	0.958	1.556
15	15PAN	1.889	1.283	0.48	1.261	1.117	1.267	132	101	1.9	-2.1	-1.2	-4.8	1.400	1.336	1.613	1.053	1.027	1.020	.	52	.	0.667
16	16PAR	1.143	1.049	0.42	0.781	1.048	1.885	161	113	6.9	-1.7	6.7	-1.8	1.395	1.218	2.116	1.267	1.250	1.048	30	33	0.833	.
17	17PER	1.300	1.636	0.43	1.077	0.891	1.133	112	83	0.0	-1.7	12.3	8.4	1.087	0.974	1.947	1.227	1.274	1.000	8	.	0.444	1.000
18	18REP	1.367	1.429	0.40	0.900	1.204	1.551	138	103	3.1	-3.5	5.0	1.6	1.160	1.832	1.221	1.073	1.108	1.091	18	72	0.666	.
19	19URU	1.909	1.250	1.00	3.667	1.310	1.250	114	109	0.2	-3.3	-1.2	-0.4	1.633	1.257	1.440	1.031	1.224	1.009	10	26	0.526	2.000
20	20VEN	1.944	1.941	0.43	1.030	1.348	1.135	144	98	3.8	-1.2	-1.5	-2.5	1.129	1.307	2.125	1.067	1.018	1.044	6	18	1.000	0.667

APPENDIX C. METHODOLOGY USED FOR THE TYPIFICATION

Summary

The preparation of this document began with the development and application of a general methodology for classifying and typifying the countries of Latin America and the Caribbean. The methodology was based on previous experiences in the area, accumulated over a long period of time. The purpose of this exercise was to advance toward developing consistent, stable and useful typifications valid for research and for agricultural and rural development planning in the region. A secondary benefit was the production of synthetic indicators of status and dynamics in these fields, with the same final purpose. The resulting methodology, and experiences with applying it to the available sample of countries, were then used to draw a summary characterization of the identified types.

The first step in characterizing the types was to examine group information and filter it so that comparisons could be made according to the criteria of descriptive relevance and statistical significance. This process revealed a number of descriptive items that clearly, unequivocally fit into one type or another. These items were carefully separated in order clearly to establish the unique, distinguishing attributes of each of the three basic country types that had been discovered for the two broad areas covered by the classification: present state or situation, and change over time or dynamics. As an example of the procedure followed, we will examine the present state or situation and change or dynamics for the topical field of food and food security. The body of this paper contains a general methodological summary which shows that the methodology was also used in developing specific typifications for the topical fields of external sector and employment, income and agriculture as a whole.

The methodological foundation of this work was built on years of experience in the area. It reflects an idea shared in the first event held on typification in Latin America, almost a decade ago, when it was stated that:

> If similar groupings can be obtained with the use of different techniques, this would suggest that the typifying process is sound. The quantification of intra-group homogeneity is also useful for comparing techniques...It may be advisable and necessary to combine different methods and techniques 1/.

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1 COHAN, Hugo E. (ed.), Seminario sobre Métodos y Problemas en Tipificación de Empresas Agropecuarias, IICA, Series of Reports from Conferences, Courses and Meetings No. 92, Montevideo, Uruguay, December 1975, Conclusions and Recommendations, Vol.3, Chap.5, ii.c), p. 7.

This was the basis for designing and applying a methodology of classification/typification 2/, as summarized below with pertinent modifications. The final section takes a superficial look at the objectives, foundations and products of the principal techniques included in the methodology and used in this project.

General Methodology

The general methodology is used for ascertaining country types and the homogeneous groups they represent, using the assumption that there is no sound theoretical or empirical basis for comparing or cross checking results in an a priori fashion. This assumption imposes a restriction easily proven in praxis, which also reflects a very simple process of reasoning: if we have clear, unequivocal features for contrasting, in fact we already have what we were looking for--a typification.

Therefore, we must find substitutes for such "clear, unequivocal features for contrasting," which in the strictest sense are never in fact available. Although it is true that an isolated application of any appropriate technique (rudimentary, simple or complex) may produce some specific typification,

> ...the researcher must differentiate those situations in which a method reveals or confirms an interesting structure inherent to certain data or to a certain problem, from those in which the methodology itself imposes a nonexistent structure 3/.

Clearly, the search for such a substitute is inextricably bound to the process of validating the structures produced through typification and classification exercises.

Various concepts and findings in the area of validating classifications are discussed in the reference material footnoted on the previous page. They provided the basis for the methodology proposed and used for this project, which essentially was to design a filtering mechanism for groups of countries in order to generate the substitute mentioned above. This mechanism produced sound, compact matrix groups to which to apply discriminant analysis techniques for classifying observations (countries) that were temporarily rejected in the earlier filtering process.

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2 KAMINSKY, Mario, "Metodología de Regionalización Agropecuaria por Tipificación. Una aplicación al Caso de Paraguay", Desarrollo Rural en las Américas, 14(2):23-45, 1982.

3 FERREIRA, Pedro, "Algunos Comentarios sobre Evaluación de Clusterings", en COHAN, d., op. cit., Ch.4, Sec. 4.3, "Estabilidad de una Clasificación", p. 84.

