The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

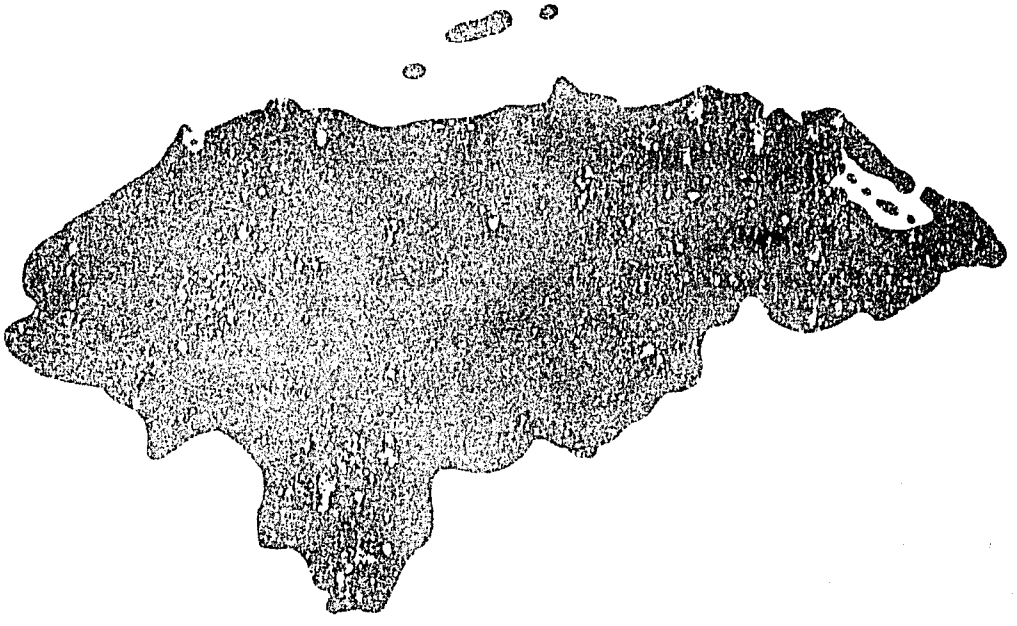
AgEcon Search
http://ageconsearch.umn.edu
aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

No endorsement of AgEcon Search or its fundraising activities by the author(s) of the following work or their employer(s) is intended or implied.

PN-AAZ-335

Agricultural Development Policies in Honduras: A Consumption Perspective



United States Department of Agriculture

Office of International Cooperation and Development

Nutrition Economics Group

In cooperation with

United States Agency for International Development

Office of Nutrition

Regional Office for Central America and Panama

Mission to Honduras

PN-AAZ-335

Agricultural Development Policies in Honduras: A Consumption Perspective

by

Magdalena García U.
Roger D. Norton
Mario Ponce Cámbar
Roberta van Haeften

United States Department of Agriculture

Office of International Cooperation and Development

Nutrition Economics Group

In cooperation with

United States Agency for International Development

Office of Nutrition

Regional Office for Central America and Panama

Mission to Honduras

February 1988

ACKNOWLEDGEMENTS

This report was prepared for the Nutrition Economics Group, Office of International Cooperation and Development, U.S. Department of Agriculture (under RSSA BST-1171-R-AG-3125-01 with the Office of Nutrition, Bureau for Science and Technology, Agency for International Development), and for the Agency for International Development's Mission to Honduras.

The authors wish to express their thanks to Tulio Rolando Girón, Carlos Solís Zuniga and Vilma Azucena Lazo for valuable assistance, and to the many members of the USAID Mission to Honduras and of the Honduran Government who were generous of their time and insights.

A note on the exchange rate: US$1.00 = 2.00 lempiras.

AGRICULTURAL DEVELOPMENT POLICIES IN HONDURAS: A CONSUMPTION PERSPECTIVE

Magdalena García U., Roger D. Norton, Mario Ponce Cámbar and Roberta van Haeften

Contents

Chapter & Section	Page
1. The Macroeconomic Setting	
The Scope of the Study	1
Main Trends in the Macro Economy	5
2. The Agricultural Sector in Honduras	
The Resource Base	9
Land Tenure and Titling	13
The Institutions of the Sector	18
Trends in Production	24
Agricultural Foreign Trade	26
3. The Structure of Farm Incomes	
Introduction	28
The Composition of Agricultural Output and Employment	29
Sources of Farm Income	32
Patterns of Land Use	34
4. Consumption and Nutrient Availability	
Introduction	39
Aggregate Trends in Consumption and Nutrient Availability	40
The Distribution of Nutrient Availability	48
Determinants of Nutrient Availability	54
The Demand for Principal Foods	61
5. Issues in Marketing Policy for Consumers	
Introduction	65
Retail Price Controls	66
The Program of Direct Retail Sales	71
6. Prices and Pricing Policy	
Introduction: Honduran Prices in International Perspective	82
The Domestic Terms of Trade	85
Trends in Product Prices at the Consumer Level	88
Producer Prices	92
Marketing Margins over Time	95
The Role of IHMA	96

(continued)

Contents (continued)

7. The Incidence of Pricing Policy
Introduction 101
Static Income Effects of Agricultural Pricing Policy 104
Incorporating Price Effects on Consumption Expenditures 111
Consumer and Producer Responsiveness 116

8. Summary and Conclusions
Introduction 118
The Aggregate Economy and the Agricultural Sector 119
Consumption Levels and Nutrient Availability 124
Marketing Programs 126
Prices and Pricing Policy 130
Concluding Remarks 134

List of Tables

1. COMPARATIVE ECONOMIC GROWTH RATES IN CENTRAL AMERICA AND PANAMA
2. SECTORAL AND AGGREGATE GDP AT FACTOR COST, 1970-86
3. POPULATION AND PER CAPITA GDP, 1970-86
4. GENERAL PRICE INDEXES, 1970-86
5. OFFICIAL MINIMUM RURAL WAGES
6. THE COMPOSITION OF AGGREGATE EXPENDITURE
7. ESTIMATES OF THE ECONOMICALLY ACTIVE POPULATION IN HONDURAS, 1960-86
8. AREA PLANTED IN MAJOR CROPS, 1970-86
9. PRODUCTION OF MAJOR CROPS, 1970-86
10. YIELDS OF THE MAJOR CROPS, 1970-84
11. AGRICULTURAL FOREIGN TRADE, 1975 AND 1984

12. COMPOSITION OF THE GROSS VALUE OF AGRICULTURAL OUTPUT, 1981
13. EMPLOYMENT IN AGRICULTURE, FORESTRY AND FISHERIES
14. STRUCTURE OF AVERAGE FARM INCOME, 1976
15. ALLOCATION OF LAND BY FARM SIZE CLASS, 1974
16. AVERAGE ALLOCATIONS OF LAND BETWEEN CROPS AND LIVESTOCK, 1974
17. ALLOCATION OF CROP LAND BY FARM SIZE, 1974
18. AVERAGE CROPPING PATTERNS BY FARM SIZE, 1974
19. AVERAGE YIELDS ON SMALLER FARMS, 1974

20. APPARENT CONSUMPTION OF CORN, 1970-84
21. APPARENT CONSUMPTION OF BEANS, 1970-84
22. APPARENT CONSUMPTION OF RICE, 1970-84
23. APPARENT CONSUMPTION OF SUGAR, 1970-84
24. APPARENT CONSUMPTION OF BANANAS AND PLANTAINS, 1970-84
25. APPARENT CONSUMPTION OF POTATOES AND CASSAVA, 1970-84
26. APPARENT CONSUMPTION OF EGGS, 1970-84
27. APPARENT CONSUMPTION OF POULTRY MEAT, 1970-84
28. APPARENT CONSUMPTION OF BEEF, 1970-84
29. APPARENT CONSUMPTION OF MILK AND MILK PRODUCTS, 1970-84
30. APPARENT CONSUMPTION OF PORK, 1970-84
31. APPARENT CONSUMPTION OF TOMATOES, 1970-84
32. PER CAPITA APPARENT CONSUMPTION OF MAJOR FOODS, 1970-84
33. APPARENT PER CAPITA DAILY CONSUMPTION OF CALORIES, BY MAJOR FOOD, 1970-72 AND 1982-84
34. APPARENT PER CAPITA CONSUMPTION OF PROTEINS, BY MAJOR FOOD, 1970-72 AND 1982-84
35. CONSUMPTION OF CALORIES AND PROTEINS BY INCOME STRATUM
36. DISTRIBUTION OF POPULATION, INCOME AND NUTRITION
37. SOURCES OF NUTRIENTS BY TYPE OF FOOD AND INCOME STRATUM, PRINCIPAL CITIES, 1978-79
38. SOURCES OF NUTRITION BY TYPE OF FOOD AND INCOME STRATUM, ALL OTHER URBAN AREAS, 1978-79
39. SOURCES OF NUTRITION BY TYPE OF FOOD AND INCOME STRATUM, RURAL AREAS, 1978-79

(continued)

List of Tables (continued)

40. PROPORTIONS OF HOUSEHOLD CONSUMPTION DERIVING FROM OWN PRODUCTION, 1978-79
41. INCOME AND AVERAGE EXPENDITURE PROPENSITIES BY STRATUM, 1978-79
42. AVERAGE WHOLESALE PRICES OF BASIC GRAINS IN CENTRAL AMERICA, 1975-83
43. CONSUMER PRICE INDEXES, FOR AGRICULTURE AND IN THE AGGREGATE, 1970-85
44. CONSUMER PRICES OF PRINCIPAL FOODS, 1970-86
45. REAL CONSUMER PRICES OF PRINCIPAL FOODS, 1970-86
46. INDEXES OF THE CONSUMER PRICE OF WHEAT FLOUR, RELATIVE TO OTHER CONSUMER PRICES
47. FARMGATE PRICES OF PRINCIPAL AGRICULTURAL PRODUCTS, 1970-83
48. DEFLATED FARMGATE PRICES FOR PRINCIPAL PRODUCTS, 1970-83
49. INDEXES OF CONSUMER-PRODUCER PRICE RATIOS, 1970-83

50. SOURCES OF NET FARM HOUSEHOLD INCOME BY FARM SIZE GROUP, 1975
51. ESTIMATED DISTRIBUTIONAL EFFECTS ON NET FARM HOUSEHOLD INCOME OF A TEN PERCENT INCREASE IN PRODUCT PRICES (1975)
52. ESTIMATED DISTRIBUTIONAL EFFECTS ON NET FARM HOUSEHOLD INCOME OF A TEN PERCENT WAGE INCREASE
53. ESTIMATED DISTRIBUTIONAL EFFECTS ON NET FARM HOUSEHOLD INCOME OF A TEN PERCENT DEVALUATION WITH MODERATE WAGE RESTRAINT
54. ANALYSIS OF SHORT-TERM RURAL CONSUMPTION EFFECTS OF CORN PRICES

EXECUTIVE SUMMARY

This study assesses the agricultural economy of Honduras from a consumption perspective. It looks at the structure of agriculture in Honduras; reviews trends in agricultural production, exports, imports and prices; and assesses the structure of farm incomes and the availability of nutrients and diets of the country's urban as well as rural population. Much of the policy discussion concerns pricing and marketing policies, as these policies are central to both the formation of farm incomes and the ability of households to satisfy their consumption needs. Other policy areas are also discussed, including question of technology development and transfer and land use policy.

The brightest spot in the Honduran economy in recent years has been the agricultural sector which has been growing faster than the rest of the economy. Over the longer-term (1970-1984), however, agriculture has expanded less rapidly than the economy as a whole; real agricultural GDP has grown less rapidly than the population; and the internal, intersectoral terms of trade have turned against agriculture since 1978, so the real purchasing power of farm incomes has actually declined since that year. Per capita consumption of calories and proteins also appears to have declined over the 1970-84 period. Two factors appear to account for this decline: (1) a decline in real per

capita private consumption, as more resources have been shifted into public consumption during a period of a stagnant economy, in terms of per capita real income; and (2) a changing mix of foods on the supply side, with increasing relative scarcity of the cheapest foods (corn and beans) in terms of the cost per unit of protein and per calorie. Analysis of household food expenditures and consumption also indicates serious problems of nutrition in poor households in both the rural and urban areas.

Many of the study's findings have important policy implications, the discussion of which can be found in chapter 8 (Summary and Conclusions) as well as scattered throughout the report. The more general thrusts of the policy orientations that have emerged from the analysis are summarized below:

1. On the whole, prices are not greatly distorted in Honduran agriculture, but they are in a few cases, and those cases have unfortunate repercussions in the agricultural economy. The sugar subsidy is costly in fiscal terms, results in an unnecessarily high price to consumers, and diverts supply side resources away from crops that would be more productive. The policy of pricing on wheat imports encourages substitution of that imported product for domestically grown staples, and also the non-uniform ex-mill prices of wheat flour encourages inefficiency in milling. The increasing dependence on imported wheat should be viewed in a context of generally increasing dependence on imported foods, and a likely slowdown in the

growth rate of exports. The negative protection afforded to beans and, to a lesser extent, to corn is a contributing factor to the poor growth performance of these two crops, which are the main ones as regards nutrition for the poor.

2. The consumer-oriented marketing programs of the Government are not attaining their primary goals of improving the diets of the poor and reducing the cost of consumption for basic food items. Yet the nutrient availability situation is quite bad for a large segment of the population. A re-thinking of these programs is warranted, for they appear to be founded on assumptions that are not very realistic, and they are incurring fiscal losses. Alternative, targeted programs could be developed that would be more effective in achieving the national goals in this area.

3. Except in the case of rice, the guaranteed price program for farmers also does not appear to be achieving its goals, so it can be asked whether the managerial and physical infrastructure of that program would not be more effectively deplcyed in other ways, for example, in providing farmers with adequate access to grain storage facilities.

4. Resources in the sector have been allocated in a way that emphasizes exports, especially traditional exports and beef, and yet a different allocation would improve domestic nutrient availability and generate more farm employment. In the domestically oriented crops, however, productivity generally is

low, and so greater efforts are needed in research and extension, particularly for the agro-climatic conditions of the mountain valleys.

5. Land use policy is a key to the preceding issue of resource allocation, and it also can be utilized to improve the overall efficiency of land use in the sector. Land use policy has been relatively passive to date, save on those occasions when it has reacted to campesino pressures for agrarian reform, but it can be used in a more active way to stimulate the land market to reallocate land at the margin toward the smaller plots. The smaller farms have substantially greater efficiency in utilizing the scarce factor of land.

In methodological terms, the study explores the fuller use of existing data bases, and demonstrates that intensive but basically simple analyses of existing data, their weaknesses notwithstanding, can provide valuable insights for both research and policy. Both time series data and cross-sectional survey data have been used for this purpose. The data used in this study are available in many, if not a majority of, developing countries, so in principle, similar analyses could be carried out in many other countries.

Chapter 1

THE MACROECONOMIC SETTING

The Scope of the Study

This study presents an analysis of the Honduran rural economy, with emphasis on income and consumption, and also of the consumption patterns in urban areas. It attempts to provide documentation of some aspects of the Honduran economy that are not sufficiently well understood, and at the same time develop some interpretations of the situation that are relevant to the formulation of policy for food and agriculture. In methodological terms, the study explores the more complete use of existing data bases, and it demonstrates that intensive but basically simple analyses of them, their weaknesses notwithstanding, can provide valuable insights for both research and policy. Both time series data and cross-sectional surveys have been brought together for this purpose. The data used are found in many, if not a majority of, developing countries, so in principle these kinds of analyses could be carried out readily in many other countries.

Honduras is one of the poorest countries in the Western Hemisphere, and a significant portion of its population suffers from an inadequate diet at least part of each year. It is a very rural country, with some 61 percent of the population still residing in rural areas, and most farmers still use

rudimentary technologies of production and have to deal with difficult environmental conditions such as uncertain rainfall and erosion of their agricultural soils. The majority of farmers have less than 3 hectares of land, and many do not have clear title to their plots. These circumstances have contributed to declining levels of agricultural output per capita and what appears to be a worsening average level of nutrition.

Hence, one of the primary aims of the study is to contribute to a better understanding of the diets in Honduras and whether they are nutritionally adequate. This includes looking at how diets vary with income and factors like urbanization, and how they are influenced by pricing policy and other public policies. Since many policies affect dietary adequacy by influencing farm incomes, the study also explores the diet-income linkages and the structure of farm incomes, and it investigates how some of the present marketing policies affect nutrient availability. Some of the findings are descriptive, such as new and improved estimates of per capita rates of intake of calories and protein, and some are more analytic, such as an analysis of the extent to which the public grain marketing agency influences product prices. A good deal of attention has been paid to documenting the findings in a series of tables, some of them quite detailed, so that the study may serve as a basis for further investigations in this

area. There are a number of important defects in the available data series in Honduras, and they have been noted for the reader throughout the report.

The report shows that malnutrition in Honduras is fairly widespread, and it is quite pronounced for some groups in the society. It is the hope of the authors that this study can enourage the formation of more effective policies for alleviating malnutrition, and also that it can help facilitate the additional studies and data collection efforts that are necessary to provide the basis for improved policies. With this orientation, there has been no hesitation about indicating areas where the analysis is inconclusive; and by the same token every attempt has been made to describe clearly those conclusions that seem firm, in spite of difficulties with the data.

This study builds on the extensive work carried out during the earlier multi-year "Study of the Effects of Agricultural Development Policies on Food Consumption in Central America," sponsored by the Central American Secretariat for Economic Integration (SIECA), the U. S. Agency for International Development, the U. S. Department of Agriculture, the Honduran Ministry of Natural Resources, and the Honduran High Council for Economic Planning (CONSUPLANE). That study produced a number of basic reports and succeeded in cleaning and processing the data tapes from the 1978-79 Household Survey of

the Ministry of Economy and Trade. Dated though that survey is, it remains the most important single source of information on household income and diets, so it is used extensively in this study. All four of the present authors participated in that earlier study, two as principal investigators (García and Ponce) and two in an advisory role (Norton and van Haeften). The opportunity to carry out the present research has permitted a consolidation of the earlier work and an extension of it in some respects, particularly as regards policy implications.

The structure of this report is as follows: The first two chapters are introductory, first at the economywide level and then at the sectoral level. They provide the basic information required to establish the framework for the later analysis. In chapter 2, there are discussions of the history of the agrarian reform movement and of the public institutions in the sector, as well as a review of the main trends in production and trade. Chapter 3 describes the structure of rural incomes, by farm size group and by agricultural product, so that the incidence can be measured for policies that affect particular products. Some implications of the analysis for land use policies are developed. Chapter 4 develops a considerable amount of information about food availabilities and their time trends and distribution. It is in this chapter that new estimates of calorie and protein availabilities are presented, and the chapter also provides some estimates of demand functions for nutrients and for major foods.

Chapter 5 deals with selected marketing issues, particularly focussing on the role of governmental marketing policies and programs at the consumer level. Chapter 6 analyzes the evolution of agricultural prices and their relation to other prices in the economy, and it discusses issues such as the role of wheat pricing in determining levels of PL 480 imports of wheat. Chapter 7 offers an analysis of the distributional effects of food pricing policy. And chapter 8 presents a summary of the main findings and recommendations that are developed throughout the report.

Main Trends in the Macro Economy

The 1960's were favorable years for growth in all Central America, and by the end of that decade the Central American Common Market was established as one of the more successful customs unions in the developing world. Then the war between Honduras and El Salvador (the "Soccer War") occurred, and Salvadoran Civil War intensified, civil conflict increased in Guatemala, and the insurgency against Somoza in Nicaragua grew and finally attained its culmination. Against the background of these events, and the oil shocks of the 1970's, there was a retreat from the economic achievements of the common market. During the 1970's real economic growth in the region generally was less than it had been in the previous two decades, and inflation rates were higher (table 1).

The Honduran economy expanded at a respectable rate from 1970 to 1979, with real GDP growing at 4.75 percent per annum, and then the growth rate slowed markedly to 1.2 percent per annum from 1979 to 1986. As a consequence, per capita real GDP declined in the latter 7 year period, and in 1986 it was lower than it had been in 1970 (tables 2 and 3). In recent years, the brightest spot in the Honduran economy has been the agricultural sector, which since 1978 has grown more rapidly than the economy as a whole (2.9 percent per year versus 1.8 percent, 1978-86). Nevertheless, even in agriculture real GDP has expanded less rapidly than the population since 1978.

The population growth rate has been high, and it even has increased slightly in recent years, to 3.5 percent per year. This growth has meant a continuously increasing rural population in spite of the rapid rate of rural-urban migration (table 3). The rural share of the population also has remained unusually high, as noted above. Honduras is primarily a rural or agricultural economy and society in all senses. The most important industries, for example, are in the food processing, livestock processing, and the manufacture of alcoholic beverages.

An implication of the trends in population and GDP is that output per worker has fared better in agriculture than in non-agriculture; it has almost certainly declined substantially in the latter sectors since 1970. The negative trend in

nonagricultural productivity is associated with a decline in average real incomes in urban areas, as urban populations expand with marginally employed immigrants from the countryside. As discussed in chapter 4, average household incomes are several times higher in urban areas than in rural areas. In combination with the proportionate shift of the population to urban areas, and the approximately constant aggregate per capita real GDP, the implication is that real per capita GDP must be declining in either rural areas or urban areas or both. The productivity trends strongly suggest that the decline is occurring in urban areas.

The relatively better performance in agriculture in recent years, with respect to the other sectors in the economy, has not led to an improvement in the relative economic position of agricultural producers. The internal intersectoral terms of trade have moved against agriculture since 1970, and especially since 1978 (table 4). Therefore, farmers have lost ground in terms of their purchasing power over nonagricultural goods and services. Table 2 quantifies this effect in its last column, by deflating nominal agricultural GDP by the nonagricultural GDP deflator. This procedure leads to an "adjusted real agricultural GDP," which is agricultural GDP expressed in units of purchasing power over nonagricultural goods and services. As may be seen from the table, that adjusted measure declined by 1.1 percent per year from 1978 to 1986.

The real official wage rates of rural field workers improved slightly from 1974 to 1981 or 1982 (table 5), but then they declined again, so that in 1986 they were only marginally above their 1974 levels. Of course, there is considerable doubt as to whether most field workers actually receive the official wage rate, but unfortunately there is no way to measure the average discrepancy between actual and official wages, nor is there a consensus on whether it has widened or narrowed over time.

Real private consumption grew more slowly than real GDP from 1970 to 1986. In per capita terms it actually declined by about 6 percent in that interval (table 6). The most rapidly growing components of GDP have been government consumption, followed by fixed capital formation. Foreign trade activities have expanded less rapidly than GDP. Thus, Honduras has become a more inward-oriented economy, and within that economy the public sector's expenditure is expanding at the expense of the private sector. Monetary policy in Honduras is very conservative, so the expansion of the share of the public sector has been possible only by a real expansion of its revenue base; that is, by shifting resources from the private sector to the public sector.

More specific aspects of the performance of the agricultural sector are discussed in the next chapter.