In the first place, then, three alternative classifications were generated from the total of twenty Latin American countries examined, using techniques with highly differentiated objectives and natures: cluster analysis and linear principal components analysis. Two of the three alternative country groupings were produced by the two synthetic indicators obtained with the use of principal linear components analysis, according to guidelines and procedures established elsewhere 4/.

The next step was to purify the specific categories or groups that had now been defined, filtering the different countries according to how well they fit. This step would establish the minimum basic matrix groups to be used in the second analysis and was done in two phases. In the first place, both of the synthetic indicators discussed above were used for contrasting the different countries grouped together to see how closely they all fit into the same category. Those members that displayed consistency remained, and those that changed categories as a result of this process were eliminated. In the second place, the countries that still remained in specific categories after completion of the first stage were examined to determine whether they properly fit into the category assigned through the earlier cluster analysis. Again, those that proved to be consistent remained, while those that changed category or group were eliminated.

This two-step process of elimination generated the information needed for establishing the minimum basic matrix groups, or the matrix typification. It was important for each matrix group to contain only a small number of items, but to be large enough for statistical examination in the succeeding step of the methodology. It was also important for these matrix groups to display high potential internal stability/consistency/conformity, with the elimination of unstable or "volatile" observations and the retention of those that were consistently associated with other members of the same group.

The third and last step of the typification process used the basic matrix groups to generate a final classification with the attributes of conformity, consistency and stability defined for the construction of the matrix typification. This was done with the aid of discriminant analysis, briefly described in the following section. In this step, the discriminant functions ascribed to each of the three minimum basic matrix groups were used to measure the values or "projections" of countries which had been eliminated from the groups in earlier stages. These computed values were then used to classify the countries optimally, using criteria of statistical similarity to

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4 KAMINSKY, Mario, "Vinculación de Información de Censos de Vivienda y de Población en Indicadores Sintéticos de Pobreza para Caracterización de Micro Regiones Geográficas", en TORRADO, Susana (comp.), Investigación e Información Sociodemográfica 2. Los Censos de Población y Vivienda en la Década de 1980 en América Latina, CLACSO, Research Report, Population Series, Comisión de Población y Desarrollo, Buenos Aires, June 1981.

assign each country to one of the basic matrix groups. These criteria are equivalent to the method of maximum likelihood that particular observations pertain to specific groups or types. In addition, discriminant analysis provides criteria for evaluating the characteristics and validity of the matrix typification and of the secondary classification. The end product, the final and complete typification, can then be obtained by combining the results of these two classification processes.

The central concern with how to validate the typification led to the development of the proposed heuristic methodology, already used effectively in other similar projects. This same concern, sweetened with a certain dose of scepticism, suggests that before the process is complete, the results obtained should be contrasted one last time. It is suggested here that this type of final check should become a routine procedure for all typification exercises. As a minimum, the final classification should be compared to the results of an experiment to replicate the final methodological step, using a randomized selection process to establish the matrix groups.

Details and illustrations of the different steps in the general methodology have been described elsewhere, in a document that includes two sections on this empirical subject 5/. In particular, section three of the document is relatively more generous in this regard. Below are several general methodological considerations to supplement the discussion of the typification as such.

A first question to ask is why the typification is needed at all, in view of growing capabilities for analytical inference. This capability is, however, extremely limited at the two usual extremes: use of aggregates for the region as a whole, and use of indicators for each individual country. The first method is simple, but in most cases, simply inappropriate. It masks dramatic differences among countries and hides the prevailing heterogeneity already recognized at the general level, although less so in the field of agriculture and rural development. Even this masking effect is biased because of the disproportionate relative weight of the "large" countries. The second alternative, individual indicators, is also inappropriate, making it impossible (or at least very inefficient) to examine multidimensional indicators simultaneously for every single country, as needed for making inferences and generalizations useful in policy and decision making. Therefore, this paper and the resulting systematic study attempt to detect and validate groups of countries with homogeneous characteristics, in terms of structure or present

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5 Estado y Dinámica de la Agricultura y el Dessarrollo Rural en América Latina. Indicadores Sintéticos y Tipificación de Países. IICA, Directorate of Analysis and Evaluation, Fourth Latin American Congress of the Econometric Society, Santiago, Chile, July 1983, pp.11-47, and especially pp.11-30.

state or situation, and from the standpoint of dynamics or change over time. The method provides a simple, economical way to maximize the informational content of messages received from the pertinent statistical data.

The complete statistical data compiled for this paper and for future projects is given in Appendix B. Appendix A describes the set of simple indicators and the sources used. In all cases, the data used is the maximum aggregate information available at the countrty level for the most recent period. This means that for the indicators of present state or situation, the study covered 1981, 1980 or 1979. For change or dynamics, it examined the past decade in most cases. The broad array of indicators was constructed in such a way as to retrieve simple informational messages which cast light on the phenomena associated with the status of agriculture and rural development in the region. In particular, the indicators should isolate the spurious disturbing effect of the size factor of economies by deriving associations among variables of origin, frequently in the form of a ratio.

This appendix focuses on methodological considerations and minimizes the analytical components of the simple and synthetic indicators, which will be examined in future papers now being contemplated. The methodological features have been divided up approximately according to the three topical fields of major analytical interest. Each division is subdivided into indicators of present state or situation and indicators of change or dynamics.