Chapter 2

THE AGRICULTURAL SECTOR IN HONDURAS

The Resource Base

The dominant role of agriculture in the Honduran economy can be seen from a few selected indicators. In 1986, the primary agricultural sector in Honduras accounted for about 27 percent of gross domestic product. If the food processing and marketing sectors were included, the total value added generated from agriculture would approach half of total gross domestic product. The rural share of the population was about 60 percent in 1986, and in recent years exports of agriculture, forestry and fisheries consistently have accounted for more than three-fourths of total export earnings.

The physical resource base for these contributions consists of some narrow tropical coastal plains, on both the Atlantic and the Pacific, and a large number of temperate mountain valleys in the inland regions. The total land area is 43,277 square miles (112,088 square kilometers, about the extent of Ohio). Over 75 percent of the area is mountainous, much of that forested.

Honduras has two seasons, rainy and dry. In most of the country, the rainy season generally runs from May to November, although in the northern coastal plains it begins in March. The rainfall on the northern coast varies from 70 to 110 inches

annually, and in the interior, from 40 to 70 inches. On the Pacific coast it ranges from 60 to 80 inches. The lowlands below 1,500 feet in elevation have mean annual temperatures in the range of 79° to 82° F, and in the mountain valleys, at elevations of 2,000 to 4,000 feet, the mean annual temperatures range from 66° to 73° F. In the interior, the natural vegetation is forest of pine and oak, with grasslands in the valleys, and along the coasts, tropical forests. The northeastern coast is swampy with mangrove forests. The lower mountain slopes near the coast support a considerable variety of tree species, including mahogany, Spanish cedar, balsa, rosewood, ceiba, sapota (the tree of chicle), and Castilla rubber.

The pattern of rainfall defines the cropping seasons. There is a main season (primera) and a secondary season (postrera). The area planted in main season corn typically is about four times the area planted in secondary season corn. For beans, the plantings in the two seasons are closer to equal (USAID/Honduras, 1982).

Because of the mountainous nature of the terrain, it is estimated that only 38 percent of the land has potential for use in agriculture or pastures (Ponce Cámbar, 1985). Some 60 percent of the flat lands in the country are found in the swamps of the northeast and therefore are not usable for agriculture. Most of the smallholder agriculture is found in

the mountain valleys that occupy some 515,000 hectares. In these valleys, the soils are alluvial, ranging from sandy to heavy clay soils, and they are not particularly fertile. Most are deficient in nitrogen as well as other elements. Most of the valleys do not have good possibilities for irrigation, and many lack means of communication with the rest of the country. Corn and beans are the main crops in these valleys.

The mountainous forests of the northeast also do not offer much agricultural potential. There are limited possibilities for opening up some of the valleys in that region to cultivation, with an appropriate transportation infrastructure (primarily in the Patuca watershed), but for the most part the soil in that region is thin and fragile. When the forest is removed the soil erodes quickly, exposing the underlying rock (Ponce Cámbar, 1985).

Undoubtedly the best agricultural lands are found in the northern plains, including the Valley of the Aguán, which comprise some 648,000 hectares. Greater use of this zone is possible, but it would require considerable investment in flood control and drainage works, along with more research on the conservation of tropical soils. The dominant form of exploitation of the land along the northern coast is in plantations, both private and cooperative, and ranches. Bananas and beef are the principal products of the zone.

In the country as a whole, it is estimated that some 400,000 hectares are irrigable, of which only about 15 percent

currently are irrigated. Honduras is unusual in that about 95 percent of the irrigation is supplied by private schemes, primarily for bananas, sugarcane, rice and ornamental plants. The public schemes are confined to three small irrigation districts with about 2,750 hectares under irrigation, although other projects are in the stage of planning or construction. This appears to be an area in which institutional weaknesses and lack of coordination among public agencies constitute major bottlenecks to progress.

The agricultural labor force numbers about 675,000 (table 7), of which about 45 percent are wage laborers and the rest owner-operators and unpaid family laborers. Of the wage laborers, only about one-sixth have permanent employment. About 55 percent of the rural labor force is illiterate (Ponce Cámbar, 1985). Estimates of the unemployment in rural areas are about 21 percent openly unemployed and as much as 75 percent of the rest underemployed. One of the consequences of this situation is significant malnutrition, as discussed at some length in chapter 4 of this report.

The rural employment situation will continue to be difficult, as the agricultural labor force is growing at 2.5 percent per year (table 7), in spite of a substantial flow of rural-urban migration. If the base of cultivated land were to increase at 2.5 percent per year or more, without any significant changes in the aggregate cropping patterns or

techniques of production, then the annual incremental demand for labor could absorb this increment in its supply. But, as discussed below, the long-term prospects for that rate of increase in cultivated land are not favorable, although it appears that relative price trends can have some effect. If the rate of increase in cultivated areas is not sufficient, then the needed additional employment will have to arise from intensification of the inputs to agriculture and/or from changes in output patterns, toward those products which are more labor intensive.

Land Tenure and Titling

According to the last agricultural census, that of 1974, there were 193,034 farms in Honduras, occupying a total of 2,600,000 hectares. This area represents about 61 percent of the estimated maximum amount of cultivable land. There are widely divergent estimates of the amount of pasture land, from 1.3 to 3.2 million hectares, but it appears that when pasture land is added in, then the total amount of utilized land exceeds the amount appropriate for cultivation and/or pasturage. This may well be true, for casual observation reveals that very many subsistence-level farms are located on erodable slopes that, from a viewpoint of soil management, are inappropriate for annual crops. At the same time, it is acknowledged that in 1974 there were idle public lands that

could have been cultivated. In fact in the intervening years some of those lands have been redistributed to cooperatives. There also are lands that have lain untilled because of lack of adequate drainage and flood control facilities and lack of transportation access. Thus, the overall picture is one in which both underutilized and overutilized lands coexist in Honduran agriculture.

The average size of an agricultural holding was 13.5 hectares, but almost two-thirds of the holdings (123,260 farms) had less than five hectares. For this lowest stratum of farms, the average size was 1.69 hectares. The 1974 distribution of cropland was as follows:

Stratum	No. of Farms	Area (has.)	Average Size (has.)
<5 has.	123,260	208,000	1.69
5-50 has.	61,689	912,000	14.74
>50 has.	7,885	1,480,000	187.70

(Source: Secretaría de Economía y Comercio, Censo Nacional Agropecuario, 1974, Tegucigalpa, 1978.

It can be seen that the size distribution of land holdings is highly skewed. In the lowest stratum, 64 percent of the farms hold 8 percent of the land, and in the highest stratum 4 percent of the farms and ranches account for 57 percent of the land.

In addition to the small average size of a holding, another problem affecting most Honduran farmers is the lack of

clear title to the land they work. This problem is more pronounced than in most other Latin American countries, owing to the historical practice by the central government of granting land to local (county) governments. The counties have issued certificates of usufruct rights (dominio útil) to farmers, but these rights do not constitute fee simple title, and therefore the land cannot be used as collateral for agricultural credit (Seligson et al., 1983). It is estimated that only 1 percent of Honduran farmers have fee simple title to their land. In recognition of this problem, a program of land titling has been launched recently, with the support of the USAID Mission in Honduras.

The inequality of land distribution has been a concern of Honduran lawmakers for a very long time, but it has been only in the last 25 years that significant steps have been taken to redistribute land. The country's first agrarian law was passed in 1829, and subsequent agrarian laws were passed in 1924, 1936, 1962, and 1975. Under the law of 1924, some state lands were redistributed to farm families, but owing to the lack of programs of technical and financial assistance to small farmers the lands tended to be sold and became concentrated once again, this time in the hands of larger-scale private owners. (Much of the discussion in this section is based on Ponce Cámbar, 1986.)

In the 1950's there were a number of demonstrations of discontent with the prevailing land distribution on the part of

smallholding farmers and landless laborers, especially in the southern part of the country. There were invasions of large farms and some incidents of rural violence. In 1950, the Honduran government had to intervene and purchase some land in dispute in Choluteca and distribute it to 170 squatter families.

These pressures and another forces resulted in the Agrarian Reform Law of 1962. The other forces that contributed to this result were external: the impetus toward programs of greater equity that was provided by the Alliance for Progress, the triumph of the Cuban Revolution, and the reform-oriented activities of Canadian and American priests.

The law provided for the distribution of land to individual owners, in parcels of not less than 5 hectares each, and for the formation of campesino associations. The National Agrarian Institute (INA) was created as the executive organ of the law.

Within a year, the momentum toward agrarian reform had been arrested. First, a decree was passed that required full cash payment to the expropriated owners, a provision that severely limited the ability of the INA to carry out land redistribution. Then a coup d'etat occurred, and the new rulers were not in sympathy with agrarian reform. They implemented a series of dispositions that gave guarantees against expropriation to many landowners, thus further limiting the scope of action of INA.

One aspect of the 1962 law that had lasting effects was the legalization of campesino organizations. The two main organizations formed were the National Association of Honduran Campesinos (ANACH) and the National Union of Campesinos (UNC). These two organizations played a significant role in the increasing pressures for redistribution, including the many invasions of land by squatters that occurred in the 1968-72 period. A massive campesino march on Tegucigalpa was organized for December 5, 1972, and that threat contributed to the decision of the military to mount another coup.

As a consequence of these events, another agrarian reform disposition was issued on December 26, 1972, Legal Decree No. 8. Under that decree, more than 100,000 hectares of land were redistributed in 1973 and 1974. The operative form of redistribution was to cooperatives, in spite of the provisions in the 1962 law which permitted land distribution to individual owner-operators. The Agrarian Reform Law of 1975 was the first to give explicit juridical status to the cooperatives.

The rest of the decade of the 1970's and the early 1980's were marked by a slowing down of the pace of the reform, by campesino restiveness, and by occasional violence over this issue.

As of the end of 1984, there were 1,941 agricultural cooperatives in the country, with 48,129 active members, cultivating 215,136 hectares of land (Instituto Nacional

Agrario, 1985). In some crops, these cooperatives have achieved yields equal or superior to the national average, but because of organizational weaknesses and lack of access to sufficient quantities of inputs, almost two-thirds of their cultivable land is not utilized. Thus, in overall terms, their economic performance has been below the average for the sector. Honduras is now in a period of re-thinking its agrarian reform stategy, and it appears that it may be appropriate to explore ways to make viable the strategy of redistribution to individual owner-operators or, at least, to improve the efficiency of the cooperatives.

The Institutions of the Sector

A large number of public institutions have activities in the agricultural sector, organizations such as the Ministries of Communications and Transportation, Education, Health, and Labor; and the National Electricity Company, the Honduran Corporation for Forestry Development, and others. Those which are strictly involved in food and agriculture, or which have a dominant role in agricultural policy formation, are the following eleven agencies:

1) The Ministry of Natural Resources (Secretaría de Recursos Naturales)

2) The High Council for Economic Planning (Consejo Superior de Planificación Económica, CONSUPLANE)

3) The Commission for Agricultural Policy (Comisión de Política Agrícola, CPA)

4) The National Agrarian Institute (Instituto Nacional Agrario, INA)

5) The Honduran Banana Corporation (Corporación Hondureña del Banano, COHBANA)

6) The National Bank for Agricultural Development (Banco Nacional de Desarrollo Agrícola, BANADESA)

7) The Honduran Institute for Agricultural Marketing (Instituto Hondureño de Mercadeo Agrícola, IHMA)

8) The Honduran Coffee Institute (Instituto Hondureño del Café, IHCAFE)

9) The Bureau of Cooperative Development (Dirección de Fomento Cooperativo)

10) The National Supply Agency for Basic Products (Suplidora Nacional de Productos Básicos, BANASUPRO)

11) The National Board for Social Welfare (Junta Nacional de Bienestar Social)

The Ministry of Natural Resources is the agency charged with the implementation of agricultural policy as it affects producers, and with the management of natural resources. In practice, its largest programs (by funding level) are those dedicated to agricultural research and extension. The Ministry was created by Legal Decree No. 8 on January 10, 1955. To carry out its operations more effectively it has established seven regional offices which are the main operational entities. (Note: The discussion in this section is based in large part on SIECA, 1983.)

Agricultural policy is established by two agencies, CONSUPLANE and the Comisión de Política Agrícola. In general,

CONSUPLANE has responsibility for formulating economic policy and for coordinating the projects funded by international agencies. Within CONSUPLANE, the plans and programs are developed by the Technical Secretariat, in consultation with the Bureau of Agricultural Planning. In turn, these units of CONSUPLANE coordinate their activities with the Bureau of Sectoral Planning of the Ministry of Natural Resources. CONSUPLANE was established on October 7, 1965, but a predecessor organization, the Organizing Committee of the National Development Plan, had been founded on October 26, 1954.

The Commission for Agricultural Policy was established at the beginning of 1977 to set priorities for public programs in agriculture, to supervise the implementation of land reform, and to generally monitor the progress of agricultural development and resolve specific issues of national importance as they arise. It also is charged with making proposals for administrative reform within the agricultural sector's institutions. The commission is composed of the Ministers of Finance, Economy and Trade, and Natural Resources, plus the Executive Secretary of CONSUPLANE and the Executive Director of the National Agrarian Institute.

Although one of the main concerns that led to the creation of the commission was the land reform situation, in general the commission is the entity responsible for ensuring coordination

of policy, as it is implemented in the different agencies of the sector, and also for ensuring its consistency with national objectives and for monitoring and evaluating the projects and programs in the sector. In practice, the commission carries out its work through the Planning Committee for the Public Agricultural Sector (COPLAN), and through the Regional Agricultural Committees (CARs) that meet at least once a month to bring together representatives of the different public agencies that have programs in each region.

The other agencies in the sector have more specific responsibilities, and their titles more or less explain their purposes. From the viewpoint of this study, the two most relevant of these other agencies are IHMA and BANASUPRO. IHMA is charged with stabilizing the prices of basic products in domestic markets, creating adequate producer incentives for those products, and ensuring a sufficient supply of those products for consumers. It also has a mandate to promote and carry out the marketing of those and other agricultural products.

IHMA was chartered by Legal Decree No. 592 in 1978, as the successor to the Division of Cereals Storage and Marketing of BANADESA (then called the Banco National de Fomento). Since that time, IHMA's basic problem has been the lack of a budget; that is, a governmental subsidy for its operations. It is supposed to be self-sufficient financially, but the attempts to

meet its mandated objectives have resulted in a series of large budget deficits. To date, these deficits have been offset by the sales of donated foods from the European Community, but that source of funding is coming to an end. IHMA's functions and operations are now under close review, and proposals for changes are being developed.

IHMA has confined its operations essentially to four basic commodities: corn, beans, sorghum and rice. It also is the agency for the importation of PL 480 wheat from the United States, but storage of the wheat is handled by the millers. IHMA sets guaranteed prices to the producers of the basic domestic products, controls foreign trade in those products, and owns and operates storage facilities. It also collects information on production and markets, provides technical marketing assistance to private and public agents, and carries out other related tasks.

While IHMA's operations are widespread geographically, in many cases producers are unable to sell directly to IHMA and therefore do not receive the guaranteed price (Economic Perspectives Inc., 1986). Also, sometimes IHMA is unable to make timely payment. IHMA does not buy from all producers but only from those who are registered to sell to IHMA. In the country as a whole, there are 2,799 producer groups and 3,351 individual producers that are registered with IHMA (as of May 1986). This represents a minority of producers.

Apart from these issues, IHMA has a number of other problems, such as lack of continuity in top management, high rates of staff turnover, inadequate numbers of technical staff, and high unit costs of operation (Economic Perspectives Inc., 1986). This report does not go into those issues, as they are being examined elsewhere, but it does examine in chapter 6 the impact on the market prices of IHMA's buying and selling operations.

BANASUPRO is a public entity that owns and operates a chain of food stores throughout the nation. The motive for these operations is to supply basic foods at stable and subsidized prices to consumers, particularly to poorer consumers. As of January of 1986, BANASUPRO owned 98 stores, 65 of which it operated directly, 30 of which were concessions, and 3 of which were mobile units.

BANASUPRO was formed in June of 1974 by the Banco Nacional de Fomento, and it was reorganized as an independent entity and given juridical status by Decree Law No. 1049 of July 1980. In addition to its retail operations, it is authorized to enter into contracts with producer groups and it is permitted to import consumer goods free of duty. It does not receive a subsidy from the Government, but it may incur debt and receive external donations.

The operations of this agency also are currently under review in Honduras. There are a number of questions about its

operational efficiency, but the main policy questions would appear to be the following: (1) Whether it is in fact reaching mostly the target group in the population, and (2) Whether this kind of operation is a cost-effective and fiscally viable way to extend food subsidies to poor families. BANASUPRO is discussed in greater length in chapter 5 of this study.

Trends in Production

As noted in chapter 1, real GDP in agriculture has been expanding at about 2.6 percent per year since 1970, significantly less rapidly than the population. Roughly three-quarters of that growth has been accounted for by increases in productivity (unit yields), and the remainder by expansion of the arable land. While the overall growth performance has been somewhat disappointing, output of a number of products has expanded quite rapidly. Rice has grown by 7.0 percent per year in the 1970-1986 period, coffee by 4.9 percent, cotton by 7.6 percent, pineapples by 33.3 percent (1970-1983), and sugarcane by 7.4 percent (table 9). Among the crops not shown in the table, oil palm (mostly grown in cooperatives) and tobacco also have expanded rapidly in production. Among the livestock products, the growth of poultry output has been notable, at 11.8 percent per year.

The sector's overall growth performance has been held down by slow growth rates in corn, sorghum, beef and milk, and

negative growth rates in beans, cassava, bananas, and pork. In value of output, bananas and corn are two of the three leading products (the other one being coffee), so their weight is the primary cause of low overall rate of growth.

Table 2.2 shows the trends in areas planted by crop and by group of crops. In the aggregate for the 20 major crops, the area planted expanded by only 0.7 percent per year from 1970 to 1983. However, the traditional export crops and crops such as sesame, pineapples, and cantaloupe expanded more rapidly in area. Thus, the composition of production has been changing significantly, and evidently farmers have been responding to perceived market opportunities.

An interesting aspect of the trend emerges when the historical period is divided into subperiods. From 1970 to 1978, the cultivated area expanded at the very rapid rate of 4.2 percent per year; after that, the rate was negative. This behavior coincides with the pattern observed in the agricultural terms of trade (chapter 1): they improved up until 1978 and thereafter deteriorated. While this observation does not prove the existence of a relationship between areas planted and prices, it is consistent with such a relationship, and econometric studies in many developing countries have confirmed such a relationship. Thus, it seems likely that price trends have had at least some influence on the areas planted over time.

The momentum in production growth was maintained in recent years by rapid yield growth in high value commodities like coffee, cotton, tomatoes, onions, and pineapples, and also in other crops such as sugarcane and potatoes (table 10). In the longer run, however, as yield growth rates settle down to longer term trend rates, the rate of expansion of cultivated land will become a brake on sector growth, unless it can be accelerated.

Agricultural Foreign Trade

It was noted previously that agriculture is by far Honduras' main source of export earnings. In addition, the net agricultural trade balance has been improving, as shown in table 11. It increased from about 110 million lempiras in 1975 to about 846 million lempiras in 1984. (That represents an increase of 669 percent, and during that period, the GDP deflator increased by 97 percent.) Over those nine years, agricultural exports, in current lempiras, grew by 13.4 percent per year, while the GDP deflator increased by 7.8 percent per year.

The main sources of this improvement were bananas (mostly external price effects), coffee (also external price effects), seafood, sugar, tobacco, pineapples, beef products, vegetable oils and other fruits. On the import side, the largest increases, in lempiras, were registered by milk, wheat, feeds,

and again by oilseeds and vegetable oils. The behavior of vegetable oils is explained by the development of an exportable surplus in palm oil while soybean meal is imported. Palm oil cannot be used for animal feeds (for lack of protein), while soybean meal and oil can.

For the future, the main concern about the trade performance is that it has been strongly influenced by world market price increases for bananas and coffee and by price decreases for wheat. If relative prices were to remain more or less stable in the future, then continued improvement in the agricultural trade balance would depend more on volume effect; that is, on supply behavior. In those terms a continued improvement is less likely. The largest items in the import bill will continue to be those growing most rapidly -- milk, wheat and feeds, including soybean meal. On the export side, the largest items probably will not be the most rapidly growing in the future. Once again, the production constraint, in relation to population growth, becomes the dominant concern.

Chapter 3

THE STRUCTURE OF FARM INCOMES

Introduction

The discussion in chapters 1 and 2 points out that real agricultural income (GDP) has been growing less rapidly than the population since 1970. But since 1978, the reverse has been true, with agricultural GDP increasing slightly more rapidly than either population or aggregate GDP. Over the 1970-84 period, the crop and livestock subsectors have performed about equally well. As chapter 4 shows, beef and pork output have grown less rapidly than agricultural output as a whole, and poultry and milk more rapidly. Gross output is, of course, a different concept than GDP (value added), but in the absence of information on changes in the relative prices of inputs and outputs, or in the input-intensity of production, it is assumed that the two measures have expanded at about the same rate in real terms. (In general, the use of inputs is low in Honduran agriculture, so value added probably accounts for about four-fifths of gross output.)

In this chapter, the structure of agricultural income at a point in time is examined, and the sources of employment are reviewed. The product composition of gross output is presented and discussed, and then the structure of farm income is reviewed in terms of farm earnings and off-farm earnings. And finally the structure of output by farm size class is analyzed.

In the latter section, the associated structure of land use is reviewed as well.

The findings of the chapter provide a basis for understanding the importance of different crops in generating rural income and employment, and also for measuring the relative efficiency of land use in different farm size groups and farming regimes.

The Composition of Agricultural Output and Employment

Sometimes Honduran agriculture is stereotyped as being dominated by corn and beans. While corn is one of its more important products, it alone accounts for only 9.5 percent of the value of gross agricultural output (of crops and livestock). Beans account for 2.2 percent (table 12). A more accurate stereotype would say that the agricultural economy is dominated by corn, bananas, coffee and beef. Those four products together account for about 70 percent of gross output. (Here output is measured by the 27 main products, but they almost certainly account for more than 90 percent of the true total output, so the 27 products will be used to define output in the sector.)

Bananas are the single most important product, comprising almost 30 percent of output value. Bananas and coffee together comprise about half of the sector's output, and of course they are easily the most important export products (table 11). In a

very real sense, the fortunes of Honduran agriculture are dependent on the state of world markets for these two products.

After the principal four crops, the next in importance are pineapples (which have grown very rapidly), sugarcane, poultry and pork, and then beans, tobacco and eggs. These products are followed by cotton and rice, and then sorghum, plantain and palm oil.

After the main four products, the sector is quite diversified. (See also the longer list of products in table 18, including its footnote.) Nevertheless, another valid generalization is that the sector is dominated by export products: bananas, coffee, beef, pineapples, sugarcane, tobacco, cotton, and palm oil -- although some of these products, particularly cotton and sugar, have a considerable domestic market as well. Of those products, unfortunately only two of the lesser ones, pineapples and palm oil, can be said to have encouraging world market prospects over the medium term, and recently the world price of palm oil has weakened. Thus, while these export products will continue to be important, achievement of higher sectoral growth rates in the future will require development of additional export products and improvement of the growth performance of domestically oriented products. Some new exports have emerged already, such as citrus fruit and tomatoes, and a few domestic products, especially poultry, have expanded rapidly, but those trends need to be strengthened.