The ideal number of country types is three. In any case, this is the maximum that can be developed with the extremely small number of statistical observations available at present, and without making the sacrifice of using an insignificantly small number of indicators. In fact, while the experiment showed that even three groups or types were overly ambitious, the intention was to establish two extreme groups or types and one intermediate or buffer group to help separate or isolate the extremes. Naturally, the major analytical interest lies in the extremes and in comparisons between them.

Because it is trying and at times tedious to examine high numbers of variables, the methodology adopted for the study was to estimate synthetic indicators based on real simple indicators. This procedure retrieved a high proportion of the available informational content. The synthetic indicators can be used in three different ways: a) as inputs to the process of typifying countries; b) in the synthetic analysis of present situations and trends of intrinsically multidimensional phenomena, which nevertheless can be compacted into a few basic latent factors; c) for future follow-up of behavior. As work progressed, concern for synthesis and simplification led to a gradual reduction of the total number of simple indicators, on the basis of various criteria. However, preference was always given to those that displayed proportionally high and statistically significant inter-group mean differences.

Techniques Used

The previous section mentioned the use of three specific techniques in developing and applying the proposed general methodology. Because these three techniques are not commonly used in projects of this type, we will give a brief descriptive summary of each one. Further developments, details and discussion can be found in the background material cited in the basic reference notes[6].

Cluster Analysis

This technique clusters or groups objects of analytical interest in order to minimize intergroup similarity and maximize intragroup similarity. It is based on distances between objects or measures of dissimilarity, or inversely, on values or coefficients of similarity.

The degree of similarity required for two objects to fall into the same group is associated with the desired level of homogeneity inside each group. This, in turn, determines the number of clusters selected for the analysis. There are several options for determining distances among objects. In this exercise, Euclidean distance was used at all times.

There are also different cluster methods, each using different computing algorithms. They can most easily be described as hierarchical or non hierarchical. In hierarchical methods, the objects are linked sequentially, and two or more that have been placed together at any stage of the cluster process remain together until the end. The two applications of the single link method used in this project were hierarchical. New isolated points (or clustered sets of points) continue to join together with other points one at a time, on the basis of distances from a previously constructed cluster. The disadvantage of this process is the very great distance that may separate the extremes of the final chain. Non hierarchical cluster methods avoid the restriction of acting in a strict sequence when adding objects (or sets of objects) to established chains.

Non hierarchical cluster methods do not produce a rigid sequential combination of objects, but instead use an iterative process that seeks to optimize some objective function. For example, the clustering criterion for the Sparks method is to minimize the sum of squares. The variable to be optimized is therefore the sum of the squares of the distances between each object or point and the center of the alternative clusters that may be formed.

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6 KAMINSKY, Mario. "Metodología de Regionalización Agropecuaria...", op. cit.

Principal Components Analysis

Principal components analysis is effective for typification and general classification because of its capability for summarizing multivariant information or messages. It begins by generating initial components. It then proceeds to examine the information content of an extensive set of variables or data of origin and incorporates a maximum amount of this information into its components. The information content of each successive principal component decreases as the number of components approaches the number of variables of origin. Each successive principal component is simply an optimal linear combination (maximizing the proportion of total variance "explained") of the variables of origin, subject to the restriction of standardization (zero mean, and unit variance) and orthogonality with regard to the rest of the components.

The calculation of values of the first components (generally one, two or three) for each observation or object therefore incorporates a maximum of information on the behavior of a numerous group of variables of origin. These results should be used for classifying the observations into types, groups or regions, whichever is the case. For this purpose, categories are developed on the basis of the values or "projections" of, for example, the first component (e.g., high values for one, medium values for another, and low values for the last). Each individual observation is assigned to one of these complete, mutually exclusive categories, according to its value or "projection." If it is decided to use two or more first principal components, the same procedure can be followed by crossing over simple categories to form compound categories. In such cases, the number of compound categories grows geometrically, as successive new components are incorporated into the classifying exercise. Even in the case of a minimum number of categories (two) per component, the use of, for example, four first components would generate $2^4 = 16$ types or groups.

For this reason, in developing this project, the countries were classified according to values for only the first principal component (in three categories) or the first and second principal linear components, combining them to construct a single synthetic indicator. This produced two alternative synthetic indicators which present advantages in the process of generating the minimum basic matrix groups that are the heart of the proposed general methodology that was used. Further detail can be found elsewhere on synthetic indicator procedures with the use of this technique and the non linear version[7].

7 KAMINSKY, Mario, "Vinculación de Información de Censos...", op. cit.

Discriminant Analysis

This method develops procedures for providing a response to the following basic question: given multiple indicators of certain characteristics or sets of variables assigned to observations or objects that derive from or belong to different populations, what linear combination of these characteristics or variables best discriminates among the groups or populations? In essence, the technique develops and then uses the pertinent discriminant functions, which are simply the same linear combinations already discussed. It is the equivalent of determining optimum weightings (coefficients) in a weighted sum of the successive differences of group means (one for each variable incorporated into the analysis). In this context, "optimum" means the set of weightings or coefficients that will maximize the square of the weighted sum, subject to the restriction of a given variance. The method in itself is "optimum" in the sense that is minimizes the undesirable effects of erroneous classification.