When these products are looked at from a viewpoint of employment creation, the perspective is somewhat different (table 13). The main four products are the same, but while bananas generate about 30 percent of the sector's gross income they generate only about 7 percent of its employment. Conversely, while corn's output share is only about 10 percent, its employment share is about 24 percent. One way of reading those figures is to say that expansion of the corn acreage should be given priority in policy, but another way of reading them is to say that labor productivity is much higher in bananas. It is true that the wages on banana plantations are much higher than the implicit subsistence wages that most corn farmers in the mountain valleys receive. Thus, a policy implication is that priority needs to be given to improving productivity (yields) in corn farming, as much as increasing acreage, so that corn farmers can receive higher returns. This conclusion is supported by the fact that Honduran corn yields (table 10) are low by Latin American standards, although the apparent jump in yields in 1982-84 is cause for some optimism.

Corn and coffee are the major generators of employment in the sector, followed at a distance by beef, bananas, tobacco, sugarcane, beans, and then sorghum and milk. In regard to employment, the domestically oriented products are somewhat more important than they are in regard to the value of output. On the whole, with the major exception of coffee, the domestic

products have a higher employment-output ratio. Thus, the corn-bananas contrast can be generalized in the entire sector: emphasizing products for the domestic market will tend to create more employment than emphasizing export products will; but by the same token the productivity of labor in the domestic products is lower, so the economic returns of each unit of labor will tend to be lower in those products. Raising productivity would appear to be necessarily a central concern in any strategy for development of Honduran agriculture.

Sources of Farm Income

Many Honduran farmers work at a variety of off-farm occupations, including some that are directly related to agriculture, such as small-scale food processing and marketing activities. More than half gain at least a quarter of their income from off-farm work. As might be expected, the smaller the farm, the greater the need for off-farm work, as table 3.3 shows. For the farmers with less than two hectares of land, almost two-fifths of their family income derives from employment off the farm.

As a farmer acquires control over more land, and accordingly reduces the time spent in off-farm occupations, his total family income increases, but it increases proportionately much less than the land holding does. Having a larger plot of land implies making greater expenditures on agricultural

inputs, including hired labor and, eventually, machinery services. Therefore the net returns per hectare fall.

This phenomenon can be seen clearly in the numbers in tables 14 and 15. For farms of 0-2 hectares, the farming income per hectare was 584 lempiras, in the mid-1970's. Yet for farms of 10-20 hectares, the farming income per hectare was only 216 lempiras. This drop is especially pronounced in moving from the 0-2 hectare class to the 3-5 hectare class. In moving between those classes, the average land holding expands by 3.8 times (table 15), but the average amount of farming income expands by only 2.2 times (table 14). When the proportionate drop in off-farm work is taken into account, the corresponding increase in average family income is only 1.75 times.

This tendency for income per hectare to decline diminishes after reaching the size of 5 hectares. That size appears to be a kind of threshold for becoming successfully established as a commercial farmer, with above-subsistence income levels for the family. It is the point beyond which increases in input costs no longer absorb such a large portion of the increase in gross earnings, at the margin. One implication is that agrarian reform activities should not create new farms of less than 5 hectares, and in fact that is the law in Honduras.

Patterns of Land Use

The share of farm income arising out of annual crops bears an inverse relationship to the farm size. For the smallest class of farms, 78 percent of the farm's acreage is in annual crops, whereas for the largest farms only 6 percent is. Perennial crops show an uneven pattern of behavior with respect to farm size, in terms of the share of the land occupied, but in absolute acreage they increase continuously as the farm gets larger. For the smallest farms, annual crops occupy over six times the area that perennials do, while for the largest farms the two kinds of crops occupy similar acreages (table 15). Clearly the ability to make the investment that is required by perennials increases with farm size, which is a rough proxy for wealth.

The most striking change in land use patterns as the farm size changes concerns the area in pasture. For the smallest farms, 3 percent of the land is in pasture, and for the largest, 61 percent (tables 15 and 16). The largest are predominantly ranches. But even farms of 5-10 hectares allocate a substantial amount of land to pasture, about 27 percent of their holdings, or almost the same amount as is allocated to annual crops. Livestock raising is an activity that Honduran farmers prefer to go into as their size of holding increases. One evident reason is that livestock management does not require as much labor per hectare as crops

do, and therefore the farm family can manage a greater area with less reliance on hired labor by putting more of it into pasture and cattle. One consequence, however, is a lower unit return to the land on larger farms, and as arable land is a scarce resource in Honduran agriculture, this is a matter of policy concern. Contrasting farms or ranches of 10-20 hectares with those of 0-2 hectares, the average farm size is over 13 times greater, but the income from farming or ranching is only 5 times greater.

Another dimension of the greater economic efficiency (in land use) of the smaller farms is seen in table 15. For the smallest farms, about 6 percent of the land is in the relatively unproductive categories of fallow land, forest, unused land, and "other land". For farms of 10-20 hectares, about 33 percent of the land is in those categories, and forest accounts for very little of that increase. For the largest farms (20 hectares and above), about 27 percent of the land is found in those categories. The scarcity of land forces smallholders to use it more effectively.

It might be conjectured that using a higher proportion of the farm's land would result in use of marginal soils, and therefore in lower average yields on the small farms. That may be a tendency, but if so it is offset by more labor in cultivation, for yields show almost no trend with respect to farm size (table 19).

And, as would be expected from these findings, the smaller farms have greater cropping intensities. Table 17 shows the total areas planted, including double cropping, and it can be seen that the average cropping intensity is two-thirds higher on the smallest farms than it is on the largest, and in between those classes the intensity declines steadily as farm size increases.

Given the importance of using the land more effectively, these findings suggest the need to explore ways to induce more efficient patterns of land use. As indicated in chapter 2, the agrarian reform experience in Honduras has not led to more efficient land use, and so it may be appropriate to explore other modalities. From an economic viewpoint, it would appear appropriate to consider variants on land taxes. A progressive land tax would tend to lead to two responses in the sector: more intensive cropping on larger farms, including some conversion of pasture land to crops, and also partial sale of larger units so that they are reduced in size to more economically efficient units. And since at present the efficiency is noticeably lower on larger units, even a uniform land tax would have the same result, and it would be easier to administer. However, as household incomes are very low on the smaller farms, a land tax would have to have an exemption for these cases, say, for farms of less than 5 hectares, and perhaps the threshold should be even higher.

A difficulty in implementing a land tax is that an up-to-date cadaster is required, but that is required in any case for the programs of land titling that are underway, so it should be possible to overcome that hurdle eventually. A potentially more serious difficulty is that imposition of such a tax would require political consensus and sufficient political will in a sensitive area. Nevertheless, given the low level of incomes in Honduran agriculture and the importance of the land constraint, the findings of this study indicate that it would be appropriate to explore such measures.

Tables 17 and 18 also show how the cropping patterns vary over farm sizes. The larger farms are much more concentrated in traditional exports (mainly bananas, coffee and sugarcane), industrial crops (mainly cotton), rice, and fruit (citrus, plantain). However, even the farms of 3-5 and 5-10 hectares raise significantly more of these crops than the smallest farms do, in both absolute and proportionate terms. The main tradeoff over farm sizes is between crops and livestock, so an intensification of land use would tend to see crops substituted for livestock at the margin.

Interestingly, the area dedicated to corn and beans increases continuously as the farm size increases, although their share of the planted area declines. Thus, almost all Honduran farmers feel the need to grow these basic crops, even though some of them may emphasize the more sophisticated or commercial crops.

In conclusion, the data presented in this chapter help outline some of the salient characteristics of alternative development strategies for Honduran agriculture. A more export-oriented strategy, with continuing emphasis on beef as well, would earn more foreign exchange and would give higher returns to the labor employed on the more commercial farms. But on the whole it would be less labor intensive and would be consistent with the present, rather skewed distribution of land ownership. A strategy that attempted to use land market mechanisms for some redistribution of land and for intensification of cultivation practices would be consistent with a more inward-looking agriculture and would generate more employment. But it would need to be accompanied by greater emphasis on research and extension for domestic crops, in order to raise the productivity of, and returns to, labor in those crops. Thus, one of the apparent tradeoffs is between foreign exchange and employment. However, wheat imports are growing rapidly (chapter 6), and so at the margin an expansion of production of domestic staples could be expected to generate some savings in foreign exchange expenditures. It is not the purpose of this study to quantify those tradeoffs, but it does appear that there are clear alternatives in regard to strategy, and their consequences could be quantified at least approximately.

Chapter 4

CONSUMPTION AND NUTRIENT AVAILABILITY

Introduction

As in Guatemala and Mexico, Honduras' consumption habits are centered around corn, and particuarly around corn flour (masa harina) from which both the tortilla and the tamal are made. The former is the base of many different kinds of main dishes and side dishes that virtually every Honduran consumes at least weekly and many consume daily. Over time, however, the dominant role of corn in the diet has been weakening, in favor of wheat and, to a lesser extent, rice. Another staple has been beans. In 1970, beans were the second most important supplier of protein in the average Honduran diet (not only in rural areas); at that time and even in more recent years corn and beans together supplied more than half of the protein for the average Honduran. But beans, too, are declining in relative importance.

Other traditional crops have experienced even sharper declines in their importance in the average diet, particularly bananas and cassava but also potatoes. The usurpers of their roles, in addition to wheat and rice, have been sugar, plantains, vegetable oils (reflecting a change in cooking habits), and poultry. An increasing share of banana output has gone to the export market, and plantains have taken up part of

the slack in the domestic market. Vegetable oils have to some extent supplanted animal fats, and poultry has been substituted for pork at the margin. Beef and dairy products have remained more or less constant in terms of per capita consumption levels.

Thus, important changes have been occurring in dietary habits in spite of the stagnation of per capita incomes. These changes reflect a variety of forces: the availability of PL 480 imports, the effects of opportunities to increase exports of some items, lack of yield increases in others (beans, for example), urbanization, and relative price shifts. The changes aside, the Honduran diet remains quite varied. The household survey on which later analysis in this chapter is based counted some 186 food items in household consumption patterns. Quantitative analysis cannot reveal the importance that many Hondurans attach, for example, to cabbage as a regular side dish, or to pataste, an indigenous squash that is especially widespread in the Tegucigalpa area. While the main aggregate features of Honduran consumption patterns are discussed in this chapter, it should be remembered that they are simplications of the daily eating patterns of all Honduran families, whether they be rich or poor.

Aggregate Trends in Consumption and Nutrient Availability

Analysis of aggregate trends in Honduran consumption must be based on apparent consumption levels over time, and those,

in turn, are based on the national time series on production and foreign trade. There are important limitations to these data. In the first place, they are available only for major products. Second, and more importantly, those time series generally are regarded as not very reliable. Third, there exist alternative time series within the Honduran Government, and sometimes those series differ very substantially. For example, 1984 rice production as estimated by the Central Bank is double the production estimated by the Ministry of Economy and Trade.

Nevertheless, it is useful to attempt to derive some conclusions about the trends in aggregate consumption, however qualified they may be, for those conclusions have implications for trends in nutrient availability. They help answer the basic question: Are Hondurans getting better off or worse off in a nutritional sense? The review of trends also can reveal changes in the relative importance of different foods as sources of nutrition in the average diet. However, for a decomposition of food and nutrient availabilities by rural and urban areas, and by income stratum, it is necessary to have recourse to the cross-sectional survey data that are presented in the next section.

The procedure for reviewing the trends has involved two steps: constructing estimates of apparent consumption levels over time for each major food product, and then translating

those apparent consumption levels into per capita nutrient levels, where nutrient levels are measured by intake of calories and proteins. Other nutrients are important as well, but at this stage in our understanding of the Honduran situation, it was felt useful to concentrate on providing careful calculations of the calorie and protein consumption rates.

In the simplest case, apparent consumption is calculated as production plus imports less exports. That is, inventory changes are ignored. In some cases, other factors have been accounted for: industrial use (as in corn for starch), livestock feed use, retentions for seeds for the next agricultural season, and shrinkage and losses. In most cases, reasonable estimates of these factors have been developed, but it was possible to estimate the loss rate (in marketing and processing) only for a few crops, fortunately including the most important ones.

At the stage of converting the consumption trends into nutrient trends, the differences among agencies' data series were taken into account, and alternative estimates are presented for the most important cases of divergence.

Tables 20 through 31 present the estimates of apparent consumption for each of the major food products. Those tables reveal trends in foreign trade as well as in production and consumption. For example, sugar exports have been growing

rapidly, in spite of the prolonged crisis in world sugar markets; domestic rice production has been substituting for imported rice; there has been a slight tendency for net imports of corn and beans to increase; and imports of milk products have been growing more rapidly (at 6.6 percent per year) than either domestic milk production or milk consumption.

On the production side, sugar, plantains, poultry, and possibly rice (if the Central Bank figures are correct) stand out for their rapid growth rates, and bananas, cassava, beans and pork for their declines in production levels. For many obververs, the key trend is the one that shows corn production growing at less than half (1.5 percent per year) of the population growth rate (3.4 percent per year).

Table 32 displays together the apparent consumption levels for all the major products, translated into units of grams per person per day. In these units, the dominant food again is corn, followed by bananas, plantains, sugar, and then wheat. The large drop in banana consumption is a somewhat curious phenomenon, although casual evidence seems to confirm it, and consumption of plantains has increased. This drop is due more to problems on the production side than to changes in banana export levels (table 24). It would appear likely that the abruptness of the drop is exaggerated in the official data, but that as a trend it did in fact occur.

The principal discrepancies among the alternative official sources of data also are noted in table 32. They concern,

primarily, corn, rice and eggs. The data used for these tables are provided by the Ministry of Economy and Trade, and they originate with the Ministry of Natural Resources (MNR). The alternative data set is issued by the Central Bank. Neither agency has conducted annual sample surveys of production for the 1970-84 period, although an annual series of surveys was initiated in October of 1984. For this study, the MNR data have been used because they are based on field-level judgments throughout the country, whereas the Central Bank data are a secondary source, based on the MNR data and other information. However, the Central Bank data sometimes do have the virtue of greater consistency with other information, so for some products that series has been selected.

In general, the Central Bank data show higher growth rates and levels of production, although their departures from the MNR data usually are not as great as in the three products noted above. It should be pointed out also that the MNR and the Central Bank differ in regard to levels of banana exports, but those differences do not materially affect the calculations of apparent consumption. These circumstances are highly unfortunate, for they substantially hinder efforts to understand the basic time trends in Honduran agriculture.

Nevertheless, in spite of the data problems, some conclusions appear to be reasonably robust. One conclusion is that per capita food consumption levels generally declined over

the 1970-84 period. Another is that several changes in consumption patterns are occurring, as noted earlier: wheat and rice are being substituted for corn and root crops; much more sugar is being consumed; poultry is being substituted for pork, plantains for bananas, and vegetable oils (primarily palm oil) for animal fats. (In chapter 6, the role of prices is explored with respect to the increasing consumption of wheat.) These basic facts would not be altered by substitution of the Central Bank data for the MNR data.

Declining per capita food consumption, in the face of approximately constant per capita real GDP, could be explained by several trends or hypotheses. First, real private consumption has been declining slightly, with a corresponding drop in its share of GDP. As noted in chapter 1, real private consumption per capita declined by 7.5 percent from 1970 to 1984. At the margin, government consumption has been substituting for private consumption. Second, it is possible that the income distribution has been worsening. If so that would explain the trend in food consumption, for the household budget shares devoted to food are markedly lower in the higher income strata. (See table 41.) However, the available data do not permit verification of this hypothesis. And third, the declining availability of corn and beans per capita means that the most cost-effective foods, from a nutritional viewpoint, are becoming more scarce, and so consumers are forced to rely

proportionately more on other foods that are more costly per calorie and per gram of protein. (Note the generally lower cost per calorie, for the entire food budget, that is shown in rural areas in table 35; this finding is no doubt a result of proportionately greater use of corn and beans in the diet in rural areas.) Therefore a given consumer budget does not go as far as it used to in terms of obtaining the basic nutrients.

Thus, we have the decline in aggregate per capita real private consumption, the changing mix of foods from the supply side, and the possibility of changes in the income distribution, as explanations for the observed aggregate behavior of food consumption.

The nutritional implications of the time series are shown in tables 33 and 34. Average caloric availability appears to have declined by about 12 percent (although the decline would be only half that if the Central Bank data were used), and average protein availability appears to have declined by slightly more. Not much certainty can be attached to the percentage changes, but it appears safe to say that average levels of nutrient availability have not increased over the 14-year period, and it probably is safe to say they have declined slightly. The largest sources of increase in calories have been sugar and vegetable oil; but, of course, these foods contribute nothing to protein levels. Also, sugar affects the

body's metabolism in ways that other foods do not, so the increasing role of these two foods in the diet is a mixed blessing. The third largest source of improved intake of calories is wheat, which, of course, is almost entirely imported. Thus, the main positive trends in nutrition all have disadvantages. The main declines in calorie availabilities arise from the trends in availability of corn, beans, bananas, cassava and animal fats.

Wheat, poultry and possibly rice also constitute the main source of increases in protein consumption. Rice is grown primarily on larger scale farms (some of which are agrarian reform units). Thus, another implication is that the contribution of the small-scale private farmers to average nutrient availability is declining significantly. They are not important growers of wheat, rice, oil palm or sugar, and except for bananas they do raise the main crops that have negative trends in per capita output -- corn, beans and cassava (see chapter 3).

The Distribution of Consumpton and Nutrient Availability

In light of the weaknesses of the time series data, it is fortunate that cross-sectional surveys are available. The one utilized in this report is the 1978-79 Household Income and Expenditure Survey of the Ministry of Economy and Trade. That survey records purchases, rather than actual food intake, but it also records income and other household characteristics. Honduran observers consider this survey to be a more reliable source of dietary information than the time series on apparent consumption. As well as providing information on consumption patterns in the population, it also permits a better estimate of average nutrient availability at the household level.

This survey was processed previously for the purpose of compiling estimates of nutrient availabilities and other parameters of consumption behavior (see, for example, García, 1982 and 1983). Those studies are very useful, for they provided the first estimates of Honduran consumption patterns, and they are compiled in the aggregate, by income level, by occupation, and by other characteristics. Their main limitation is that they were based only on the 23 most important foods, and for that reason the estimated consumption parameters showed some puzzling behavior in a few cases. For example, the calculated nutrition intake in rural areas did not increase appreciably as income increased, in the lowest three

income strata of five. As this study is intended to be an extension of those earlier studies in some respects, one of the first steps was to go back to the surveys and increase the number of foods selected for the nutritional analysis. A total of 186 foods were chosen, and the result was an improved, and significantly different, set of nutrition estimates by income stratum. Parenthetically, an implication for nutrition studies in general is that the number of foods included in the analysis may have to be rather large, in order to obtain useful estimates.

The main results of the new cross-sectional analysis are shown in tables 35 through 39. Table 35 shows average availabilities of calories and protein, for the nation as a whole, by income stratum, and by rural-urban distinctions. For the nation as a whole, the caloric deficit, with respect to the accepted miimum standard of adequacy, is a little over 10 percent: 1,891 calories per person per day, versus a standard 2,138, for adults (Menchú, 1982). For rural areas, the average daily intake of 1,716 calories represents a deficit of 20 percent. And for the lowest income stratum in rural areas, the average intake (1,564 calories) represents a deficit of 27 percent. This last figure implies noticeable malnutrition, and as it is an average within the group, many would be experiencing severe malnutrition. Therefore, the lack of improvement of the nutrient situation over time takes on more urgency as an issue of policy.

Increasing the number of foods analyzed from 23 to 186 added about 115 calories to the estimated national average per capita daily consumption level, but in the course of expanding the sample some of the nutrient conversion factors were modified also. Thus, the change in the estimate is not entirely attributable to the expansion of the sample. For some strata, the increase in the estimated availability was quite a bit higher. For example, in rural areas, for the stratum covering incomes from 100 to 300 lempiras per month, the estimate increased by more than 200 calories.

The corresponding new figures for protein consumption represent comparable degrees of deprivation, relative to the accepted minimum daily standard for Honduras of 55 grams. Overall, for both proteins and calories, the urban poor are significantly better off than the rural poor. (The survey does include measurements of home retentions of crops and livestock.) In fact, in all income strata, those who live in urban areas apparently have higher nutrition levels than those who live in rural areas, in spite of the fact that the cost per calorie of the observed diet is higher in all cases in the urban areas.

The number of people who are experiencing some degree of malnutrition is very large in relation to Honduras' total population. The two lowest rural income strata have average daily calorie consumption levels per capita of 1,697 or less,

and they represent 55 percent of the total population. Of course, some households in that group will be better off, for those figures are group averages.

Not surprisingly, nutrient availability is distributed more evenly in the population than income is, since the poorer households spend relatively more on food. In the principal cities, the poorest 20 percent of the households receive only 5.1 percent of the income but account for 15.3 percent of the calorie intake (table 36).

The shares of nutrients that derive from different foods vary by income group and by the rural-urban distinction. At one extreme, for the rural poor, corn accounts for 56 percent of the daily calorie intake (876 out of 1,564 calories), while for the highest urban stratum (in principal cities), it accounts for only 13 percent of the daily calorie intake (337 out of 2,520 calories). See tables 37 and 39. Wheat shows an opposite pattern: the rural poor receive 10 calories per day from it, on average, while the urban rich receive 270 calories. Rural families rely much more on pork than on poultry, and urban families less so. In almost all income groups, rural families consume more beans, in absolute terms, than their counterparts in large cities. In general, consumption patterns in the smaller cities fall somewhere between those of rural areas and those of the principal cities.

A part of the rural-urban differences in consumption patterns is attributable simply to income differences.

According to the 1978-79 survey, average household incomes are 4.7 times higher in urban areas than in rural areas (table 40). This income gap is associated with the fact that 63.8 percent of the rural households are concentrated in the next-lowest stratum (100-300 lempiras per month), while in urban areas only 19.9 percent of the households are in that stratum and 53.7 percent are in the two highest strata. For a given stratum, there are rural-urban differences in average household incomes, but they are much less pronounced than the differences in the overall averages.

Some appreciation of the role of rural-urban taste differences can be gained by reviewing the consumption patterns for wheat and rice. In the highest income stratum, the rural average household income is 1,444 lempiras per month, while in the main urban areas it is 2,149 lempiras (table 40): urban incomes are 49 percent higher in that case. Wheat consumption in that stratum, however,is 251 percent higher in urban areas, and so taste differences appear to explain more of the variation than income differences do. In the case of rice, to the contrary, most of the observed rural-urban variations in consumption patterns appear to be attributable to income differences, for rice consumption in the highest stratum is only 45 percent higher in the principal cities (tables 37 and 39). These findings are confirmed with regression analysis, as discussed below.

From tables 37 and 39, it it clear that corn has a negative income elasticity within both rural and urban areas, and yet taste differences are evident as well. For any product, an "apparent income elasticity of demand" can be inferred simply by comparing the percentage change in consumption (nutrition) over income strata with the corresponding percentage change in household income levels. In urban areas, the highest apparent income elasticities of demand (from table 37) are, in order, those for poultry, pork, fish, fruit, other foods, vegetables, and root crops (!), followed by those for milk, beef, cheese, wheat, plantains, animal fats, and then rice. In other words, dairy products and beef are not nearly as income-responsive as several other kinds of foods. In rural areas, the highest apparent income elasticities, again in order, are those for pork, fruit, fish, beef, cheese, milk, wheat, plantains, and then eggs.

Urban diets are more balanced, for there are several principal sources of protein: corn, beans, beef, wheat, milk and cheese. In rural areas, the vast bulk of the proteins come only from two foods: corn and beans. Also, in rural areas, home retentions from farm production are important sources of food. As table 39 shows, as much as 79 percent of the corn consumption in farm households comes from own production, and in some cases the corresponding share is even higher for beans, milk, and eggs.

The next two sections report the results of some statistical analysis on the cross-sectional data set.

Determinants of Nutrient Availability

The preceding discussion has indicated that both income and the degree of urbanization are influential factors in determining food consumption patterns and nutrient availabilities. In this section and the following one, some simple statistical tests are made regarding the role of those and other variables. Equations are fitted to explain the cross-sectional variation in per capita daily availability of calories and proteins, and also in per capita consumption levels of selected major foods.

The possible set of explanatory variables for these tests has included household income per capita, the degree of urbanization, the family's size, and the cost per calorie of the household's consumption bundle. The observations are mean values of the variables by stratum and by the three-way urbanization classification. (For another recent Latin American consumption study that employs regressions over stratum means, see the study on Brazil by Gray, 1982.) Thus, there are fifteen observations in all: five strata by three degrees of urbanization. The urbanization variable is a dummy. It takes on the value of 1.0 if the stratum is located in one of the principal cities, 0.5 if it is in a smaller city, and zero if it is in a rural area.

The basic data for the regressions are shown in tables 35, 41 and 37-39. Before presenting the statistical results, some key characteristics of the data must be given. As table 41 indicates, income levels are extremely low in some segments of the population. For the poorest rural stratum, the average monthly income per capita is 15.76 lempiras, or US$7.88. For the next poorest rural stratum, which contains 43 percent of the total population, the average monthly income per person is US$13.43. Another perspective on the poverty is provided by the average food cost, expressed in lempiras per thousand calories (table 35). The average amount of money spent on food by the rural poor (in 1978-79) was 0.26 lempiras per thousand calories, and in that year the official minimum daily rural wage was 3 lempiras (table 5). That is, in order for the head of household to supply the minimum number of calories for each person in a family of 4.6 persons, he or she would have to find wage labor for 146 days per year, or more than half the working days per year, and that does not allow for household expenditure on any items except food. This estimate of required work is somewhat overstated, for the children in the family would require fewer calories per day, but on the other hand the prevailing actual rural wage rates have tended to lie below the official minimum wage rates. Real wages have increased slightly since that period, but not enough to alter this picture materially.

The first set of equations attempts to explain variations over strata in daily calorie availability per capita:

$$\underset{(1)}{\text{CALORIES}} = \underset{(3.120)}{824.17} + \underset{(2.763)}{1.3054}\ \text{INCAP} + \underset{(4.099)}{420.94}\ \text{URBAN} + \underset{(3.390)}{150.12}\ \text{FAMILY}$$

$R^2 = .8480$ Adj. $R^2 = .0866$ $F = 20.46$

In this equation:

INCAP = monthly household income per capita,

URBAN = the urbanization dummy variable,

FAMILY = family size.

In none of the equations attempted did the cost per calorie variable turn out to be significant. That result may in part be due to the fact that the cost per calorie is highly correlated (partial r = .81) with income per capita.

Equation (1) appears to show that income, urbanization and family size all have a significant and positive infuence on per capita calorie intake. However, before interpretations are made, it has to be pointed out that there is some multicollinearity among the explanatory variables, between income and family size (partial r = .495). In order to remove this multicollinearity, a two-stage procedure was followed. First, the family size variable was regressed on both the income and urbanization variables, and then the residual from that equation (FAMRES) was inserted in equation (1) in place of FAMILY. This procedure had the effect of including in the

revised equation only that part of family size variations that was not explained by variations in income and urbanization. To get the purified family size residual, the following equation was fitted:

$$\underset{(2)}{\text{FAMILY}} = \underset{(13.88)}{5.7875} + \underset{(2.586)}{0.00638}\ \text{INCAP} - \underset{(-2.042)}{1.1775}\ \text{URBAN}$$

$$R^2 = .4396 \qquad \text{Adj. } R^2 = .3462 \qquad F = 4.707$$

If e is the disturbance term in equation (2), then the purified residual family size (FAMRES) is e + 5.7875. Then the revised version of equation (1) is as follows:

$$\underset{(3)}{\text{CALORIES}} = \underset{(3.124)}{824.78} + \underset{(5.976)}{2.2633}\ \text{INCAP} + \underset{(2.759)}{244.12}\ \text{URBAN} + \underset{(3.389)}{150.03}\ \text{FAMRES}$$

$$R^2 = .8480 \qquad \text{Adj. } R^2 = .8065 \qquad F = 20.452$$

In overall statistical properties, equation (3) is almost identical to equation (1). However, the t-ratios in equation (3) are higher on average, and, most importantly, the coefficients for the income and urbanization variables are significantly revised. The new income coefficient is less biased than the original one, and it also has greater statistical significance.

The logarithmic forms of these equations did not fit as well, so the elasticities are calculated from the linear equations by reference to the mean values of the variables. The income elasticity of "demand for calories" turns out to be

0.11, and the corresponding elasticity with respect to family size is 0.43. (Knudsen and Scandizzo, 1982, report somewhat higher income elasticities of demand for calories, based on a cross-country analysis.) The low income elasticity is in accordance with the general patterns of consumer behavior, in which the more basic the good or service is, the lower the corresponding income elasticity.

The family size variable warrants special comment. For a given household income level, an increase in the family size, of course, tends to reduce per capita nutrition levels. Here, the equation indicates that if income per capita is held constant, the larger families provide better nutrition for their members. In other words, if a family of four, with a total income of 100 units, were compared with a family of five, with a total income of 125 units, then typically the latter family would have better nutrition levels per person in the family. The family size variable in this form does not appear to have been explored in the literature, so only speculation can be offered as to its role. It seems likely that family composition is an important factor: the larger families would have proportionately more small children, and so in the above example the additional 25 units of income would be available for feeding a small child, and that child would require less than the average consumption (per person) of the other four members. Hence, either the additional child would be better

fed than the others, thus raising the family's average nutrition level, or consumption would be reallocated among all members, in light of the higher income, with the same end effect. Nevertheless, this hypothetical explanation does not alter the finding that, holding income per capita constant, larger families have better nutrition levels.

The urbanization variable also is significant in statistical terms, and its estimated coefficient suggest that urban families have better nutrition levels than their rural counterparts with the same income per person and the same family size. A family in a small city would consume 122 more calories per person per day than would its rural counterpart, and a similar jump in nutrition would be experienced in moving from small cities to large cities. Perhaps nutrition education programs have been more effective in urban areas in Honduras. At least that possibility should be explored, for if it were true it would indicate a need to give priority to rural areas in improving nutrition education.

From a statistical viewpoint, it is important to include both the family size variable and the urbanization variable in equation (3) in order to minimize specification bias in the estimate of the income parameter.

In passing, it should be noted that equation (2) implies that family size increases as income per capita increases, and it decreases with urbanization. Given the income level per

capita, an urban family in large cities tends to be smaller by 1.2 persons that its rural counterpart.

Following the same two-stage procedure, an equation for the demand for protein was obtained:

$$(4) \quad \underset{}{\text{PROTEIN}} = \underset{}{22.650} + \underset{(2.438)}{0.1056}\ \text{INCAP} + \underset{(7.925)}{10.269}\ \text{URBAN} + \underset{(3.298)}{3.5163}\ \text{FAMRES} + \underset{(2.257)}{}$$

$R^2 = .8903$ Adj. $R^2 = .8604$ $F = 29.753$

In this case, the family size variable lost significance in the log form of the equation, but the other two variables did not:

$$(5) \quad \ln(\text{PROTEIN}) = \underset{}{3.342} + \underset{(50.75)}{0.1862}\ \ln(\text{INCAP}) + \underset{(12.52)}{0.0272}\ \ln(\text{URBAN}) + \underset{(6.101)}{}$$

$R^2 = .9482$ Adj. $R^2 = .9396$ $F = 109.89$

The income elasticities of demand for protein are similar in the two functional forms of the relationship: 0.177 in equation (4) versus 0.186 in equation (5). The fact that protein is slightly less basic than calories to daily functioning of the human organism is reflected in the higher demand elasticity for protein.

The urbanization variable is a bit more important in the case of protein, and the family size variable a bit less important. Being in a principal city, versus a rural area, adds 23 percent (10.3/45) to the per capita daily protein intake, while it adds 14 percent (244/1716) to the calorie intake, everything else equal. On a national basis, an additional

family member means each member received 8 percent (150/1891) more calories and 7 percent (3.5/52) more protein, given the same income per capita and the same degree of urbanization.

Figure 1 below shows the plot of actual and fitted values for equation (4). The observations are ordered as follows: first, principal cities, from the poorest to the richest stratum; then other urban areas, likewise from poorest to richest; and then rural areas, in the same statum order.

Plot of Actual (*) and Fitted (+) Values

Actual	Fitted	40.0	87.6
		.....	
43.0	53.7	. * +	
59.0	57.1	. + *	
64.0	62.8	. + *	
63.0	68.5	. * +	
85.0	87.6	. * +	
45.0	44.2	. +*	
55.0	51.2	. + *	
59.0	57.3	. + *	
70.0	61.4	. + *	
82.0	75.4	. + *	
40.0	40.1	+	
44.0	46.3	. * +	
53.0	52.0	. +*	
52.0	56.0	. * +	
59.0	64.2	. * +	
		.....	

Figure 1 SCATTER DIAGRAM FOR EQUATION (4)

The Demand for Principal Foods

Procedures similar to the foregoing were applied to the question of demand for individual foods, and the role of

urbanization and family size in determining that demand. Again, the 15 cross-sectional observations were utilized, so price variations could not be expected, and therefore price parameters were not estimated. (However, price elasticities by stratum and by other population groupings are available in García, 1984.)

Demand equations were estimated (by ordinary least squares) for corn, wheat, rice and beef. The dependent variable in each equation is the calories consumed via the product, as reported in tables 37-39. In all cases, statistically significant income parameters were obtained, but the significance of urbanization and family size varied from product to product. Different specifications, including linear and logarithmic variants, were tested for all four products. The final equations are as follows:

(6) $$\underset{(10.46)}{\text{CORN} = 1328.7} \underset{(-8.170)}{- 1.4849\ \text{INCAP}} - \underset{(-3.574)}{76.911\ \text{FAMRES}}$$

$R^2 = .8689$ Adj. $R^2 = .8571$ $F = 39.770$

(7) $$\underset{(-4.346)}{\text{WHEAT} = 148.335} + \underset{(9.680)}{0.4738\ \text{INCAP}} + \underset{(8.881)}{101.56\ \text{URBAN}} + \underset{(5.107)}{29.221\ \text{FAMRES}}$$

$R^2 = .9546$ Adj. $R^2 = .9422$ $F = 77.103$

(8) $$\underset{(-2.464)}{\text{RICE} = -96.437} + \underset{(4.219)}{0.2363\ \text{INCAP}} + \underset{(5.350)}{35.479\ \text{FAMRES}}$$

$R^2 = .7946$ Adj. $R^2 = .7604$ $F = 23.218$

(9) $\ln(RICE) = 1.1348 + 0.2020 \ln(INCAP) + 1.6302 \ln(FAMRES)$
$(2.090) \quad (3.855) \quad (4.913)$

$R^2 = .8338 \quad \text{Adj. } R^2 = .8061 \quad F = 30.094$

(10) $BEEF = -42.837 + 0.1682\ INCAP + 18.339\ URBAN + 8.5773\ FAMRES$
$(-3.965) \quad (10.853) \quad (5.066) \quad (4.736)$

$R^2 = .9446 \quad \text{Adj. } R^2 = .9295 \quad F = 62.578$

It can be seen that the income elasticity is negative for corn, i.e., corn is an inferior good, and it is positive for the other goods. The income elasticities, evaluated at mean values of variables, are as follows:

CORN	[eq. (6)]:	-0.20
WHEAT	[eq. (7)]:	+0.39
RICE	[eq. (8)]:	+0.18
RICE	[eq. (9)]:	+0.20
BEEF	[eq. (10)]:	+0.51

The family size variable operates in the same direction that income does: ceteris paribus, larger families mean more per capita consumption of rice, wheat and beef, and less of corn. The urbanization variable operates strongly in favor of wheat and beef consumption. Living in a large city, rather than in a rural area, means a person consumes daily 28 grams more of wheat, for the same per capita income and family size. (It means consuming 101.56 more calories in the form of wheat flour, and each gram of wheat flour contains 3.67 calories.)

Urbanization apparently is not important in determining the consumption habits for corn and rice.

In the case of wheat, the role of relative prices in determining demand is explored in Chapter 6. To conclude this chapter, it is worth mentioning a cautionary note on the use of the elasticities presented above. While they appear to describe well the effects of structural changes on consumer demand, they should not be applied directly to projections over time. The evolution of demand over time is affected both by absolute increases in real incomes and by changes in the distribution of incomes, as well as by prices, of course. The income elasticities reported here refer to the change in demand with respect to a change in a family's relative income; that is, its position in the income distribution. They may not apply equally well to absolute changes in average incomes.

Chapter 5

ISSUES IN MARKETING POLICY FOR CONSUMERS

Introduction

As most governments do, the Government of Honduras attempts to protect the interests of consumers through programs that attempt to make food available at reasonable prices, especially for the lower income households. Some of the programs are based on imported donated foods, from the United States and Europe. Those programs distribute food in a variety of ways, including via food-for-work programs, in school lunch programs, and in programs designed to improve maternal and child health.

This chapter is concerned with the economics of the two programs that affect the largest number of consumers: a program of retail price ceilings and a program of direct retail sales. These programs affect consumers directly; the imports and domestic purchases and sales of IHMA (the Honduran Institute for Agricultural Marketing) also affect consumers, but indirectly. Some of the issues concerning IHMA are raised in chapter 2 and analyzed in chapter 6. Here the focus is on the consumer side of food policy interventions.

Retail Price Controls

The Government of Honduras establishes maximum wholesale and retail prices for a variety of foods and other basic goods. This system is administered by the Bureau of Internal Trade in the Ministry of Economy and Trade. All commercial enterprises dealing in the products that are included in the official price list are required to post a copy of the list in a visible place. Penalties for breaking the law consist of fines ranging from 5 lempiras to 10,000 lempiras, and, in the case of repeated offenses, the closing of the establishment.

A total of 63 products were subject to retail price controls at the beginning of 1986. Over one-third of these were food products. Included in this group were cooking oil, baby food, fluid milk, powdered milk, wheat flour, bread and pastas, butter, sugar, eggs and salt. A range of other consumer and industrial products also are under price control. Examples include detergents, toothpaste, pencils, fertilizer, cement, petroleum derivatives and other fuels.

In many countries such systems of price control are justified on grounds of protecting consumers from price speculation. In Honduras, mention also is made of the need to make sure that adequate supplies of basic commodities remain available in domestic markets. These objectives are related, for speculation is most likely to occur in periods of

shortages, and they are laudable. The question is whether a system of wholesale or retail price controls is an effective way of achieving those objectives.

Most economists recommend that countries not try to establish systems of price controls, except under exceptional circumstances such as war. To begin with, such systems are difficult to implement. In most developing countries, for example, governments cannot afford sufficient staff to ensure compliance. Honduras, which has only 35 inspectors to enforce compliance nationwide, is no exception. Under these circumstances, it is not surprising that most informed observers interviewed for this study suggested that enforcement of the current system is not very effective.

An even more difficult problem is the analytic one of determining at what levels the prices should be set. The objective of the price-setting exercise is to find those prices which eliminate excess profits and price speculation without encouraging over- or under-production. A part of the exercise is calculating the cost of production and transformation of the commodities, and that part alone requires a substantial amount of data, including very up-to-date data, and skilled analysts. A number of difficult conceptual problems are involved in these calculations, including the shadow pricing of non-market resources such as family labor and land of varying qualities. Also, costs of production vary widely over farms and firms. In

a sector with many thousands of producers, which often typifies agriculture, an unresolved question is whether to estimate an average cost, a marginal cost, or some other cost. In principle, the marginal cost is the desired one, but costs vary so much in agriculture that adhering rigorously to this principle would lead to very high estimates of production costs for most commodities -- representing the least efficient producers. Utilizing such cost estimates for the controlled prices would lead to excess profits for the more efficient producers and would eliminate incentives for them to reduce their costs further.

Yet other difficulties emerge when the demand side of the analysis is introduced, for estimated demand curves are usually only available for a few commodities, and they have a fairly wide margin of statistical error associated with them. The administered prices should equilibrate demand and supply, and so demand behavior needs to be understood fairly well. Another complication is the role of cross-price effects in both demand and supply. And another one is the role of imports: the market-clearing price very likely will depend on the quantity and price of imports.

Over time, relative prices have to change as productivity improves in an uneven fashion over different products, and as consumer tastes gradually change, owing to urbanization, education and other factors. If relative prices do not change,

then the nation's allocation of economic resources over products may be locked into a pattern which has become inefficient under the new set of supply and demand conditions. For this reason, administered prices have to be altered over time, not only to keep up with the general rate of inflation but also to allow for these allocative forces. All things considered, the analytic problem of setting and revising maximum prices is a very demanding one, and it can be considered beyond the competence of most government staffs to do it on any scale. While the Honduran Government has some very qualified staff members, it can be argued that their talents are much better used in other endeavors.

Errors in determing the appropriate prices have important consequences. When prices are set too low, assuming that compliance is enforced, the supply of goods brought to the market will be too small to satisfy consumer demand at that price -- the reverse of the intended result. As a result, some consumers will be denied the opportunity to purchase the goods, marketing establishments may be encouraged to ration the available supply to their friends and valued customers, and both consumers and suppliers will be encouraged to participate in the parallel or black market. The supply shortages also will tend to become more serious over time, as producers of the controlled commodities shift more of their resources into producing other commodities which are not subject to price controls.

Setting prices above the equilibrium price also can be counter-productive. When there is insufficient competition among the selling firms, for example, these firms may be tempted to set their prices at the maxima even when lower prices would cover their costs and allow for a reasonable return on their investment. This again leads to a situation that the price controls were intended to eliminate. If, on the other hand, sufficient competition does exist in the market, prices will reach their equilibrium level -- below the maxima in this case -- independently of the ceiling prices. In other words, consumers, including low-income consumers, benefit more from competition than from price controls.

Interviews with Honduran experts suggest that the prevailing system of price controls suffers many of these defects. It frequently is irrelevant, and when it is relevant, it tends to encourage informal rationing and/or cases of excess profits or inefficient production. An example of the latter concerns the administered wholesale prices of wheat flour, discussed in the next chapter. From an economic viewpoint, therefore, it can be concluded that the administered prices are not an effective means of achieving their stated goals.

It bears repeating that the Government's concern over the possibility of unexpected and sharp food price increases is a legitimate one, especially so in a country where so many people live in near-subsistence conditions. There do exist

alternative means of addressing this concern. One of the more commonly used ones is the establishment of a regulatory reserve of non-perishable basic foods (corn, beans, wheat, powered milk, vegetable oil, for example), and being prepared to make releases from the reserve when evidence of shortages begins to appear.

Another approach is simply to be ready to make use of the import facility when domestic supplies appear to be insufficient. The main problems with this approach are that it requires forecasting exercises regarding domestic production, and that sometimes the contracting procedures for importing are too lengthy to ensure arrival of the foods in a sufficiently timely fashion. For these reasons, the policy of occasional strategic imports may have to be accompanied by a small regulatory reserve, to be used in exceptional cases to tide the populace over until the imports arrive. Basically, the issue is a question of risk management, and the program of permanent and widespread price controls is a heavy-handed and not particularly effective response to the concern. Over the longer run, policies which encourage growth of domestic food supplies are the best answer.

The Program of Direct Retail Sales

The Government of Honduras also have developed a network of retail stores to sell basic goods directly to consumers.

These stores are owned and operated by BANASUPRO (Suplidora Nacional de Productos Básicos), which is an autonomous agency created in the mid-1970's. BANASUPRO has set up its own wholesale operation to supply these stores, buying domestically produced goods from other wholesalers and imported goods from authorized distributors.

The BANASUPRO stores sell mainly food items. In 1984, for example, 87 percent of the total value of sales was accounted for by food products: rice, corn, sugar, red beans, butter, edible oils, milk, baby food, eggs, chicken, juices, and other foods. Non-food items, however, are growing in importance, accounting for more than half of the 700 products included in BANASUPRO's product line in 1985. These non-food items include a growing number of non-essential items such as cosmetics and a proliferation of sizes and brands of many standard items. In 1985, BANASUPRO was carrying 45 varieties of soap, 26 varieties of deodorant and 49 varieties of liquid, powdered and flavored milk. But its stores do not carry any fresh fruits or vegetables.

BANASUPRO's mandated objectives are to "help regulate the prices of basic food commodities in the country" and to "reduce food prices." That is, its objectives are much the same as those of the price regulation program. The motivating assumption also appears to be the same; that food prices can be reduced by weakening the market power of monopolistic elements

in the food marketing chain. A corollary assumption is that a government-owned network of stores, which does not have to make a positive profit, much less a monopoly profit, can market foods more cheaply than the private sector.

This last assumption now is being called into question by many in Honduras, and, like IHMA, BANASUPRO is undergoing review regarding its basic structure. In this section, some of the issues concerning BANASUPRO are discussed with the aim of contributing some additional perspectives to the on-going debate in Honduras.

The management of BANASUPRO assumes the responsibility for providing basic foods at a price at least somewhat below the lowest price found in the private sector. BANASUPRO uses market surveys for some products to determine systematically what prices private retailers are setting. However, the one review that has been made of prices in BANASUPRO's outlets, in comparison with those in other types of retail outlets, found no significant differences in price by type of store (Paliero, 1985). Also, for the products with officially controlled prices, which are the more basic products, BANASUPRO sets its prices at the official maxima. It therefore could not undersell the private sector in the most important products, if the price controls were effectively administered.

Compared with the private sector, BANASUPRO suffers from a number of disadvantages in regard to the services it provides.

Its outlets are open fewer hours per week; they do not provide credit, as many small private retailers do; they tend to carry a more limited range of items; and they are more often out of stock of items in their inventory. In other words, by and large they are not very competitive with private sector stores, in spite of the fact that their reason for being is to compete effectively.

It is doubtful that BANASUPRO, as it now functions, has much of an impact on the welfare of the poor. The BANASUPRO stores are not concentrated in poor residential areas, and they do not provide the poor with more services than the private retailers do. In fact, they provide less, as noted. In the new instances in which BANASUPRO stores offer a price advantage, their irregular inventories negate much of that benefit.