In order to test the hypothesis that the discriminant functions obtained in this fashion may have emerged randomly, a test statistic is computed with Mahalanobis' Generalized D^2, which is essentially a measure of the distances among groups. It is possible to judge the stability of the initial or matrix groups used as a basis for computing the discriminant functions, by observing the possible shifts or displacement of individual observations from specific groups of origin toward other competing groups found in the analysis. This also makes it possible to compute the estimated a posteriori likelihood that particular units or observations are pertinent to their particular specific groups.

In the final step lies the true importance of this technique for the proposed methodology. Discriminant analysis, by using the different estimated discriminant functions, makes it possible to classify units or observations even without knowing to which specific group they belong. The technique also provides an a posteriori estimate of the likelihood that these originally unknown observations will be optimum for the pertinent groups to which they were ascribed.

APPENDIX D. SUPPLEMENTARY STATISTICAL TABLES

TABLE D.1

ANNUAL AVERAGE GROWTH RATES OF AGRICULTURAL GDP AND TOTAL GDP IN LATIN AMERICA (%)

ITEM \ PERIOD	1971-1975	1976-1980	1981	1982
Agricultural GDP	3.9	3.2	4.5	0.0
Total GDP	6.6	5.5	1.4	-1.2

SOURCE: IDB, Economic and Social Progress in Latin America. 1983 Report. Table VII-2, p. 131.

TABLE D.2

NUMBER AND PERCENT OF ANNUAL AVERAGE NEGATIVE GROWTH RATES OF THE GROSS DOMESTIC PRODUCT (19 COUNTRIES)

ITEM \ YEAR	1979	1980	1981	1982
No. of negative rates	2	2	8	11
% of Total	11%	11%	42%	58%

SOURCE: IGLESIAS, Enrique V., "Reflexiones Sobre la Economía Latinoamericana Durante 1982", Revista de la CEPAL, No. 19, April 1983, Table 2, p. 11.

TABLE D.3

ANNUAL AVERAGE GROWTH RATES OF TOTAL PER CAPITA GDP
AND OF POPULATION IN LATIN AMERICA (%)

ITEM \ YEAR	1979	1980	1981	1982
Per Capita GDP	3.9	3.3	-1.0	-3.4
Population	2.5	2.5	2.5	2.5

SOURCE: IDB, op. cit., and IGLESIAS, op. cit.

TABLE D.4

ANNUAL AVERAGE GROWTH RATES OF PER CAPITA GDP IN THE
COUNTRIES OF LATIN AMERICA AND THE CARIBBEAN
GROUPED BY IICA'S TYPIFICATION PROCESS (%)

(Mean levels - Typification by Dynamics)

GROUP \ PERIOD	1971-75	1976-80	1971-80	1981	1982
I	2.2	4.1	3.1	-1.2	-5.8
II	2.49	1.93	2.6	.47	-4.33
III	3.36	1.44	1.1	-2.08	-4.35
TOTAL LATIN AMERICA	4.1	3.0		-1.0	-3.4

SOURCE: IDB, op. cit., and IICA.

TABLE D.5

ANNUAL AVERAGE GROWTH RATES OF THE VALUE ADDED OF THE AGRICULTURAL SECTOR IN LATIN AMERICA (%)

(Typification by Dynamics)

PERIOD / GROUP	1971-75	1976-80	1971-80	1981	1982
I	5.25	3.55	4.4	3.52	.72
II	2.87	2.5	2.7	2.87	-.9
III	1.3	1.1	1.2	4.78	1.13
TOTAL LATIN AMERICA	3.9	3.2		4.5	0.0

SOURCE: IDB, op. cit.

TABLE D.6

RATIOS OF TOTAL EXTERNAL DEBT, TOTAL GDP AND AGRICULTURAL GDP

(Percentage and ratios)

YEAR / ITEM	1976	1977	1978	1979	1980	1981	1982
Debt/Total GDP (%)	18.04	21.12	25.75	28.95	31.39	37.09	53.04
GDP/Debt Ratio	5.54	4.74	3.88	3.45	3.19	2.70	1.89
Debt/Agricultural GDP (%)				270	301	342	484
Agricultural GDP/Debt Ratio				.37	.33	.29	.21

SOURCE: IDB, op. cit.

- TABLE D.7

MARKET PRICE INDEX OF AGRICULTURAL COMMODITIES EXPORTED BY LATIN AMERICA: COTTON, SUGAR, BANANAS, COFFEE, WHEAT, SOYA, BEEF, WOOL. DEFLATED AND UNDEFLATED
(Base, 1975 : 100)

YEAR / INDEX	1975	1976	1977	1978	1979	1980	1981	1982 - QUARTERS		
								1	2	3
Undeflated	100	120.45	161.01	129.92	143.09	174.91	142.37	130.96	121.45	112.35
Deflated	100	122.91	151.90	108.27	100.06	108.64	96.85	87.31	80.97	74.40
Deflator	100	98.00	106.00	120.00	143.00	161.00	147.00	150.00	150.00	151.00

SOURCE: OAS, Boletín de Precios Internacionales, No. 93, October 1983.