In addition to these problems, BANASUPRO stores tend to be overstaffed with respect to their volume of business, and this has contributed to continuing financial problems. The financial problems of BANASUPRO have received considerable attention in recent years, but in fact they are symptoms of some more basic problems stemming from the assumptions underlying its creation and the way in which it is operated.

The total value of BANASUPRO's goods and services has been running around 35 million lempiras per year in recent years. BANASUPRO's operating costs, on the other hand, have exceeded

the value of sales in most years, with yearly operating deficits of about 1 to 2 million lempiras. However, since they have occurred almost every year since BANASUPRO was created, they have been slowly undermining the financial viability of the organization.

The deficits have had fewer negative effects on BANASUPRO's operations than might have been expected, owing to the presence of additional financing from outside sources and a capital account against which the deficits could be charged. In the early 1980's, for example, BANASUPRO received approximately 13.2 million lempiras worth of butter oil and powdered milk from the European Community (EC), and it sold these commodities through its stores to help offset the deficit. The EC also donated capital equipment worth over a million lempiras to assist BANASUPRO in opening food stores in 75 new locations and to implement a program for marketing fresh fish. This source of funding is no longer available, however. But the EC still uses BANASUPRO as a vehicle for distributing its donated commodities and pays the agency a fee for these services. These proceeds are now deposited in a special fund set up to finance various development projects.

While BANASUPRO has had the option of charging its operating deficits against a capital account, rather than having to ask the Government for a line item subsidy, that option is not likely to be available much longer. The use of

that capital account over the years has reduced it from an initial value of 17 million lempiras to 5 million lempiras in 1985.

Thus, the financial exigencies are forcing a review of BANASUPRO. In recent years, the agency's management has responded to the evolving situation by making a number of changes which were expected to reduce costs. These include reducing the total number of stores in the system, increasing the number of stores operated by concessionaires, rather than by BANASUPRO staff, and relocating some of the stores to increase their catchment population. By January of 1986, BANASUPRO had reduced the number of retail stores in its network of 98, of which 65 were operated directly by BANASUPRO, 30 of which were operated by concessionaires, and 3 of which were mobile units. Staff numbers also were reduced.

BANASUPRO's financial problems appear to be continuing, however, necessitating further changes in its operations and perhaps even in the basic structure of the organization. A number of changes have been suggested in the several reviews of BANASUPRO that have been prepared by consultants working for USAID, the World Bank, the FAO and the EC. The suggestions include continuing the trend of putting the stores in the hands of concessionaires, adding more nonessential but high-margin items to BANASUPRO's inventory of goods, and beginning to price items on the basis of actual cost.

Most of the changes recommended are designed to reduce operating costs or increase the agency's income. However, another question needs to be addressed, and that is whether the agency is fulfilling its original mandate, and whether the proposed changes will help it move in that direction more effectively. Its objectives are focused on providing economic assistance to lower income groups through increasing the purchasing power of their food budgets. "Providing the urban and rural poor with an efficient retail distribution system," "increasing their purchasing power," and "improving their nutrition," are some of the explicit objectives as well as the ones cited previously concerning lowering food prices. In light of the analysis of the previous chapter, which shows a deterioriation in average Honduran diets and diets of the poor that are already inadequate, the objectives focussed on the poor are important.

It was pointed out previously that there are reasons to doubt that BANASUPRO has been meeting these objectives in a systematic way. Would the proposed changes help it fulfill its objectives? That is doubtful as well. For example, increasing the number of concessionaires probably would lead to more stores in middle class neighborhoods. Those stores tend to have higher profit margins than do the stores in lower-income neighborhoods, and therefore they are more likely to be attactive to concessionaires. Similarly, selling more

nonessential but high-margin items would make the most sense in neighborhoods that are better off, where customers are more likely to have the income to purchase them. Certainly the nonessential items do not contribute to meeting the basic needs of the poor.

In other words, implementing some of the more frequently mentioned recommendations is likely to move BANASUPRO more upscale; that is, into areas and product lines in which it would be competing more with supermarkets and other modern retail outlets in middle class neighborhoods. Other than to reduce BANASUPRO's operating deficits, there is little to be gained, from a public policy viewpoint, by encouraging BANASUPRO to move further in this direction. In the end, government-owned stores will be hard pressed to compete effectively against the more modern private merchants. In any event, the middle class is not the target group for policies aimed at poverty alleviation and better nutrition, and more competition is likely to exist in this segment of the market than in the segment patronized by the poor.

Alternative approaches to fulfilling BANASUPRO's objectives do exist. If the consensus in the Government is that a basic aim is to stimulate competition in retail marketing, then BANASUPRO stores are needed only where competition among private sector retail stores in lacking. Proof of unfair pricing practices should be the major criterion

considered when opening new outlets, not the size of catchment populations or other measures of potential profitability. And BANASUPRO stores, when and where they are needed, should be competitive in non-price services as well as priced products.

Even in areas where local monopoly can be substantiated, other, less costly, alternatives may exist. Measures could be taken to encourage additional private retail outlets to locate in those areas, for example, or assistance could be given to the formation of consumer cooperatives. BANASUPRO's role in these kinds of programs could be indirect, supplying the new outlets with some of their stock until they secure agreements with alternative suppliers, for example, or providing them with interim financing and technical assistance. There is no guarantee, of course, that BANASUPRO would be self-supporting financially in this role. But if the programs were effective, then the subsidization of the associated deficits could be justified, unlike the present ones, as a legitimate cost of achieving an important objective of public policy.

Another very different option that is deserving of serious consideration by the Government is to use BANASUPRO as a basis for a food subsidy program targeted for the poor. Doing so would entail making major changes in both its structure and operating procedures.

This option could be carried out in a variety of ways. Evidence now available from research in a number of countries

indicates that food subsity programs can be cost-effective ways to improve the diets of the poor if they are effectively targeted (Musgrove, 1986). Appropriate targeting, however, is easier said than done. Two of the programs most easily implemented are commodity-based and geographically based targeting. An implication for BANASUPRO is that it should limit the number of products it handles to a few basic food commodities of demonstrated importance to poor households. To increase the likelihood that these commodities reach the poor, they also should be sold where the poor shop, that is, through retail outlets located in poor neighborhoods. These stores would not have to be owned or operated by BANASUPRO; in fact, the program is more likely to be cost-effective if they are not. BANASUPRO's management could take steps to ensure that the subsidy they are providing is in fact passed on to the customers in each of its participating stores. Under this scenario, BANASUPRO would become primarily a wholesaler of basic commodities, providing them at subsidized prices, along with technical assistance, to small-scale retailers in poor neighborhoods. The role has been adopted recently for some of the operations of CONASUPO in Mexico.

This re-orientation would constitute a major change for BANASUPRO. A first step would be to establish the informational basis for the new programs, starting with a small survey to find out where the urban poor buy their food and why.

The findings of such a survey in Bogotá showed that the practice of buying in small quantities cost the poor more than spatial price variations did. Therefore that survey highlighted the need for self-help programs, such as credit unions, to assist in bulk purchases. Also, there is a need for a careful survey, at frequent intervals, of retail food prices within the major urban areas, to be able to evaluate the hypothesis which underlies the present programs that high prices are associated with particular retailers or particular selling practices. Finally, as mentioned earlier in this chapter, it is important to attempt to find out why investments have not take place in more modern marketing technologies, and to develop programs to encourage such investments.

Chapter 6

PRICES AND PRICING POLICY

Introduction: Honduran Agricultural Prices in International Perspective

This chapter reviews a number of aspects of Honduran agricultural prices and the associated policy questions. It begins with a brief review of Honduran prices vis-a-vis international prices, that is, with respect to the question of rates of protection. Next, the internal terms of trade, or trends in agricultural versus nonagricultural prices, are taken up, followed by a more detailed analysis of the role of the price assigned to imported wheat. Then the role of the Honduran Agricultural Marketing Institute (IHMA) is discussed, along with a statistical analysis of the effects of IHMA policies on prevailing domestic price levels for basic grains. In this last discussion, some more general points on domestic pricing policies are raised. Questions of the incidence of pricing policy are deferred until the following chapter.

Compared to the situation of many other countries in Latin America, Honduran agriculture is not characterized by many price distortions. Only in four of the principal products do domestic prices differ significantly from their border price equivalents. Other kinds of pricing issues arise with respect to imported wheat and also with respect to the activities of IHMA, but protection, or lack of it, is not the issue that it

is in, for example, the Dominican Republic, Panama, Peru and, prior to 1983, Mexico.

A comparison of Honduran prices with prices in other Central American countries is given in table 42. As the table shows, the Honduran price of corn has been similar to, or slightly below, its average price in the other countries. The sorghum price has not differed markedly from the regional average either. But the Honduran bean price generally has been quite a bit below the regional average, and the rice price above it. These price comparisons refer to the rural wholesale prices, but they confirm conclusions drawn from a review of farm gate prices: that Honduras has protected its rice producers somewhat and has (implicitly) taxed its bean producers. These tendencies in policy may be contributing factors to the trends noted previously toward higher rice production and lower bean production.

Recently the World Bank has conducted a careful analysis of the corn and rice prices, taking into account the necessary adjustments for marketing and processing margins, for both domestic and imported products. The finding of that analysis is consistent with the above finding: that there has been, over the 1983-85 period, a slightly negative rate of nominal protection on average (about -8 percent) for corn, and a more strongly positive average rate of nominal protection (about +20 percent) for rice. Beans were not included in that analysis.

The other two products that appear to have prices significantly different from their border equivalents are milk and sugar. The milk price at the producer level has been held below its border equivalent, presumably with the aim of promoting consumer welfare, and the sugar producing sector has been highly subsidized since 1982. The policy on milk has had the side effect of encouraging the growth of milk imports, which have grown much more rapidly than domestic production (table 29).

The sugar price (50 lempiras per hundredweight, wholesale, refined white sugar, as of 1985) is more than twice its border equivalent, allowing for adjustments for marketing margins. Imports of sugar are prohibited, although there is some smuggling of sugar into the country. One of the motives, perhaps the principal one, for the sugar price policy has been to sustain the operations of four new sugar mills that were constructed toward the end of the 1970s. The rapid increase in sugar consumption per capita that was noted in chapter 4 is due mostly to the increase in supply capacity, but consumers have paid dearly for that increased domestic supply.

Thus, in all four cases in which domestic prices appear to be noticeably distorted from their international equivalents (rice, beans, milk and sugar) those price distortions apparently have influenced domestic supply trends. The net nutritional effect is a diminution of domestic protein supplies

per capita, via declines in bean and milk supplies per capita that are not compensated, in protein content, by the increases in rice and sugar production. In the case of milk, imports of dry milk, however, have compensated for the increasing scarcity of domestic supplies. Nevertheless, taking all four products together, the total net effect, including imports, is still a decline in protein availability per capita (table 34).

The attempts to increase the availability of those foods to Honduran consumers have involved either an increasing dependence on imports (milk) or a fiscal loss (the subsidy to sugar and the fiscal loss of IHMA in rice marketing). In addition, these price distortions have diminished economic efficiency in the sector, by diverting resources into sugar and rice, at the margin, and out of beans, milk and, to a lesser extent, corn. In this case, the diverted resources refer not so much to land as to labor and fiscal funds, although land use patterns could have been somewhat different under a less distortive pricing policy in these products.

The Domestic Terms of Trade

A fundamental aspect of the trend in the domestic terms of trade was pointed out in chapter 1, that is, that the agricultural price index has declined relative to the nonagricultural price index (as measured by the sectoral GDP deflators), since 1970. Within that period there have been two

sub-periods with divergent patterns of price movements. From 1970 to 1978, agricultural prices increased more rapidly than their nonagricultural counterparts, and since 1978 agricultural prices have increased much less rapidly (table 4).

The sectoral GDP deflators measure the value over time of a "unit of value added," but that concept is difficult to interpret because it includes a mixture of wages and returns to capital. Alternatively, it measures the price index of all final goods produced in the sector, including export goods and capital goods, but excluding intermediates. This second interpretation is clear, but unfortunately it means that the index excludes many of the most important agricultural goods, such as corn, rice, and beef, because they are not generally sold directly to consumers in raw form, but rather they are processed first. Therefore, they are sold to the food processing industry, and in economic accounts they are considered to be intermediate goods.

A more comprehensive measure of prices at the sectoral level would be given by a producer price index, but that index does not exist in Honduras. Under the circumstances, the agricultural and nonagricultural components of the wholesale price index might be used to make comparisons, but that index was not initiated until 1978. Therefore, to facilitate further examination of the movements in the intersectoral terms of trade, an agricultural consumer price index has been

constructed. It can be compared with the overall consumer price index, although the latter of course includes agricultural goods also.

The constructed agricultural consumer price index, which has 1978 quantity weights (from the apparent consumption series), is based on the 14 most important products from the viewpoint of the consumers' budgets: corn, beans, wheat, rice, beef, dairy products, poultry, eggs, pork, bananas, plantains, potatoes, cassava, and tomatoes. The series on ths consumer price of wheat is available only from 1975, so two versions of the index were constructed: without wheat, from 1970, and with wheat, from 1975. Table 43 shows these indexes and the overall consumer price index as well.

A picture of price trends at the consumer level emerges from table 43. As before, agricultural prices rose more rapidly than nonagricultural prices from 1970 through 1978, and subsequently the reverse was true. However, in the case of the consumer prices, the trends in the two periods offset each other so that by 1985 the terms of trade were lower from agriculture's view point than they were in 1970.
In recent years nonfood prices have risen much more rapidly than food prices.

At the farmgate level, agricultural prices have dropped relative to both food and nonfood consumer prices. As was discussed in chapter 1, the purchasing power of farm incomes has declined, specially since 1978, so in that regard farmgate prices have not been keeping up with other prices in the economy. There does not exist a producer price index for all goods in the economy, so farmgate prices cannot be compared directly with the corresponding ex-factory prices of industrial goods. Nevertheless, in the following section it is shown that most farmgate prices have declined relative to consumer prices, even relative to consumer prices of foods.

This last finding suggests that marketing margins have increased over time in proportionate terms (see below). That phenomenon has been noted in other countries. It is to be expected in view of the fact that the principal input to marketing activities is labor, and wage rates have increased relative to other prices in the economy, as indeed they should if economic development is to occur.

Trends in Product Prices at the Consumer Level

Consumer prices of some major foods are shown in table 44, and they are deflated by the overall consumer price index in table 45. This deflation procedure expressed real food prices in terms of the weighted-average price of all consumer goods. It is evident from table 45 that the real price of corn has

dropped substantially in recent years. This trend is consistent with the earlier observation that slightly negative protection on corn that now prevails, on average. The role of IHMA in reducing the consumer price of corn is explored later in this chapter. Table 45 also shows a substantial increase in the domestic real price of bananas, which is consistent with the increasing scarcity of that food (table 32), in the absence of IHMA-like operations on the banana market. In general, the table confirms the difference in food price behavior between the two periods 1970-78 and 1978-84.

One of the clearest trends in tables 44 and 45 is the decline in the consumer price of wheat flour, relative to the price of other principal foods. This trend is brought out more clearly in table 46. Over the 1975-85 period, the wheat price dropped substantially with respect to every other staple product price except that of corn. This behavior suggests that price may have played a role in increasing wheat in the average Honduran diet. To test this hypothesis, wheat demand functions were fitted to the aggregate time series for the 1975-85 period. The regressions also constitute a test of the hypothesis that wheat import levels have, in fact, responded approximately to the growing demand, and have not been determined arbitrarily or only by other criteria, such as the need for budget support via PL 480 imports.

The variables used in the regression were the per capita consumption of wheat (WHECON), per capita real GDP (YCAP), and

the real price of wheat from table 44 (RPRICE). An urbanization variable also was tested, in the form of the urban share of the population, following the cross-section results in section 4.5. The cross-section of course does not have price variation, so in chapter 4 it was not possible to investigate price responsiveness.

Both linear and log forms were regressed. The equation with the best statistical properties is the following:

$$(1) \quad \log(\text{WHECON}) = \underset{}{2.1363} + \underset{(0.827)}{0.6836} \log(\text{YCAP}) - \underset{(-4.339)}{0.6494} \log(\text{RPRICE})$$

$$R^2 = .7530 \qquad \text{Adj. } R^2 = .6912 \qquad F = 12.19$$

The income elasticity here is higher than the one resulting from equation (7) in chapter 4. Both the income and the price elasticity are statistically significant by normal standards, the latter especially so considering that the sample contains only eleven observations. The t-value for the income coefficient and the F value can be improved by suppressing the constant term, but theory indicates that the constant needs to be included, if nothing else to translate units. The magnitudes of the elasticities are in the acceptable range *a priori*, as wheat is a preferred food.

Inclusion of the urbanization variable did not lead to satisfactory results, as it happens to have a strong negative

correlation with the real price variable. When it is present in the equation, the F value is lower and the price coefficient becomes statistically insignificant.

An implication of equation (1) is that the domestic price setting policy for wheat flour has a definite influence on the demand for wheat and therefore on the import levels of wheat. Since the real price of wheat declined by about one-third over the 1975-85 period, and the price elasticity is -0.65, equation (1) suggests that wheat imports would have been about 22 percent lower in 1985 if wheat's domestic price had been maintained constant in real terms at the 1975 level. Of course, wheat prices have declined on international markets, so maintaining a constant real domestic price would have required the imposition of an implicit tariff, at an increasing ad valorem rate over time.

To speculate a bit further, such a policy probably would have increased the domestic demand for other grains and perhaps also for root crops. Hence, domestic corn prices, at least, would have been slightly higher. The corn protection rate then might not have been negative; it probably would have been closer to zero. The distributional effects of an implicit tax on wheat would be progessive; that is, it would have been borne more by consumers with higher incomes, given the manner in which wheat consumption habits vary by income group (tables 37-39).

Another issue that arises with regard to wheat is the way in which prices are administered at the mill level. In practice, the ex-mill price of wheat flour is set at different levels in different mills, for the same quality of flour. These differentials are said to reflect variations in the cost of milling. But in economic terms, the effect of the policy is to reward inefficiency in milling. A uniform price across mills would encourage improvements in milling efficiency in those mills that currently are more costly to operate. Thus, both the average domestic price of wheat and its variations over mills emerge as issues worthy of attention by policymakers.

Producer Prices

Producer prices for 25 proucts for the 1970-83 period, are reported in table 47. In table 48 those prices are deflated by the GDP deflator. It would have been preferable to deflate by an economywide producer price index, or even a wholesale price index; but, as noted, the available data do not permit that. The general trend is toward declining real producer prices. Of the 25 products, only 3 (bananas, cotton, and palm oil) registered an increase in the deflated producer price over the 1970/72 - 1981/82 period. (If the deflation had been carried out with the wholesale price index, starting from 1978, the result would have been an even stronger tendency toward declining real producer prices.)

This trend is, of course, consistent with the findings of chapter 1 regarding the movements in the intersectoral terms of trade. The causes of the decline vary by crop. For some (cassava, pork, sorghum, potatoes), falling per capita domestic demand, because of taste shifts and lower per capita total real consumption, appears to be the cause. For others (tomatoes, pineapple), increases in supply, in relation to demand, appear to have been important. For coffee, tobacco, cotton, and coconuts, international price movements have been the main factor. And for sugarcane and milk, the policies on prices administered domestically have been the dominant influence.

Nevertheless, the overall trend in real producer prices is consistent enough to ask whether there may have existed some common explanatory factor for all products. It has been suggested that the Honduran lempira became overvalued during this period. If that were true, then it would have explained at least part of the general decline in real producer prices, since agriculture is the most highly tradeable sector on the whole. Recent studies by Norton and Schuh have shown that for Colombia and Brazil the exchange rate indeed affects the domestic terms of trade among sectors.

It is beyond the scope of this study to investigate exchange rate policy, but it can be pointed out that there are two indications that perhaps the lempira was slightly overvalued by the early 1980's. First, the lempira-dollar

exchange rate has remained fixed for a very long time, and yet over the 1970-81 period, the Honduran GDP deflator increased by 14 percentage points more than the United States' GDP deflator did, and the U.S. is Honduras' major trading partner. Second, until about 1984, the dollar was overvalued with respect to the currency of other major industrial nations of the world. That factor would have contributed to an overvaluation of the lempira against a market basket of currencies, independently of the lempira-dollar relationship. Third, the Central Bank of Honduras considers (as of 1987) the lempira to be overvalued by 15 - 20%. The topic clearly warrants further research, but it does appear that there is prima facie evidence that exchange rate policy contributed to the deterioration of the domestic agricultural terms of trade, at least up until recently.

Another aspect of policy that is revealed by tables 47 and 48 concerns the transmission of international price instability. It is evident that sugar has been treated quite differently than other traditional exports in this regard. Domestic prices of coffee, cotton and tobacco have been allowed to fluctuate more or less in line with world market fluctuations, but that has not been the case for sugar, especially, as noted, since 1982, but also in the early 1970s. The consequence is a strongly subsidized sugar sector under current world market conditions, and a large part of the subsidy is paid by consumers through a high price for sugar.

Domestic corn and sorghum prices also have been held more stable than their international counterparts.

Marketing Margins over Time

Overall, it may be concluded from the foregoing that since 1970 the prices of food and other agricultural products in Honduras have behaved in such a way as to affect negatively both nutrition levels and real producer incomes. For the consumer, food prices have risen relative to nonfood prices, and for the producer, farmgate prices have declined relative to other price indexes in the economy.

Another way of viewing this issue is to examine the trends over time in the ratio of consumer producer prices, on a product basis. Since 1970, that ratio has increased substantially for most products, indicating that marketing margins have increased in proportional terms. Table 49 shows these ratios for 13 products. Of those products, only two showed a decrease in the consumer-producer price ratio, when 1970-73 values are compared to 1980-83 values. In some cases (rice, beef, tomatoes, cabbage), the increase in the ratio was very substantial, exceeding 70 percent in the case of tomatoes.

This last finding suggest that by and large productivity imporvements are not occurring in the marketing area. Also, in some cases the increase in the marketing margin is more than can be explained by the increases in real wages. The

intervention of IHMA (corn, beans, rice) and the imposirion of price controls (milk) have not prevented this phenomenon from taking place.

The Role of IHMA

In recent years, IHMA has become a major source of concern with regard to public policy, in view of its deficits and the loss of commodity support from the EEC, which formerly helped offset some of the deficits. (See chapter 2.) In order to provide additional information for the discussion about IHMA, some regressions have been fitted in order to evaluate the effectiveness of the institution's actions in determining prices.

Hypotheses were tested regarding the determinants of product prices at the wholesale level, as these prices appear to be more reliably compiled than the farmgate prices cited above. In the absence of IHMA interventions, the principal variables influencing price are assumed to be the production level (with a negative sign) and, in some cases, the amount of foreign trade in the product. In principle, IHMA can influence the price both by varying its announced purchase price and by varying the volume of its purchases. For statistical purposes, the volume variable was expressed as the IHMA share of marketed output. The main question is whether the announced purchase price or the volume of operations has a statistically significant coefficient in the price equation.

The wholesale price is the annual average price. For corn 19 annual observations, 1966-84, were used. The results were as follows where the wholesale price is PCORN; the guaranteed farmgate price GPCORN; the volume of IHMA purchases, as a share of total marketed output, VCORN; the production of corn, XCORN, and the imports of corn, as a share of total marketed output, MCORN:

$$(2) \quad PCORN = 3.616 - \underset{(-1.943)}{0.540}\ XCORN$$

$$R^2 = .1817 \qquad F = 3.774$$

This basic equation has a low goodness of fit, but it confirms that price responds in the expected way to variations in production. The coefficient of production is significant at the 93 percent confidence level.

$$(3) \quad PCORN = 11.569 - \underset{(-1.803)}{0.485}\ XCORN - \underset{(-0.061)}{0.017}\ GPCORN - \underset{(-1.761)}{2.216}\ VCORN$$

$$R^2 = .3466 \qquad \text{Adj. } R^2 = .2160 \qquad F = 2.653$$

Equation (3) reveals that the volume of purchases is much more signficant than the guaranteed price. Variations in the latter have no discernible effect on market prices. This equation also indicates that the volume of purchases affects market prices inversely: the greater the IHMA purchases, the lower the resulting market price. This outcome occurs because IHMA sells as well as buys, and apparently the net effect of the IHMA

subsidy for corn is in favor of consumers rather than producers. In other words, its actions do not elevate the farmgate price at harvest time, but they do lower the average price faced by consumers over the year.

The next equation does not contain the insignificant variable representing the guaranteed price:

$$(4) \quad PCORN = 11.663 - \underset{(-1.871)}{0.482}\ XCORN - \underset{(-2.009)}{2.247}\ VCORN$$

$$R^2 = .3465 \qquad \text{Adj. } R^2 = .2648 \qquad F = 4.241$$

Here the VCORN coefficient is significant at the 94 percent confidence level.

Introduction of the variable for imports of corn, as a share of marketed output, resulted in a coefficient with the correct sign, but it was somewhat less significant (at the 90 percent confidence level):

$$(5) \quad PCORN = 13.430 - \underset{(-1.657)}{0.420}\ XCORN - \underset{(-1.643)}{2.090}\ VCORN - \underset{(-1.105)}{0.990}\ MCORN$$

$$R^2 = .4800 \qquad \text{Adj. } R^2 = .3400 \qquad F = 3.362$$

Equation (5) overall is less reliable statistically than equation (4), but it does show that imports put downward pressure on prices. Another experiment, introducing GPCORN into equation (5), again failed to yield a signficant coefficient for that variable.

For sorghum, the basic equation is as follows:

(6) $PSORG = -2.260 - 0.410\ XSORG$
(-2.693)

$R^2 = .5900 \qquad F = 7.252$

Here the basic market relationship is stronger than it is in the case of corn, perhaps because IHMA interventions are less effective in the case of sorghum. The guaranteed price variable for sorghum had a completely insignificant coefficient, and the volume variable was signficiant only at the 62 percent confidence level. Again, the negative sign prevailed for the volume variable.

In the case of rice, the guaranteed price variable was more significant than the volume of purchase variable, but the statistical quality of the overall equation was poorer than that of the preceeding equations. Rice production alone had almost no effect on price.

For beans, the equations generally were better statistically than for rice, and the same pattern resulted as in the corn equations: an insignificant guaranteed price variable, but a significant volume variable, with a negative sign. So again consumers have been the net beneficiaries of IHMA operations, for the guaranteed price has not influenced the farmgate price significantly, on average, but yet variations in the volume of IHMA's bean operations have led to lower bean prices for consumers.

These results suggest that, on the whole, IHMA's price setting operations have tended to follow the "natural" market

trend and have not influenced those trends. The amount of purchase, however, has influenced the market price somewhat, in the direction of lower consumer prices. The one exception to this statement concerns the guaranteed price for rice; rice farmers are fewer in number and are more highly commercial, and there is a consensus that they are more likely to receive the actual guaranteed price than corn farmers are.

On the whole, these results tend to cast doubt on the raison d'etre of IHMA. Apart from the statistical analysis, it may be asked why IHMA has chosen to intervene in sorghum markets. It is not as large a crop as the other staples, and it is not as crucial to nutrition. In any case, the minority of farm households that consume sorghum do so from home retentions.

Chapter 7

THE INCIDENCE OF PRICING POLICY

Introduction

Chapters 4 and 5 discussed estimates of nutrition levels and consumption patterns, along with the existing programs that are designed to support consumption levels. Chapter 6 then reviewed the behavior of prices and pricing policy. In this chapter some calculations are made regarding the effects of variations in pricing policy on consumption patterns and on farm incomes as well.

As noted in chapter 6, pricing policy does not only mean, or necessarily mean, the programs of food purchases and sales by agencies like IHMA and BANASUPRO. Policies on trade, tariffs, and the exchange rate also have significant influence on food prices, at both the farm level and the consumer level. All together, these policy instruments determine the protection levels for agriculture. Thus, in one sense the analysis of this chapter may be viewed as an estimate of the distributional consequences of varying the rate of protection afforded to the sector. One of the tables below, for example, provides estimates of the effects on income, by farm size group, of a devaluation accompanied by moderate wage restraint.

The price effects on incomes and on the cost of food are calculated by static share analysis, using data on consumption budget shares (by income stratum) and also on the share of

income by source. These calculations do not take into account consumer and producer responsiveness, in terms of demand and supply elasticities. After the calculations are presented and discussed, some comments are made on how the inclusion of responsiveness would affect the outcomes; it is found that the qualitative conclusions are not altered by their introduction. The cross-sectional data used in this chapter are a decade old, nevertheless they may be useful in two respects. First, the structural composition of farm incomes and consumption patterns changes only very slowly over time, and so these results may be only approximately relevant to policymaking today. Second, the analysis also constitutes a demonstration of procedures, and those procedures may be applied to more recent data when they become available. One implication of the research reported in this chapter is that agricultural censuses and household surveys can be very useful for policy analysis, and in the case of Honduras, it it unfortunate that there is such a long time lapse between census and other data collection efforts. (Analyses somewhat similar to this one are found in Sahn, 1985, for Sri Lanka; and Meyers, Teklu and Johnson, 1986, for Indonesia.)

In the analysis, a distinction is made between changes in household income and changes in household welfare. If income increases but the cost of the family's consumption bundle increases by even more, then there is a net welfare loss. It

is recognized that the true measure of consumer welfare, on the basis of utility theory, is the compensating (or equivalent) variation, and that consumer surplus often is used as an approximation to this measure. The data used here, plus available estimates of demand elasticities, would permit calculation of consumer surplus; but in this context we have opted for the more tangible welfare measure of change in income less the change in consumption costs. The methodological issue is discussed again below.

As regards the effects of prices on incomes, one of the findings of this chapter is that pricing policy for basic crops is slightly regressive with respect to the stratification of agricultural income by farm size. And it is markedly regressive with respect to total rural household income. This difference in regressivity occurs because total rural income includes off-farm income, and poorer farmers have to earn a larger share of their income from off-farm work. Therefore an increase in agricultural prices tends to benefit larger farms proportionately more because a higher share of their income derives from agricultural production. (To arrive at these and other conclusions, this study has used several sources of statistical information, including an earlier study by Inversiones y Estudios Económicos that was not widely circulated but contains useful information on the composition of farm household income.)

The corn price alone is progressive with respect to agricultural incomes, as is the bean price, but both are more or less neutral with respect to total farm household incomes.

Another principal finding is that raising the corn price has a negative effect on the welfare of families living on the smallest farms (0-2 hectares). This result occurs because their corn consumption exceeds their corn production, and they buy it at a higher price than they sell it. Farms in this size class constitute about 37 percent of all farms in the country. It is obvious that higher corn prices have negative effects on the welfare of urban households, but the finding that it also has negative effects on a significant share of rural household raises important questions about the use of pricing policy to improve incentives to producers. The small farms are so dispersed geographically that it is difficult to reach them with programs of targeted consumption subsidies. And the magnitude of the task is increased by the fact that there also are many landless rural families, for whom the effects of higher corn prices would be even more strongly negative.

Static Income Effects of Agricultural Pricing Policy

A static analysis of the effects of prices on the incomes of agricultural households begins with a disaggregation of agricultural income by source. Chapter 3 presented information on cropping patterns by farm size class, and those data have

been combined with data on yields by farm size to obtain crop production by farm size class. Although these production estimates are based on information from the 1974 census, 1975 prices have been applied. The structure of production would not have changed significantly from 1974 to 1975, and the information on off-farm incomes refers to 1975.

Table 50 summarizes the information on sources of income by farm size class. One of the most notable facts in table 50 is that off-farm earnings account for 52 percent of the income on the smallest farms, a proportion that fails steadily until it reaches 18 percent farms on 10 to 20 hectares. (Unfortunately, the survey did not cover farms larger than 20 hectares.) Corn accounts for only 13.6 percent of the total income on the smallest farms, including the value of home retentions; but it represents 28 percent of agricultural income on those farms. On the whole, the image that small farmers grow only corn and beans is a distortion of reality, for those two crops account for only 16 percent of the average small farmer's income. Other crops, livestock, and forestry, taken together, are much more important, accounting for 32 percent of the small farm's total income. (Incomes reported in the table are net of purchased inputs.) One implication of these figures is that programs to improve the earning capacity of small farms should not be limited to corn and beans.

As might be expected, livestock plays a steadily increasing role as farm size increases (as noted in the

discussion of land use in chapter 3). The same is true of coffee. Forestry activities fluctuate in importance as farm size increases.

Consistent with the findings on efficiency of land use in chapter 3, the smallest farms are easily the most productive per hectare of land. By the time the farm size reaches 10-20 hectares, net income per hectare has fallen to one-third of its level on the smallest farms. This result gives further support to the possibility of a land tax, preferably one that is progressive with respect to farm size, in order to encourage greater efficiency in land use. A progressive land tax also would help make land markets into an instrument of land redistribution, instead of having to rely on governmental agrarian reform programs for that purpose.

Table 51 shows calculations of the short-run effects on incomes of a ten percent increase in the prices of agricultural products. The table's results can be interpreted to apply to either a simultaneous increase in prices of all agricultural outputs or to increases for individual crops or crop groups. In the latter case, the procedure is simply to review only one row at a time in the table. The table shows the approximate increase in income, in lempiras, for each product and farm size, and then the ratios of those increases to total agricultural income and to total income of all types. Total agricultural income (net) is defined to include both livestock and forestry.

In general, a 10 percent increase in all crop prices would increase total net agricultural income by about 10 percent, regardless of farm size. However, it would have a proportionately greater effect on total household income (including off-farm income) for the larger farms, hence the overall regressivity of pricing policy with respect to farm incomes. As noted, maize, beans, and sorghum are exceptions to that regressivity. Sorghum is a significant food in the diet and production pattern of the very poor in some areas, especially in the southern region.

When prices of livestock and forestry products are taken into account also, then the regressivity of agricultural price changes becomes even more apparent, as shown in the last line of table 51. To view these results in terms of policy instruments, simultaneous change in all agricultural prices would tend to occur, for example, with a devaluation because agriculture is a highly tradeable sector. Many agricultural goods are traded directly, and those that are not traded often are partial or full substitutes, in consumption and/or production, for goods that are traded.

If supply response effects were taken into account here, a positive supply elasticity would of course increase the increment in income that results from a price change. It also would tend to increase the regressivity of price effects, since the larger, more commercial farmers tend to have greater supply responsiveness.

Since supply response effects are not taken into account, it may be noted that the results in table 51 would apply equally to a 10 percent increase in agricultural yields or to a 10 percent increase in area cultivated (provided that the increase in area for one crop does not come at the expense of another crop). From the viewpoint of yields, it can be seen that technological improvements that are uniform across all farm size groups also tend to have regressive effects on the distribution of farm income, except in the cases of corn, beans, and sorghum. However, in spite of these distributional effects, price and yield increases bring positive benefits to all farm groups in absolute terms.

Table 7.3 shows the effects only of a wage increase. Wage rates would not be likely to rise independently of price changes, but for purposes of understanding the effects it is helpful to present them separately. Unlike the case of price and yield changes, the net effects of wage increases are negative for farmers in some farm size groups. The farmers in the first two farm size groups do not hire labor, but those in the other three do. Hence, for the families on larger farms, the positive wage effects on off-farm employment are offset, to varying degrees, by the higher cost of cultivation on their own farms. This offsetting effect becomes so strong that the largest farms studied have a net gain of only 4 lempiras per year from a 10 percent wage increase, versus a gain of 47

lempiras on the smallest farms (and versus a gain of 301 lempiras for the largest farms under the scenario on price increases alone).

The distributional effects of wage changes are strongly positive. However, in table 52 substitution effects again are ignored. Specifically, it ignores the loss of employment (capital-labor substitution) that would occur if wages were to increase relative to other prices in the economy. Hence, table 52 is best interpreted in one of the following two ways: (1) as showing the wage effects of a simultaneous increase in wages and prices, or (2) as showing the effects of a wage change that is accompanied by an increase of equal proportion in labor productivity. Viewed in this light, the table shows the importance to small-farm families of finding more productive off-farm employment opportunities.

There is an interesting subsidiary theme in the tables regarding the farm size groups. The farmers in the middle group surveyed (3-5 hectares) are caught in a kind of economic squeeze. Their farms are large enough that they are beginning to hire labor, and also they use proportionately more purchased inputs than smaller farms do. But, their increase in revenue is only slightly greater than their increase in costs. As a consequence, when the average farm size increases from 2.43 hectares (average of the group with 2-3 hectares) to 3.96 hectares (average of the group with 3-5 hectares), the increase

in annual net income is only from L.1198 to L.1342. An increase in area cultivated of 62 percent yields an increase of only 12 percent in net income. Another sign of the pressure on the farmer of 3-5 hectares is that he has less time for off-farm work than either his immediately smaller counterpart (with 2-3 hectares) or his immediately larger counterpart (with 6-10 hectares). It appears clear that the farm size of about 5 hectares is a kind of threshold for takeoff into successful commercial farming. When farm size increases from 3-5 hectares to 5-10 hectares the average area cultivated increases by 80 percent and the average net farm income by 61 percent.

Table 53 combines the foregoing information in a hypothetical scenario regarding devaluation. The scenario could as well represent any other policy change that affects prices of agricultural products uniformly. The use of this scenario does not imply a recommendation for a devaluation. (The scenario uses additional information not shown in the tables regarding amounts of purchased inputs by agricultural activity and by farm size group.) The scenario consists of a 10 percent increase in prices of outputs and material inputs, plus a 5 percent increase in wages. Some degree of wage restrained is required if the devaluation is to be effective in real terms; the degree of restraint chosen here is only illustrative.

Assuming that agricultural output and input prices by and large respond to the exchange rate (which has been confirmed in

many countries), the table supports the common observation that a devaluation brings net benefits to agricultural producers. A devaluation of the kind exemplified here also happens to be fairly neutral in its overall distributional effects on rural incomes, although it is progressive with respect to agricultural income only.

The main qualification to all the results in tables 51 and 53 concerns the effects on the cost of the family's food budget. As is seen in the following section, that concern is indeed important for some groups of farmers.

In reviewing all the price scenarios in this chapter, it should be borne in mind that relative price changes do occur over time. In Honduras, the index of farmgate prices declined relative to the implicit GDP deflator of about 20 percent betwen 1970 and 1985 (chapter 6). Hence the results of table 51 can be applied in a negative direction, and in twice their magnitude, to approximate the effects on farmer's real incomes that were caused by the changes in the terms of trade over that period.

Incorporating the Price Responsiveness of Consumption Expenditures

The effects of prices on consumption are analyzed first by reviewing only their effects on farms' incomes and consumption budgets, without taking into account any changes in quantities consumed. Then, as noted, some comments are made regarding the

effects of incorporating price elasticities of demand in order to capture the quantity changes. It turns out that these second-stage effects are of a fairly minor order of magnitude, and so the basic results are found in the first stage.

This analysis is carried out only for corn, as it is the most important product in both supply and demand. In the poorer rural families, corn accounts for almost 40 percent of food expenditures, and it is the source of 56 percent of the calories and 50 percent of the protein in the diet of those families. (See chapter 4.) Corn is grown by the vast majority of Honduran farmers of all income levels. According to the 1974 census, the following percentages of farms planted at least some corn, by farm size class: Farms with 0-2 hectares, 84 percent; 2-3 hectares, 87 percent; 3-5 hectares, 87 percent; 5-10 hectares, 87 percent; and 10-20 hectares, 86 percent.

One of the principal conclusions of this section is that when consumption effects as well as income effects are taken into account, an increase in corn prices is found to have regressive effects in rural areas. The welfare of the poorest farmers is diminished both in absolute and relative terms by an increase in the price of corn. Of course, the effects are also regressive in urban areas, as corn accounts for a higher share of the consumption budget among the poor, so on a nationwide basis the effects are regressive.

These results are well known for urban areas but not so well known for rural areas. The reaon for the results is that the smallest farms (which, however, represent 37 percent of farms) produce less corn than they consume, and all farms engage in both buying and selling of corn, even though their purchase price is greater than their sales price.

Table 54 works through the static effects on income and consumption expenditures of a hypothetical 10 percent increase in the price of corn for the 1975. The analysis places a different valuation on home retentions than on purchases of corn. The latter are valued at the rural market price of 275 lempiras per ton. Home retentions are valued at their opportunity cost, which is the farmgate price (211 lempiras/ton) that would have been received if the product had been sold at harvest time rather than being retained in the household. The "consumption price" in table 54 is the appropriate weighted average of the farmgate price and the rural purchase price. The consumption price varies by farm size stratum, according to the proportion of consumption that is satisfied by home retentions.

Near the bottom of table 54 two measures of welfare change are presented. The first one, "net change in welfare," is simply the increase in value of corn sold less the increase in the cost of corn purchased. It also may be calculated as the increase in harvest value less the increase in consumption

value, where the consumption value is the "consumption price" times the quantity of corn consumed. This measure, either way it is calculated, reflects the actual patterns of production, sales, home retentions, and purchases by farm households. In all cases, farms purchase more corn than they strictly need to, judging by the size of the harvest, because some of the harvest must be sold to repay input loans and to buy other consumption necessities.

The second measure of welfare change, called "potential change in welfare," is calculated by assuming that own production is used to satisfy all household consumption requirements, to the extent permitted by the level of production, before any of the product is sold. Potential purchases, therefore, if any, are simply consumption less production. If production exceeds consumption, then potential sales are defined as production less consumption. The potential change in welfare is then the value of the change in potential purchases or sales, using the rural market price for the valuation.

Table 54 reports these calculations and shows that, when both income and consumption are taken into account, an increase in the corn price has a regressive incidence. Also, its net effect is negative in absolute terms for the smallest farms (0-2 hectares) and generally positive for all the other farm size groups. The positive effect is largest for the largest farms.

The smallest farms could lessen the negative effect of the corn price increase by planting more corn, and therefore purchasing less from the market. However, if the previous cropping pattern was optimal from the farmer's viewpoint, then planting more corn would entail a loss of income from substitute crops, and that loss of income could be greater than the gain of income from a larger corn harvest, even under the higher corn price. Thus, it is an empirical matter as to the net welfare effects of such a strategy, but it is possible that it would make the farmer yet worse off. These considerations explain why it is possible that the supply function for a crop could have a perverse shape under certain circumstances.

From a policy viewpoint, it is fortunate that the net welfare loss to the small-farm households is small in magnitude, and that it is very much outweighed by the welfare gains on larger farms. Nevertheless, taking into account the urban poor and the rural landless, it is clear that a corn price increase would have negative effects on the poor throughout Honduras, and this consequence should be weighed against the benefits arising out of stronger production incentives when new pricing policies are designed. It also is clear that improvements in the welfare of small-farm households will have to come from the direction of technological progress, and/or expansions in their resource base, rather than from pricing policy. (Changes in input prices will not cause a very

significant improvement in their welfare, as their expenditures on inputs are quite small.)

Consumer and Producer Responsiveness

Taking into account economic responses is not simply a matter of incorporating supply and demand elasticities for the product under consideration, and adjusting production and consumption levels accordingly. Substitution effects occur in both production and consumption. On smaller Honduran farms, which are constrained by both physical resource limitations and a scarcity of cash income for input purchase, an increase in corn production will almost necessarily entail a reduction in output of other crops. Therefore, while adjusting production and consumption patterns could improve the farm household's net welfare position in response to the price change, the improvement is likely to be small. Another consideration is that the relevant own-price elasticities are small in magnitude. Supply elasticities for basic grains usually are around 0.2 or 0.3, and price elasticities of demand for those goods usually have approximately the same value, with the opposite sign.

In the case of the smallest farms, *if* there are no substitution effects in production, and if the supply elasticity of corn were 0.2, then taking account of supply responsiveness would approximately cancel the negative net

welfare effect, but it would not make it positive. Therefore, since we know crop substitution effects do exist, the conclusion is that the net welfare effect still would be negative for those farms, even taking into account supply responsiveness.

Chapter 8

SUMMARY AND CONCLUSIONS

Introduction

This study may be best characterized as an assessment. It attempts to document and assess the status of income of Honduran farmers, with emphasis on the smallholders, and of levels of consumption and nutrient availability for both rural and urban populations. It also makes evaluations of the time trends, assesses some of their implications, and draws out some points of relevance for policy formation in Honduran agriculture. Much of the policy discussion concerns pricing and marketing policy, as these areas are central to both the formation of farm incomes and the ability of households to satisfy their food consumption needs. Other policy areas are discussed also, including questions of land use policy.

Of necessity, much of the study is concerned with developing a statistical base and interpreting the statistics from a perspective of economic development issues. The study goes beyond any previous study of Honduran agriculture in this regard. In a methodological sense, it can be regarded as an exercise in assembling existing statistical information in a way that is relevant to production and consumption issues, and in developing economic interpretations of that information.

The authors are very aware of the limitations of the data that are used, and above all they regret the lack of more

up-to-date cross-sectional surveys and censuses. However, the main conclusions appear to be reasonably robust. Cross-sectional structural characterizations, such as those concerning farm size distributions, farm income sources, and relative consumption levels, are not likely to change very rapidly over time, we feel that the report's conclusions are relevant to policy formation today.

If the report proves to be relevant, the authors wish to urge the Honduran Government and the concerned international agencies to develop new surveys and to reconcile the existing inconsistencies in the data series that are compiled by different agencies. On some issues, it is impossible to proceed further with policy analysis without better information.

The report's main findings and conclusions are summarized in this chapter in fairly brief form, as they all are discussed more extensively in the preceeding chapters. They are given in approximately the order that they are first presented in the main text.

The Aggregate Economy and the Agricultural Sector

After more satisfactory growth in the 1960's, the 1970's and 1980's have been a period of stagnation in the Honduran economy. Per capita real GDP in the years 1983-1985 was about

equal to its level in 1970. It increased in the first part of the 1970's, and then it declined by 1.6 percent per year from 1978 to 1985. Real private consumption declined over the 1970-85 period. One of the main sources of the decline in the aggregate growth rate was a drop in the growth rate of exports and, therefore, of imports as well. Unlike some other economies in the region, Honduras has not tried to sustain import growth by incurring high levels of external indebtedness. Honduras still has the lowest per capita income levels in Central America, but since 1960 it has been gaining on El Salvador and Nicaragua in this respect.