TABLE D.8

WHOLESALE PRICE INDEX FOR BASIC COMMODITIES (*)

(Base, 1980 : 100)

PERIOD / Category	1978	1979	1980	1981	1982				1983				
					I	II	III	IV	JAN	FEB	MAR	APR	MAY
All products *	78.3	91.2	100	85.2	79.3	75.3	72.7	72.4	73.3	74.8	75.6	78.2	79.8
Foodstuffs	65.3	74.5	100	86.1	72.9	69.9	65.6	63.6	64.3	66.1	67.6	72.0	74.5
Agricultural raw materials	78.8	96.0	100	90.3	79.5	80.0	78.2	74.0	75.4	77.7	81.1	83.3	82.6

* Aluminium (Canada (U.K.)), Beef (from all sources (USA ports)), Cacao (New York and London), Coffee (other milds, New York, Uganda), Copper (U.K.), Copra (Philippines (European ports)), Cotton (Liverpool index), Fishmeal (all sources Hamburg), Peanut cake (all sources Europe), Peanut oil (Western Africa (Europe)), Leather (United States, Chicago), Iron Ore (Brazil, North Sea ports), Jute (Bangladesh), Lamb (New Zealand (London)), Lead (U.K. (London)), Corn (United States (Gulf ports)), Nickel, Palm Oil, Rice, Rubber, Sisal, Soya Seed, Soya flour, Sugar, Tea, Tin, Wheat, Wool, Zinc.

SOURCE: IMF, International Financial Statistics, July 1983, p. 58-59

TABLE D.9

UNIT VALUE INDICES OF EXPORTS AND IMPORTS FOR
6 COUNTRIES* OF LATIN AMERICA AND
THE CARIBBEAN

Unit Value indices (prices) in U.S.A. dollars

(Base, 1980 : 100)

PERIOD / ITEM	1978	1979	1980	1981	1982		
					I	II	III
A. Unit Value Exp.	76	87	100	95	91	90	88
B. Unit Value Imp.	67	79	100	111	110	106	104
A/B	1.134	1.101	1	.856	.827	.849	.846

* Brazil, Colombia, Dominican Republic, Ecuador, El Salvador, Peru.

SOURCE: IMF, International Financial Statistics, July 1983, p. 56-57

TABLE D.10

LATIN AMERICA: WEIGHTED INDICES OF QUARTERLY PRICES IN WORLD MARKETS FOR PRIMARY EXPORT COMMODITIES (1981.I: 100), CURRENT VALUES, 1978-1982

YEAR		Foodstuffs	Agricultural raw materials	Non fuel materials	Crude Oil	11 products (excluding petroleum)
1978	I	118.5	73.0	78.4	40.0	103.8
	II	109.3	78.2	75.5	40.0	97.6
	III	94.6	76.1	79.7	40.0	89.0
	IV	97.1	81.2	85.5	40.0	92.7
1979	I	90.6	82.3	99.1	42.0	92.5
	II	107.9	82.9	103.0	45.0	104.5
	III	128.7	84.1	103.9	56.0	118.2
	IV	132.1	84.4	112.2	69.0	122.9
1980	I	119.6	92.7	133.4	81.0	121.8
	II	128.7	90.0	113.6	88.0	121.7
	III	106.7	99.3	112.6	92.0	107.9
	IV	97.3	104.4	111.1	98.0	101.8
1981	I	100.0	100.0	100.0	100.0	100.0
	II	93.4	93.4	100.9	100.0	95.6
	III	90.2	85.3	99.2	100.0	92.5
	IV	99.7	78.0	96.9	107.0	97.6
1982	I	101.5	76.3	92.4	105.0	97.4
	II	99.6	80.0	93.0	104.0	96.5
	III	95.3	77.5	91.9	104.0	93.3
	IV	94.6	71.3	92.5	104.0	92.6

SOURCE: IDB, Economic and Social Progress in Latin America. 1983 Report, p. 411

TABLE D.11

LATIN AMERICA: QUARTERLY PRICES IN WORLD MARKETS FOR PRIMARY EXPORT COMMODITIES, CURRENT VALUES, 1978-1982

Year		Beef	Corn	Banana	Sugar	Coffee				Cacao	Soya	Cotton	
		U.S.A. (ct/k)	U.S.A. ($/mt)	any origin (ct/kg)	World (ct/kg)	Brazil	Colombia (cts/kg)	Guatemala	Angola	Ghana (ct/k)	U.S.A. ($/mt)	Mexico (cts/kg)	U.S.A.
1978	I	n.a.	101.1	28.7	18.4	429.5	434.6	420.1	374.5	306.2	250.3	152.6	127.2
	II	n.a.	110.2	28.7	16.3	371.5	425.3	378.1	317.5	319.0	286.0	160.9	134.0
	III	n.a.	93.4	28.7	15.9	327.4	392.2	313.7	295.4	342.2	264.0	158.7	140.2
	IV	n.a.	98.4	28.7	18.4	329.1	381.1	315.6	313.3	393.5	273.0	170.5	154.5
1979	I	n.a.	107.3	30.0	17.8	296.9	322.0	279.3	294.7	351.8	297.3	167.5	147.7
	II	n.a.	114.8	37.1	17.5	360.1	361.9	352.7	351.5	336.2	307.3	167.3	145.6
	III	n.a.	122.4	31.2	20.1	448.7	469.6	446.8	418.8	319.4	305.3	171.1	149.7
	IV	n.a.	117.5	32.0	29.8	469.3	463.3	457.3	395.8	308.7	281.0	176.6	154.7
1980	I	n.a.	109.0	38.6	43.8	451.4	421.6	377.0	364.1	316.5	267.7	202.2	176.1
	II	n.a.	110.6	39.1	61.0	456.6	430.8	411.2	271.9	266.5	258.0	196.6	174.6
	III	n.a.	137.7	34.2	69.2	461.1	407.6	314.3	297.5	238.8	315.7	210.6	193.3
	IV	n.a.	142.8	37.5	78.7	464.1	314.9	268.1	266.5	219.6	343.6	219.1	204.8
1981	I	258.5	144.7	42.7	54.8	485.0	n.a.	286.5	258.2	208.3	311.4	213.5	200.7
	II	248.6	141.0	42.1	36.2	361.8	300.8	273.5	224.5	190.2	304.3	196.5	188.9
	III	243.9	126.7	35.7	31.6	269.3	322.6	264.8	196.8	221.4	280.2	179.0	163.3
	IV	238.8	110.7	40.0	27.1	317.4	337.0	307.4	227.0	221.6	257.8	163.4	144.9
1982	I	238.1	114.0	41.0	27.4	306.4	339.8	313.5	245.8	207.5	256.8	158.6	138.1
	II	239.9	116.9	43.8	18.0	319.1	330.0	313.1	229.9	167.0	262.7	167.7	143.6
	III	229.8	106.0	32.6	15.0	319.7	314.5	306.2	231.8	159.6	233.0	167.3	152.9
	IV	248.0	100.0	32.3	13.8	302.2	326.2	302.1	272.4	160.2	225.7	151.3	145.1

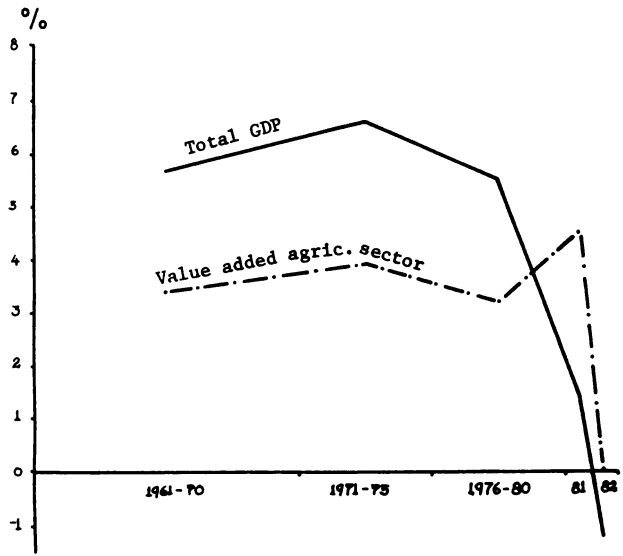
SOURCE: IDB, Economic and Social Progress in Latin America. 1983 Report, p. 407