For the entire 1970-85 priod, the agricultural sector expanded less rapidly than the economy as a whole, although it still accounts for the largest share, by far, of export earnings. In more recent years, agricultural GDP has expanded more rapidly than non-agricultural GDP, but the internal intersectional terms of trade have turned against agriculture since 1978, so the real purchasing power of farm incomes has actually declined since that year.

The population and the labor force have been shifting to urban areas in proportionate terms, but the rural population still is growing in absolute terms. Output per worker has been growing more rapidly in agriculture than in other sectors, especially since 1978. It is very likely that per capita real income is declining in urban areas, and that conjecture is

consistent with the spread of shantytown zones in the major cities. Nevertheless, the average urban household still has about four times the income that the average rural household does.

Within the agricultural sector, growth has been led by the export crops, particularly by coffee, cotton, pineapple, sugarcane, palm oil, tobacco, tomatoes, and other fruits such as cantaloupe. Much of the coffee growth, however, has come in the form of higher prices on world markets, and the prospects for continued expansion of sugar are doubtful. As those crops are two of the major export products, and other major export items such as bananas and beef have had lower growth rates, the prospects for a continuation of export-led growth are uncertain. The newer products probably will continue to expand rapidly in export volume but their weight in production and exports still is small.

A few domestically oriented products, notably rice and poultry, have shown good growth performance, but on the whole domestic consumers have come to depend more on imports, especially on wheat, milk products, and (indirectly) animal feed products.

Abour three-quarters of the sector's annual growth (2.6 percent per year over the 1970-84 period) has depended on yield increases, and the rest on expansion of the base of cultivated land. However, the area cultivated appears to be sensitive to

movements in relative prices, and in recent years it has declined as the terms of trade for the sector have worsened.

In physical terms, there are some possibilities for opening new land for cultivation, through provision of transportation infrastructure and, in some areas, facilities for flood control and drainage. There is even greater potential for expanding the amount of irrigated land, but institutional weaknesses appear to be a bottleneck there.

On the whole, the domestically oriented crops are more labor intensive, and are cultivated proportionately more on the small farms, which have a higher endowment of family labor per hectare than the larger farms do. Thus, a growth strategy that favored those crops, and the smaller farms, could be expected to generate more employment. However, labor is more productive in the export crops and on the larger farms, and so emphasizing the domestic crops could tend to lower average unit returns to labor in the sector unless significant gains in productivity are made in those crops.

By several measures, the smaller farms are more efficient in the use of land, although not in labor. They generate higher levels of income per hectare (even though they cultivate proportionately less area in the higher value export crops), they utilize a greater percentage of their available farmland, and they have higher cropping intensitites. Therefore, as land, and not labor, is the main scarce factor in the sector,

economic policies that favored production on the smaller farms could be expected to improve the economic growth rate in the sector as a whole. One such measure that merits consideration would be a tax on agricultural land. A progressive tax, with respect to size of holding, would encourage larger scale landowners to utilize the land more efficiently or to sell off parts of the holdings so that they are reduced to sizes that can be managed more effectively. The report points out that even a uniform land tax would tend to encourage the same reactions.

The distribution of land holdings is quite unequal, with about two-thirds of the farms under 5 hectares in size. Farms of this size account for only 8 percent of the agricultural land. A land tax would have to exempt the smallest farms because their incomes are about at subsistence level. As well as improving the efficiency of land use, the tax would tend to make the distribution of land holdings somewhat less skewed. In this sense, it would represent a market oriented alternative to traditional agrarian reform -- referring in this case to a policy that would tend to encourage the functioning of land markets.

Another issue in the area of land policy is the fact that for historical reasons, only about one percent of Honduran farmers have fee simple title to their land. This problem has been recognized and programs are underway to address it.

Consumption Levels and Nutrient Availability

This study has developed the first time series estimates of nutrient availability for the Honduran population, and also it has developed new estimates of the cross sectional distribution of nutrient availability, by household income level. Based on this information, some statistical relationships are formulated regarding the determinants of nutrient intake.

The available time series data have important deficiencies, including marked incosistency among the estimates published by different Government agencies. Nevertheless, a careful review of the available data at the product level indicates that per capita consumption of both protein and calories has declined over the 1970-84 period. Two factors appear to account for this decline: (1) a decline in real per capita private consumption, as more resources have been shifted into public consumption during a period of a stagnant economy, in terms of per capita real income; and (2) a change in mix of foods on the supply side, with increasing relative scarcity of the cheapest foods (corn and beans) in terms of the cost per unit of protein and per calorie.

In spite of this overall picture, some foods have increased in per capita levels of availability. Unfortunately, the largest sources of increase in calorie availability, sugar and vegetable oil, have no protein content, and the next

largest source, wheat, is entirely imported. Thus, the main positive forces in the nutrition picture all carry significant disadvantages with them.

For cross-section estimates, the 1978-79 Household Survey of the Ministry of Economy and Trade was utilized. Previous estimates from those data of nutrient intake were revised, by expanding the number of foods included in the analysis from 23 to 186. For some income strata, this revision significantly changed the estimated nutrient intake, adding as much as 200 calories to the per capita daily consumption.

According to the new estimates, for the nation as a whole the average per capita daily ingestion of calories was 1,891 in 1978-79, wich represents a 10 percent deficit with respect to the accepted minimum standard of adequacy. For rural areas, the corresponding estimate was 1,716 or a 20 percent deficit, and for the lowest of 7 income strata in rural areas the estimate was 1,564 calories, or a deficit of 27 percent. This last figure implies noticeable malnutrition within that group. Given these estimates, the lack of improvement in the nutrition picture over time is a matter of greater concern.

A similar amount of deprivation was found with respect to protein intake. Overall, urban groups have better nutrient intake levels than rural groups do, even for the same per capita income levels, and in spite of the fact that the average cost per calorie and per gram of protein is higher in urban

areas. A family in a small city consumes 122 more calories per person per day than its rural counterpart family, and a similar increase occurs with a move from small cities to larger cities.

There are significant rural-urban differences and income differences in the composition of foods consumed. For the poorest rural group, corn accounts for 56 percent of the calorie availability, while for the highest urban income stratum, corn accounts for only 13 percent of calorie availability. Wheat provides only 10 calories a day per person for the rural poor, and 270 calories a day for the urban rich.

Statistical analysis shows that rural-urban taste differences exist in the case of some foods, such as wheat, but that for others, such as rice, the apparent rural-urban differences in consumption patterns are explained by income differences. The anlysis includes estimation of demand functions for calories and proteins, and for individual foods. Corn is found to be an inferior good, and wheat has a higher income elasticity of demand than rice does.

Marketing Programs

The Honduran Government maintains three kinds of programs affecting food marketing, apart from those concerned with direct distribution of PL 480 foods in special programs for the needy. It regulates the retail prices of 63 products (including nonfood items); it operates a network of 98 retail

stores through an agency known as BANASUPRO (the acronym for the Suplidora Nacional de Productos Basicos); and it purchases staple foods from farmers, stores them, and sells them to millers and wholesalers through an institution known as IHMA (Instituto Hondureno de Mercadeo Agricola).

The price regulation program attempts to protect consumers from predatory pricing by wholesalers and retailers, but it has some inherent weaknesses. There are very few inspectors to ensure compliance, and the data and staff capabilities are insufficient to support the analytic taks of determing what the fixed price levels should be. Setting prices either too low or too high creates problems, either of supply shortages or of implicit taxation of consumers. Programs like this are difficult to implement well, and in Honduras there is a consensus that the administered price levels are rather widely evaded and therefore ineffective.

The BANASUPRO stores sell more than 700 items, most of which are food items, but there are no fresh fruits or vegetables in the product line. BANASUPRO has encountered growing financial problems in recent years, and a number of proposals have been put forth to rectify that situation. However, the more basic questions are whether in fact BANASUPRO is serving the appropriate target group of consumers, and whether it is supplying staple foods to them at a lower cost than they would otherwise incur. This report reviews a number

of aspects of BANASUPRO's operations and concludes that it is not achieving its basic objectives in this regard.

The root of the problem appears to be an inappropriate diagnosis of the food price situation. A scheme like BANASUPRO is a remedy for a situation of monopoly or oligopoly power in the food marketing chain. However, no evidence has been presented that such is the case. Rather, the prevailing food prices at the consumer level are the outcome of the technology used in the marketing chain, including the storage and transportation facilities. Evidence presented in this report indicates that the proportionate gap between farmgate and consumer prices has been increasing over time, and there is a consensus that there has been insufficient investment in more modern technologies of storage, transportation, and marketing. If this is indeed a more relevant diagnosis, then in fact the system of retail price controls could be counterproductive in that it would discourage to some extent the needed investment in the food marketing chain.

The report also reviews alternative modes of extending food subsidies to the poorer households in the society. The discussion of these issues does not pretend to be definitive, but the text attempts to frame the most relevant questions for further research and policy consideration.

IHMA also is encountering financial difficulties, greater than those faced by BANASUPRO. But, again, the most pertinent

question is another one: is IHMA affecting market prices, in the desired directions, by its buying and selling operations? In other words, does it offer farmers higher prices than they otherwise would receive, and/or does it bring about lower prices to consumers? IHMA has been decreed a monopoly importer of basic foods, and so it has three instruments available for achieving these goals: importing food, setting "guaranteed prices" for farmers for four staples (corn, beans, rice and sorghum), and varying the volume of its purchase and sales operations in those products.

Statistical analysis of IHMA's operations revealed the following: (1) the imports, and more so domestic production, put downward pressure on domestic prices when they increase, not surprisingly; (2) that for corn, beans, and sorghum, variations in the guaranteed price had no perceptible effect on the wholesale market price; and (3) that the volume of IHMA's purchases (except for sorghum) did have an influence on the market price -- in a downward direction as the volume increased. These results suggest that the net effect of IHMA's operations is not to the benefit of farmers, that the guaranteed price is not an effective policy instrument (as it is administered), and that IHMA provides some net benefit to consumers. The first of these conclusions is reinforced by information that shows that only a minority of farmers are able to sell directly to IHMA, and that often IHMA payments to participating farmers are delayed.

In recent decades, many other countries besides Honduras have struggled with variants of guaranteed price programs and consumer-oriented food programs, and doubts about the effectiveness of those programs have been raised on many occasions. Thus, it is no surprise that this study finds that the Honduran programs in this area may not be particularly effective in achieving their goals. This study is not a definitive review of those programs, but the conclusions suggest that the programs merit careful review and that perhaps alternative ways of attaining the goals should be explored.

Prices and Pricing Policy

Viewed from an international perspective, there are not many price distortions in Honduran agriculture at the producer level. In three products, corn, beans, and milk, the prices have been below the border price equivalent in recent years, and in two rice and sugar, it has been above it. The biggest distortion is found in sugar, and in the case of corn the deviation from the border price equivalent is small. In all four cases of significant deviation, the prices apparently have influenced supply trends, for production of sugar and rice has been expanding rapidly, and in the case of milk and beans it has been expanding slowly or contracting. The sugar subsidy entails substantial fiscal losses.

As noted previously, the agricultural GDP deflator has declined relative to its nonagricultural counterpart since

1970, so the purchasing power of farm incomes has declined. At the same time, productivity in marketing activities has not been increasing sufficiently rapidly, and this means consumers are paying higher prices than they otherwise would have to.

Of concern to the poorer farmers is the fact that the real price of corn has declined over the 1970-85 period. While there are debates over the price-responsiveness of production of staples, studies in many developing countries have established that there is at least some responsiveness, so this real price trend may have contributed somewhat to the unsatisfactory growth performance of corn production.

At the consumer level, one of the most pronounced trends in prices has been a decline in the price of wheat flour relative to the retail price of most other basic foods. Regression analysis of the determinants of wheat demand indicates that this trend in prices has strongly influenced the change in consumer diets toward more use of wheat products. It seems likely that the pricing policy on wheat imports has encouraged the substitution, at the margin, of wheat products for corn and other traditional staples in the average diet.

Another issue regarding wheat pricing concerns the policy for the administered ex-mill prices of flour. In practice, the price is set at different levels in different mills, for the same quality flour. Those differences are said to reflect differences milling costs, but of course, in economic terms

the effect of that policy is to reward inefficiency in milling. For both these wheat-related issues, arguments could be made for a change in policy, for imposing an implicit tariff on the wheat imports and for making the ex-mill prices uniform. The first measure would tend to encourage production of domestic substitutes for wheat, increase farm incomes, and lessen the country's dependence on imported foods. In part, it would compensate for the price effects of an apparently overvalued exchange rate. The second measure would tend to encourage greater efficiency in milling.

The incidence of pricing policy also is analyzed. A distinction is made between the income effects on farms and the welfare effects. In the case of the latter, the change in the cost of the farm household's consumption bundle, attributable to a change in prices, is taken into account. For example, an increase in the price of a crop will bring positive income benefits to the farm, but if the farm also consumes the item, and purchases part of its food needs in the marketplace, then the net welfare benefits of the price increase will be less, and could even be negative.

For the principal domestic food crops, corn and beans, it is found that the income effects of price increases are progressive with respect to farm size; that is, the smaller farms benefit proportionately more. This statement is true with respect to farming income; when off-farm income is taken into account, and the incidence is calculated with respect to total farm household income, then the corn and bean prices are

seen to be more or less neutral instruments in the distributional sense.

However, when the prices of all principal crops move together, the income effects are regressive with respect to farm size. And, in contrast, a wage increase has clearly progressive effects on the agricultural income distribution.

The findings differ when the effects of price changes on consumption expenditures are taken into account. The net welfare effects for an increase in the price of corn become regressive, and for the smallest farms, the net welfare effects are even negative. Thus, for the households with less than 2 hectares of farmland, for the landless laboring families in rural areas, and for urban families, the net effects of an increase in the price of corn are negative. This outcome occurs for the small farms because they consume more corn than they produce, and the effect is magnified because their "consumption price" (the price they pay in the market to purchase corn) is higher than their "production price" (sales prices at the farmgate). This negative effect for the smallest farms is small in magnitude; nevertheless, its presence gives pause to recommendations to use the corn price as an instrument to induce greater production.

For this issue as well as the others mentioned in this chapter, the text in the preceding chapters offers more complete information and some additional interpretations.

Concluding Remarks

One of the goals of this study has been to improve the documentation of the Honduran agricultural sector, including the main trends and the main distributional issues. On many questions, that documentation has remained incomplete; nevertheless, interesting findings emerged. And many of those findings have relevance to the formulation of policy.

The particular policy implications have been noted in this chapter as well as in the earlier text. The more general thrusts of policy orientations that emerge from the analysis may be summarized as follows:

(i) On the whole, prices are not greatly distorted in Honduran agriculture, but they are in a few cases, and those cases have unfortunate repercussions in the agricultural economy. The sugar subsidy is costly in fiscal terms, results in an unnecessarily high price to consumers, and diverts supply side resources away from crops that would be more productive. The policy of pricing on wheat imports encourages substitution of that imported product for domestically grown staples, and also the non-uniform ex-mill prices of wheat flour encourage inefficiency in milling. The increasing dependence on imported wheat should be viewed in a context of generally increasing dependence on imported foods, and a likely slowdown in the growth rate of exports. The negative protection afforded to beans and, to a lesser extent, to corn is a contributing factor to the poor growth performance of these two crops, which are the main ones as regards nutrition for the poor.

(ii) The consumer-oriented marketing programs of the Government are not attaining their primary goals of improving the diets of the poor and reducing the cost of consumption for basic food items. Yet the nutrient availability situation is quite bad for a large segment of the population. A re-thinking of these programs is warranted, for they appear to be founded on assumptions that are not very realistic, and they are incurring fiscal losses. Alternative, targeted programs could be developed that would be more effective in achieving the national goals in this area.

(iii) Except in the case of rice, the guaranteed price program for farmers also does not appear to be achieving its goals, so it can be asked whether the managerial and physical infrastructure of that program would not be more effectively deployed in other ways, for example, in providing farmers with adequate access to grain storage facilities.

(iv) Resources in the sector have been allocated in a way that emphasizes exports, especially traditional exports and beef, and yet a different allocation would improve domestic nutrient availability and generate more farm employment. In the domestically oriented crops, however, productivity generally is low, and so greater efforts are needed in research and extension, particularly for the agro-climatic conditions of the mountain valleys.

(v) Land use policy is a key to the preceding issue of resource allocation, and it also can be utilized to improve the overall efficiency of land use in the sector. Land use policy has been relatively passive to date, save on those occasions when it has reacted to campesino pressures for agrarian reform, but it can be used in a more active way to stimulate the land market to reallocate land at the margin toward the smaller plots. The smaller farms have substantially greater efficiency in utilizing the scarce factor of land.

The issues of marketing policy and the guaranteed price system have received considerable attention in recent debates over agricultural policy in Honduras, but the other issues have not been explored very much. The analysis of this study suggests that it would be important to explore them as well.

In a methodological sense, this study constitutes a kind of sector study. It is not quite as broad as most sector studies, but by the same token it goes into much more depth in the areas of consumption, nutrient availability, and pricing and marketing policy. It also exploits the existing data base more fully than sector studies typically do, yet it stops short

of using formal models, with the exception of some ordinary least squares regressions. If there is a methodological lesson from this study, it is that while formal models certainly have a valuable role to play, it may be worthwhile to conduct a very intensive descriptive analysis of the available data prior to contructing the models. That analysis can develop the numerical consistency framework needed for a model, and it can help define the areas where the analysis cannot go further without modelling, thus helping make the modelling effort more sharply focussed. A related conclusion is that in-depth descriptive analysis may yield more policy-related insights than is generally thought. And finally, agricultural censuses and household income and expenditure surveys are very valuable for policy analysis, as are reliable time series on output and prices, and so efforts to increase the frequency of the cross-sectional data and improve the reliability of the time series data would be quite important.

REFERENCES

Economic Perspectives Inc., An Assessment of the Instituto Hondureño de Mercadeo Agrícola (IHMA), prepared for the USAID Mission to Honduras, April, 1986.

Flores, Marina, María Teresa Menchú and Marta Yolanda Lara, Valor Nutritivo de los Alimentos Para Centroamerica y Panamá, Instituto de Nutrición de Centroamerica y Panamá (INCAP), Guatamala, May, 1971.

García, Magdalena, "Pattern of Expenditure and Food Consumption in Honduras Households," Study of the Effects of Agricultural Development Policies on Food Consumption in Central America, Document No. 31A/82, SIECA, Tegucigalpa, D.C., October, 1982.

García, Magdalena, "Consumo de Alimentos e Ingesta de Nutrientes por Grupos Socio Económicos en los Hogares de Honduras," Study of the Effects of Agricultural Development Policies on Food Consumption in Central America, Document No. 42/83, SIECA, Tegucigalpa, D.C., September, 1983.

García, Magdalena, "Price and Income Elasticities of the Principal Food Commodities in Honduras," Study of the Effects of Agricultural Development Policies on Food Consumption in Central America, Document No. 44A/84, Tegucigalpa, D. C., March, 1984.

Gray, Cheryl Williamson, "Food Consumption Parameters for Brazil and Their Application to Food Policy," IFPRI Research Reports, No. 32, International Food Policy Research Institute, Washington, D.C., September, 1982.

Instituto Nacional Agrario, Información Básica de los Grupos Campesinos Beneficiarios de la Reforma Agraria, Tegucigalpa, January, 1985.

Knudsen, Odin, and Pasquale L. Scandizzo, "The Demand for Calories in Developing Countries," American Journal of Agricultural Economics, vol. 64, February, 1982, pp. 80-86.

Menchu, María Teresa, "Metodología Utilizada para el Cálculo de Necesidades Alimentarias para Diferentes Grupos de Población," mimeo, Tegucigalpa, D. C., March, 1982.

Meyers, William H., Tesfaye Teklu and S. R. Johnson, "The Impact of Rice Price Changes on Rural Income, Policy Paper Proposal, CEAP Project in Indonesia," mimeo, Food and Agricultural Policy Research Institute, Center for National Food and Agricultural Policy (University of Missouri-Columbia), and CARD/Trade and Agricultural Policy (Iowa State University), February, 1986.

REFERENCES (Cont'd)

Musgrove, Philip, "Que los Pobres Coman Mejor: Evaluación de Programas Destinados a Mejorar el Consumo Alimenticio de Familias Pobres en El Brasil," Pan American Health Organization, Washington, D. C., March, 1986.

Paliero, John L., "Comprehensive Survey: The Wholesale and Retail Food Distribution System, Republic of Honduras," report prepared by Dana Associates, Food Industry Consultants, for the Agency for International Development, Tegucigalpa, Honduras, May, 1984.

Ponce, Cámbar, Mario, "Honduras: Política Agrícola y Perspectivas," Boletín Informativo Honduras, Centro de Documentación de Honduras, Tegucigalpa, February, 1985.

Ponce, Cámbar, Mario, "Las Empresas Asociativas Campesinas en la Reforma Agraria Hondureña," preparado para la Oficina CEPAL/FAO de Chile, doct. No. 18/86, Ateneo de la Agroindustria, Tegucigalpa, March, 1986.

Sahn, David E., "Food Consumption Patterns and Parameters in Sri Lanka: A Summary of the Findings," draft, International Food Policy Research Institute, December, 1985.

Secretaría de Economía y Comercio, Censo Nacional Agropecuario, 1987. Tegucigalpa, 1978.

Seligson, M.A., E. Jones, E. Nesman, J. H. Vaughn, and M. Wise, "Final Report: Baseline Survey of the Honduran Small Farmer Titling Program," report submitted by Development Associates Inc. to the USAID Mission to Honduras, October 1, 1983.

SIECA (Secretariat for Economic Integration in Central America), Estudio de los Efectos de Políticas de Desarrollo Agrícola en el Consumo de Alimentos de la Población Centroamericana, Análisis Institucional del Sector Agrícola Público y Privado, Doct. No. 37/83, Tegucigalpa, April, 1983.

USAID Mission to Honduras, Encuesta Agrícola de 1980, Tegucigalpa, 1982.

Table 1: COMPARATIVE ECONOMIC GROWTH RATES IN CENTRAL AMERICA AND PANAMA

Country	Annual Growth Rates of Real GDP (%) 1950-60	1960-70	1970-81	Per Capita GDP, 1980, in US $
Costa Rica	n.a.	6.5	5.2	2120
El Salvador	4.4	5.8	3.2	788
Guatemala	3.8	5.6	5.5	1085
Honduras	3.1	5.3	4.4	674
Nicaragua	5.2	7.3	0.8	815
Panama	4.9	7.8	4.5	1901

Note: 1986 GDP is converted to dollars at the official exchange rate.

Source: World Bank, World Tables, 3rd Edition, Washington, D.C.,1984.