APPENDIX E. SUPPLEMENTARY GRAPHS

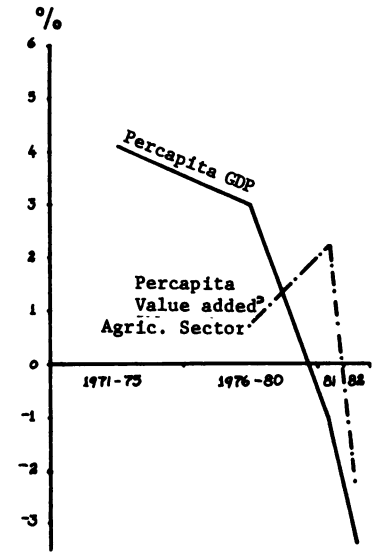
GRAPH E.1

LATIN AMERICA AND THE CARIBBEAN

A. ANNUAL AVERAGE GROWTH RATES OF THE TOTAL GROSS DOMESTIC PRODUCT AND VALUE ADDED OF THE AGRICULTURAL SECTOR



B. ANNUAL AVERAGE GROWTH RATES OF THE PERCAPITA GROSS DOMESTIC PRODUCT AND OF THE VALUE ADDED OF THE AGRICULTURAL SECTOR

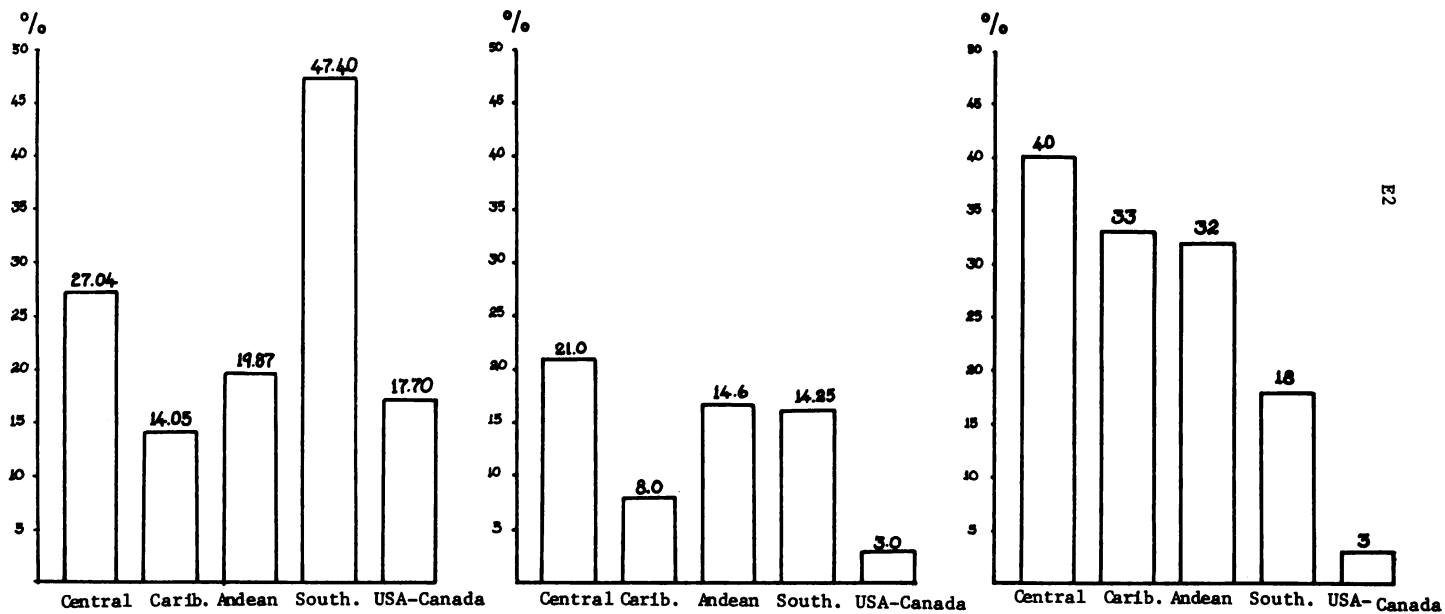


GRAPH E.2 GEOGRAPHIC AREAS OF IICA, USA AND CANADA

A. AGRICULTURAL EXPORTS AS A PERCENT OF TOTAL EXPORTS
1980

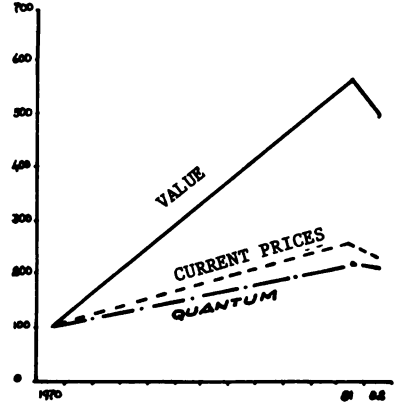
B AGGREGATE VALUE OF THE AGRICULTURAL SECTOR AS A PERCENT OF TOTAL GROSS DOMESTIC PRODUCT
1980

C. LABOR FORCE ENGAGED IN AGRICULTURE AS A PERCENT OF TOTAL LABOR FORCE
1980

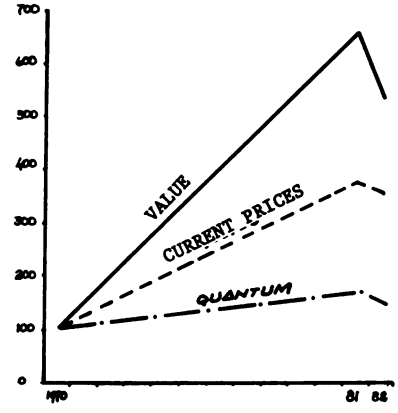


GRAPH E. 3 SIXTEEN NON OIL EXPORTING COUNTRIES IN LATIN AMERICA AND THE CARIBBEAN
INDICES OF VALUE, CURRENT PRICES AND QUANTUM FOR EXPORTS AND IMPORTS

(Base, 1970 : 100)



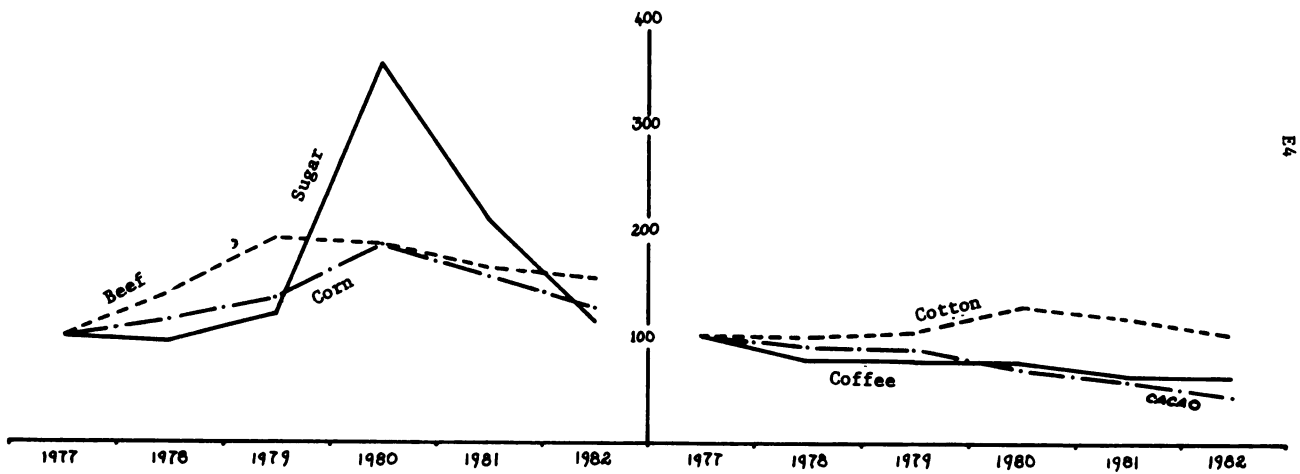
A. EXPORTS



B. IMPORTS

GRAPH E.4 LATIN AMERICA AND THE CARIBBEAN. PRICE INDICES FOR PRINCIPAL AGRICULTURAL EXPORT PRODUCTS

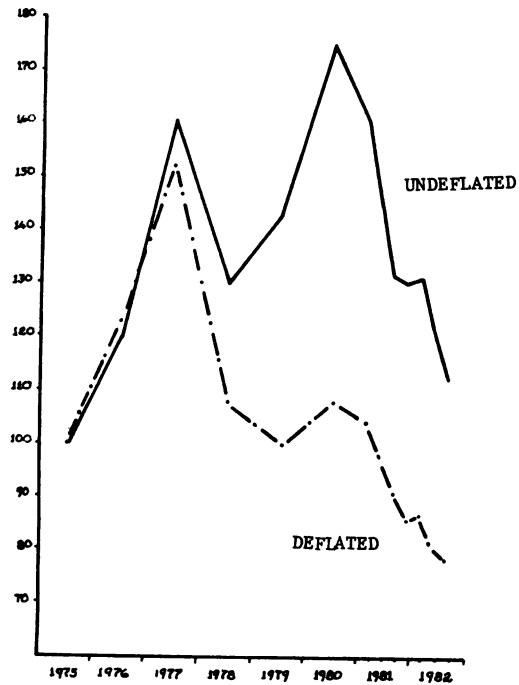
(Base, 1977 = 100)



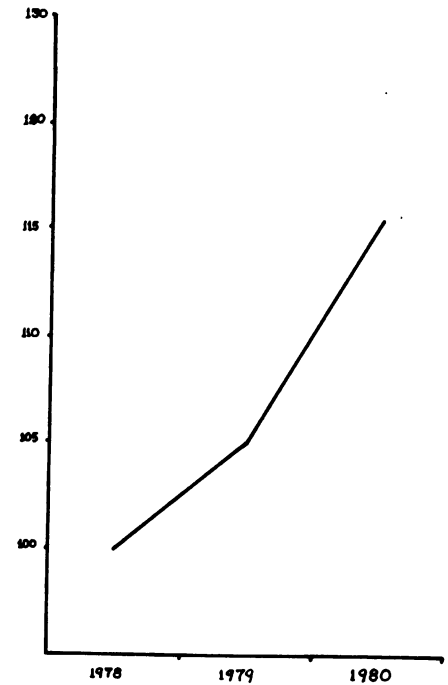
. A

. B

GRAPH E.5
MARKET PRICE INDICES (DEFLATED AND UNDEFLATED) OF PRINCIPAL AGRICULTURAL EXPORT PRODUCTS OF LATIN AMERICA (cotton, sugar, bananas, coffee, cacao, wheat, soya, beef and wool)
(Base, 1975 : 100)

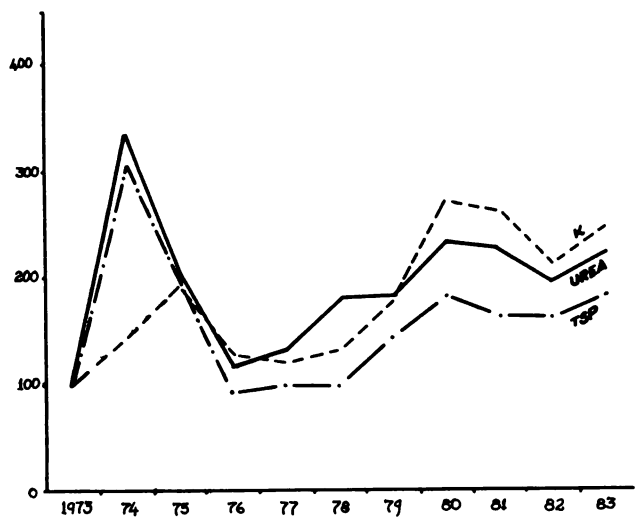


GRAPH E.6
TRACTOR PRICE INDEX, SOUTH AMERICA
(Base, 1978 : 100)



GRAPH E.7 INPUT PRICES

A. ANNUAL AVERAGE FERTILIZER PRICE INDEX: UREA, TRIPLE SUPER PHOSPHATE (TSP), AND POTASSIUM (K)
(Base, 1973 : 100)



B. ANNUAL AVERAGE OIL PRICE INDEX
(Base, 1973 : 100)

APPENDIX F

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Mario Kaminsky, Head of the Division of Studies and Analysis
Gonzalo Sáenz, Head of the Division of Institutional Support
Elizabeth M. Lewis, Head of the Language Services Unit.

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