Table 2: SECTORAL AND AGGREGATE GDP AT FACTOR COST, 1970-86
(million lempiras)

Year	Nominal GDP	Real GDP	Nominal Agric. GDP	Agric. Share of GDP (%)	Real Agric. GDP	Adjusted Real Agric. GDP
1970	1,307	1,172	424	32.4	407	367
1971	1,408	1,241	458	32.5	444	384
1972	1,532	1,294	492	32.1	449	400
1973	1,726	1,368	562	32.6	470	434
1974	1,915	1,359	593	31.0	429	417
1975	2,022	1,313	597	29.5	389	387
1976	2,340	1,401	722	30.9	425	435
1977	2,907	1,534	964	33.2	449	538
1978	3,401	1,678	1,048	30.8	485	531
1979	3,882	1,780	1,135	29.2	518	521
1980	4,432	1,839	1,263	28.5	539	518
1981	4,691	1,851	1,313	28.0	548	507
1982	5,018	1,846	1,381	27.5	552	491
1983	5,283	1,827	1,450	27.5	567	478
1984	5,601	1,872	1,527	27.2	584	483
1985	5,951	1,902	1,618	27.2	601	480
1986	6,315	1,938	1,703	27.0	610	485
Annual growth rates (%):						
1970-78	12.7	4.6	12.0		2.2	4.7
1978-86	8.0	1.8	6.3		2.9	-1.1
1970-86	10.3	3.2	9.1		2.6	1.8

Notes:

1) Real series are expressed in 1966 constant prices.
2) The "adjusted real agricultural GDP" is nominal agricultural GDP divided by the non-agricultural GDP deflator; this construct is an approximate measure of the purchasing power of agricultural incomes over non-agricultural goods and services.
3) Table 2 uses 1978 as a base year. For conversion purposes, the ratio of 1978-price values to 1966-price values for the GDP deflators are as follows: total GDP, 2.027; non-agricultural GDP, 1.972; agricultural GDP, 2.161.

Sources:

Based on basic national accounts data from the Banco Central de Honduras and on Table 4.

Table 3. POPULATION AND PER CAPITA GDP, 1970-86
(thousands of persons and lempiras/person)

Year	Total Pop.	Urban Pop.	Rural Pop.	Rural Share (%)	Per Capita Nominal GDP	Per Capita Real GDP
1970	2,639	760	1,879	71.2	495	444
1971	2,720	801	1,918	70.5	518	456
1972	2,805	845	1,961	69.9	546	461
1973	2,895	892	2,003	69.2	596	473
1974	2,991	942	2,049	68.5	640	454
1975	3,093	996	2,097	67.8	654	425
1976	3,202	1,055	2,148	67.1	731	438
1977	3,318	1,117	2,201	66.3	876	462
1978	3,439	1,183	2,256	65.6	989	488
1979	3,564	1,252	2,312	64.9	1,089	499
1980	3,691	1,324	2,367	64.1	1,201	498
1981	3,821	1,400	2,421	63.4	1,228	484
1982	3,955	1,480	2,475	62.6	1,269	467
1983	4,092	1,563	2,530	61.8	1,289	447
1984	4,232	1,649	2,583	61.0	1,340	442
1985	4,372	1,737	2,635	60.3	1,361	435
1986	4,514	1,827	2,687	59.5	1,399	429
Annual growth rates (%):						
1970-78	3.4	5.7	2.3		9.0	1.2
1978-86	3.5	5.6	2.2		4.4	-1.6
1970-86	3.4	5.6	2.3		6.7	-0.2

Note:

Per capita real GDP is expressed in 1966 constant prices.

Sources:

CONSUPLANE and Table 2

Table 4. GENERAL PRICE INDEXES, 1970-86
(1978 = 1.00)

Year	GDP Deflator	Agricultural GDP Deflator	Non-Agric. GDP Deflator	Consumer Price Index	Wholesale Price Index
1970	.550	.482	.586	.619	
1971	.560	.477	.604	.632	
1972	.584	.507	.624	.652	
1973	.623	.553	.657	.682	
1974	.695	.640	.721	.769	
1975	.760	.710	.782	.831	
1976	.824	.786	.841	.873	
1977	.935	.994	.908	.946	
1978	1.000	1.000	1.000	1.000	1.000
1979	1.076	1.014	1.104	1.121	1.105
1980	1.189	1.084	1.236	1.324	1.306
1981	1.250	1.109	1.314	1.448	1.372
1982	1.341	1.158	1.425	1.578	1.473
1983	1.424	1.184	1.538	1.709	1.564
1984	1.495	1.224	1.625	1.789	1.580
1985	1.551	1.260	1.711	1.849	1.612
1986	1.620	1.307	1.784	1.930	1.649
Annual rates of change (%):					
1970-78	7.8	9.6	6.9	6.2	n.a.
1978-84	6.9	3.4	8.4	8.6	7.9
1970-84	7.4	6.9	7.6	7.2	n.a.

Note:

The GDP deflators are derived from the national account series expressed in 1966 constant prices.

Source:

Computed from data published by the Banco Central de Honduras.

Table 5. OFFICIAL MINIMUM RURAL WAGES
(lempiras/day)

Year	Official minimum wage	Official minimum rural wage divided by: GDP deflator	Consumer price index	Consumer price of corn
1974	2*	2.9	2.6	16.67
1975	2	2.6	2.4	11.11
1976	2	2.4	2.3	15.38
1977	2	2.1	2.1	9.52
1978	2	2.0	2.0	10.00
1979	3	2.8	2.7	15.00
1980	3.6	3.0	2.9	13.85
1981	4.5 (4.3)	3.6 (3.4)	3.3 (3.2)	20.45 (19.55)
1982	5 (4.6)	3.7 (3.4)	3.3 (3.1)	22.75 (20.91)
1983	5 (4.6)	3.5 (3.2)	3.1 (2.8)	18.52 (17.04)
1984	5 (4.6)	3.3 (3.1)	3.0 (2.8)	26.32 (24.21)
1985	5 (4.6)	3.2 (3.0)	2.7 (2.5)	23.81 (21.90)
1986	5 (4.6)	3.1 (2.8)	2.6 (2.4)	19.23 (17.69)

*May-December 1974.

Notes:

1) The changes in the official minimum rural wages were as follows: end of 1978, from 2 to 3; end of May 1980, from 3 to 4; June 20, 1981, from 4 to 5.
2) Figures in parentheses refer to wages applicable to establishments hiring 5 or fewer workers.
3) The price indexes are defined on a basis of 1978 = 1.00.
4) The consumer price of corn is expressed in lempiras per lb. (table 44).

Source:

Secretaría de Economía y Comercio.

Table 6. THE COMPOSITION OF AGGREGATE EXPENDITURE
(million lempiras at 1966 prices)

Year	Private Consumption	Public Consumption	Gross Fixed Capital Formation	Inventory Change	Exports	(Minus) Imports
1970	962	152	207	27	390	441
1971	970	157	195	-2	437	390
1972	1013	167	192	7	422	379
1982	1483	294	333	-61	535	532
1983	1452	297	340	-52	562	556
1984	1426	301	374	5	596	593
1985	1480	318	336	47	623	642
1986p	1544	339	292	4	656	627
Growth rates (%):						
1970-86	3.0	5.1	2.2	n.a.	3.3	2.2
1970/72 to 1981/84	3.0	5.1	3.8	n.a.	2.9	3.1

Note: n.a. = not applicable.

Sources:

Banco Central de Honduras, Cuentas Nacionales de Honduras, 1970-80, Tegucigalpa, D.C., 1982; Banco Central de Honduras, Honduras en Cifras, 1979-84, Tegucigalpa, D.C., 1985.

Table 7. ESTIMATES OF THE ECONOMICALLY ACTIVE POPULATION IN HONDURAS, 1960-86
(in persons)

Year	All Sectors			Agriculture		
	Urban	Rural	Total	Urban	Rural	Total
1960	133,403	415,055	548,458	21,535	348,213	369,748
1961	142,087	425,901	567,988	22,538	356,587	379,125
1962	151,181	437,032	588,213	23,578	365,164	388,742
1963	160,705	448,454	609,159	24,656	373,947	398,603
1964	170,677	460,174	630,851	25,773	382,942	408,715
1965	181,114	472,201	653,315	26,930	392,153	419,083
1966	192,036	484,542	676,578	28,128	401,585	429,713
1967	203,466	497,205	700,671	29,370	411,244	440,614
1968	215,421	510,200	725,621	30,655	421,136	451,791
1969	227,926	523,534	751,460	31,986	431,266	463,252
1970	241,001	537,219	778,220	33,364	441,639	475,003
1971	251,961	547,632	799,593	34,790	452,262	487,052
1972	263,306	558,247	821,553	36,268	463,140	499,408
1973	275,048	569,068	844,116	37,796	474,280	512,076
1974	287,200	580,100	867,300	39,376	485,691	525,067
1975	308,035	596,176	904,211	41,013	497,373	538,386
1976	327,236	610,143	937,379	42,707	509,337	552,044
1977	347,326	624,438	971,764	44,459	521,588	566,047
1978	368,343	639,067	1,007,410	46,273	534,133	580,406
1979	390,325	654,039	1,044,364	48,148	546,981	595,129
1980	413,312	669,365	1,082,677	50,089	560,137	610,226
1981	439,055	684,479	1,123,534	52,096	573,610	625,706
1982	465,998	669,935	1,165,933	54,171	587,407	641,578
1983	494,192	715,739	1,209,931	56,317	601,536	657,853
1984	523,689	731,901	1,255,590	58,535	616,005	674,540
1985	554,547	748,428	1,302,975	60,830	630,822	691,652
1986	588,423	764,309	1,352,732	63,202	645,995	709,197

Source: CONSUPLANE.

Table 8: AREA PLANTED IN MAJOR CROPS, 1970-1986
(hectares)

Year	Corn	Beans	Sorghum	Rice	Sugarcane
1970	281,831	72,219	34,530	10,694	30,228
1971	282,546	71,635	36,155	11,222	26,985
1972	283,261	71,050	37,780	11,776	26,729
1973	283,977	70,466	39,405	12,358	26,474
1974	287,011	62,075	52,802	13,549	25,982
1975	286,284	62,015	42,655	14,218	25,734
1976	330,532	73,525	55,605	20,692	28,170
1977	380,705	75,111	60,702	17,998	27,827
1978	430,878	76,696	65,799	15,304	27,484
1979	418,260	81,305	73,554	15,618	30,467
1980	351,988	59,789	51,676	20,294	23,645
1981	339,243	68,165	61,845	19,658	34,770
1982	338,985	76,471	58,364	21,212	52,200
1983	286,515	58,396	30,669	14,965	51,992
1984	286,852	49,883	49,817	20,976	39,013
1985	331,520	78,541	45,415	18,728	44,765
1986	322,374	76,342	48,594	20,713	41,802
Growth Rate (%)	0.8	0.3	2.2	4.2	2.0

Year	Bananas	Coffee	Cotton	Plantain	Cassava
1970	21,463	98,749	3,958	6,289	3,813
1971	20,922	100,683	3,252	6,618	3,700
1972	20,394	102,617	3,637	6,947	3,591
1973	19,879	104,551	7,240	6,837	3,485
1974	18,924	101,589	6,084	7,629	3,290
1975	18,813	108,419	8,210	7,934	3,193
1976	19,192	110,353	4,600	8,263	3,099
1977	19,576	112,287	10,245	8,592	3,008
1978	19,968	114,221	17,707	8,921	2,918
1979	20,298	114,651	13,271	9,014	2,995
1980	20,903	122,614	12,730	5,625	1,294
1981	19,300	122,864	7,800	6,107	1,363
1982	17,594	122,500	8,023	15,200	843
1983	17,889	122,012	6,267	14,940	352
1984	20,386	125,918	7,630	10,185	2,058
1985	20,758	124,113	7,258	10,527	
1986	19,797	122,688	4,334	10,753	
Growth Rate (%)	-0.5	1.4	0.6	3.4	-4.3

(cont.)

Table 8 (cont.): AREA PLANTED IN MAJOR CROPS, 1970-1986
(hectares)

Year	Coconut	Sesame	Pineapple	Cantaloupe	Watermelon
1970	2,686	1,084	1,113	181	637
1971	2,946	1,134	1,154	201	697
1972	3,205	1,185	1,196	224	757
1973	3,464	1,235	1,240	250	863
1974	3,857	1,379	1,344	365	1,093
1973	4,127	1,385	1,394	407	1,187
1976	4,417	1,436	1,445	454	1,288
1977	4,726	1,486	1,506	505	1,398
1978	5,057	1,536	1,553	563	1,517
1979	5,001	4,434	2,629	701	1,605
1980	4,957	3,200	3,163	671	988
1981	3,500	4,100	3,200	1,000	1,300
1982	3,800	5,018	4,000	1,200	1,500
1983	4,463	4,020	4,548	1,195	1,280
1984					
Growth Rate (%)	4.0	10.6	11.4	15.6	5.5

Year	Potatoes	Onions	Garlic	Tomatoes	Cabbage
1970	577	312	78	1,073	630
1971	563	348	80	1,174	644
1972	549	384	82	1,275	657
1973	535	439	84	1,376	670
1974	688	574	87	1,560	550
1975	720	457	89	1,578	549
1976	754	493	91	2,065	549
1977	791	529	93	2,376	548
1978	830	565	95	2,734	547
1979	814	614	110	2,781	574
1980	594	342	97	1,618	293
1981	600	500	109	3,800	420
1982	800	600	100	3,500	900
1983	697	598	105	3,652	712
1984	899	365			706
Growth Rate (%):	3.2	1.1	2.3	9.9	0.8

(cont.)

Table 8 (cont.): AREA PLANTED IN MAJOR CROPS, 1970-1986
(hectares)

Year	Staples	Export Crops	Roots & Veg.	Others	Total
1970	405,563	154,398	6,483	5,701	572,145
1971	408,176	151,842	6,509	6,132	572,659
1972	410,814	153,377	6,538	6,567	577,296
1973	413,043	158,144	6,589	7,052	584,828
1974	423,066	152,579	6,749	8,038	590,432
1975	413,106	161,176	6,586	8,500	589,368
1976	488,617	162,315	7,051	9,040	667,023
1977	543,108	169,935	7,345	9,621	730,009
1978	597,598	179,380	7,689	10,226	794,893
1979	597,751	178,687	7,888	14,370	798,696
1980	489,372	209,892	4,238	12,979	716,481
1981	495,118	184,734	6,792	13,100	699,744
1982	510,232	200,317	6,743	15,518	732,810
1983	405,485	198,160	6,116	15,506	625,267
Growth Rate (%)	0.0	1.9	-0.4	8.0	0.7

Source:

Secretaría de Economía y Comercio, Dirección General Estadística y Censos, Anuario Estadístico, varios años, Tegucigalpa.

Notes:

Staples are corn, beans, rice, sorghum and plantain. Exportables are coffee, sugar, cotton and bananas. Roots and vegetables are potatoes, cassava, onions, garlic, tomatoes and cabbage. The years reported here are agricultural years, which run from May 1 to April 30, i.e., 1978 is the year May 1, 1977 to April 30, 1978. The growth rates are calculated for the period 1970 to the latest year for which data are available.

Table 9: PRODUCTION OF MAJOR CROPS, 1970-1984
(metric tons)

Year	Corn	Beans	Sorghum	Rice	Sugarcane
1970	337,610	45,295	44,454	13,678	950,216
1971	338,591	42,699	46,047	14,622	797,456
1972	339,576	40,103	47,640	15,632	815,266
1973	340,563	37,508	49,234	16,711	833,474
1974	342,561	34,148	40,624	19,913	873,644
1975	343,557	33,299	52,420	21,288	893,156
1976	358,129	32,406	52,271	34,584	913,104
1977	388,566	30,968	43,753	27,519	933,497
1978	419,002	29,529	35,236	20,454	954,346
1979	519,254	43,839	52,998	28,058	1,190,455
1980	345,582	28,527	37,916	24,381	1,411,065
1981	388,217	35,943	52,216	22,462	1,079,782
1982	481,656	42,256	57,645	36,719	2,818,000
1983	379,401	36,225	33,414	21,879	2,838,700
1984	406,813	30,157	44,244	46,229	2,746,608
1985	382,045	50,682	38,727	34,000	2,995,182
1986	412,364	49,182	32,136	40,318	2,994,909
Growth Rate (%)	1.3	0.5	-2.0	7.0	7.4

Year	Bananas	Coffee	Cotton	Plantain	Cassava
1970	874,860	37,984	3,205	110,399	28,341
1971	863,489	39,456	2,053	113,434	26,722
1972	852,265	40,927	2,290	116,469	25,104
1973	841,187	42,399	4,267	119,505	13,860
1974	819,979	41,778	11,847	51,483	11,258
1975	852,779	45,342	5,129	54,057	10,213
1976	886,890	46,814	3,096	56,760	9,265
1977	922,365	48,285	6,350	59,598	8,405
1978	959,260	49,757	11,386	62,578	7,625
1979	1,004,398	59,796	12,937	64,096	8,600
1980	970,721	58,563	23,150	87,463	7,193
1981	929,275	75,347	17,200	92,600	7,086
1982	824,479	72,420	18,620	123,400	6,861
1983	834,221	74,000	16,500	104,900	6,554
1984	944,315	69,351	23,030	106,163	10,202
1985	1,091,409	75,091	14,591	171,772	
1986	1,019,773	81,409	10,409	179,227	
Growth Rate (%)	1.0	4.9	7.6	3.1	-7.0

Table 9 (cont.): PRODUCTION OF MAJOR CROPS, 1970-1984
(metric tons)

Year	Coconut	Sesame	Pineapple	Cantaloupe	Watermelon
1970	14,187	766	4,636	537	2,658
1971	15,302	788	5,313	556	3,112
1972	16,416	810	6,088	576	3,566
1973	17,530	832	6,977	597	4,379
1974	16,570	946	12,981	647	7,723
1975	16,944	898	14,877	670	8,806
1976	17,325	919	17,048	694	10,041
1977	17,715	941	17,219	719	11,449
1978	18,114	1,104	17,391	745	13,054
1979	19,824	1,698	31,360	959	14,607
1980	19,468	2,400	30,230	3,218	14,247
1981	14,200	4,400	141,500	4,100	8,891
1982	13,000	4,572	160,800	4,900	5,600
1983	12,166	3,289	195,344	5,000	5,093
1984					
Growth Rate (%)	-1.2	12.2	33.3	18.7	5.1

Year	Potatoes	Onions	Garlic	Tomatoes	Cabbage
1970	3,731	1,232	202	4,620	4,270
1971	3,833	1,278	192	5,626	4,205
1972	3,936	1,471	182	6,632	4,141
1973	4,038	1,558	172	7,639	4,077
1974	3,752	1,493	96	7,081	1,284
1975	3,923	1,548	152	9,651	1,139
1976	4,102	1,606	142	9,777	1,150
1977	4,289	1,666	132	11,488	1,162
1978	4,484	1,728	121	13,499	1,174
1979	5,835	2,052	154	14,285	1,163
1980	6,323	1,287	139	28,055	2,468
1981	8,100	2,400	153	35,200	3,355
1982	8,300	2,800	400	33,700	8,500
1983	8,900	2,700	365	43,344	5,804
1984	3,820	1,891			6,557
Growth Rate (%)	0.2	3.1	4.7	18.8	3.1

Source: Secretaría de Economía y Comercio, Dirección General de Estadística y Censos, Anuario Estadístico, varios anos, Tegucigalpa.

Note: The growth rates are calculated for the period 1970 to the latest year for which data are available.

Table 10: YIELDS OF THE MAJOR CROPS, 1970-1984
(metric tons/hectare)

Year	Corn	Beans	Sorghum	Rice	Sugarcane
1970	1.20	0.63	1.29	1.28	31.43
1971	1.20	0.60	1.27	1.30	29.55
1972	1.20	0.56	1.26	1.33	30.50
1973	1.20	0.53	1.25	1.35	31.48
1974	1.19	0.55	0.77	1.47	33.62
1975	1.20	0.54	1.23	1.50	34.71
1976	1.08	0.44	0.94	1.67	32.41
1977	1.02	0.41	0.72	1.53	33.55
1978	0.97	0.39	0.54	1.34	34.72
1979	1.24	0.54	0.72	1.80	39.07
1980	0.98	0.48	0.73	1.20	59.68
1981	1.14	0.53	0.84	1.14	31.05
1982	1.42	0.55	0.99	1.73	53.98
1983	1.32	0.62	1.09	1.46	54.60
1984	1.42	0.60	0.89	2.20	70.40
Growth Rate (%)	1.2	-0.3	-2.6	3.9	5.9

Year	Bananas	Coffee	Cotton	Plantain	Cassava
1970	40.76	0.38	0.81	17.55	7.43
1971	41.27	0.39	0.63	17.14	7.22
1972	41.79	0.40	0.63	16.77	6.99
1973	42.32	0.41	0.59	17.48	3.98
1974	43.33	0.41	1.95	6.75	3.42
1975	45.33	0.42	0.62	6.81	3.20
1976	46.21	0.42	0.67	6.87	2.99
1977	47.12	0.43	0.62	6.94	2.79
1978	48.04	0.44	0.64	7.01	2.61
1979	49.48	0.52	0.97	7.11	2.87
1980	46.44	0.48	1.82	15.55	5.56
1981	48.15	0.61	2.21	15.16	5.40
1982	46.86	0.59	2.32	8.12	8.14
1983	46.63	0.61	2.63	7.02	18.62
1984	46.32	0.55	3.02	10.42	4.96
Growth Rate (%)	0.9	2.7	9.9	-3.7	-2.8

(cont.)

Table 10 (cont.): YIELDS OF THE MAJOR CROPS, 1970-1984
(metric tons/hectare)

Year	Coconut	Sesame	Pineapple	Canteloupe	Watermelon
1970	5.28	0.71	4.17	2.97	4.17
1971	5.19	0.69	4.60	2.77	4.46
1972	5.12	0.68	5.09	2.57	4.71
1973	5.06	0.67	5.63	2.39	5.07
1974	4.30	0.69	9.66	1.77	7.07
1975	4.11	0.65	10.67	1.65	7.42
1976	3.92	0.64	11.80	1.53	7.80
1977	3.75	0.63	11.43	1.42	8.19
1978	3.58	0.72	11.20	1.32	8.61
1979	3.96	0.38	11.93	1.37	9.10
1980	3.93	0.75	9.56	4.80	14.42
1981	4.06	1.07	44.22	4.10	6.84
1982	3.42	0.91	40.20	4.08	3.73
1983	2.73	0.82	42.95	4.18	3.98
1984					
Growth Rate (%)	-4.9	1.1	19.6	2.7	0.4

Year	Potatoes	Onions	Garlic	Tomatoes	Cabbage
1970	6.47	3.95	2.59	4.31	6.78
1971	6.81	3.67	2.40	4.79	6.53
1972	7.17	3.83	2.22	5.20	6.30
1973	7.55	3.55	2.05	5.55	6.09
1974	5.45	2.60	1.10	4.54	2.33
1975	5.45	3.39	1.71	6.12	2.07
1976	5.44	3.26	1.56	4.73	2.09
1977	5.42	3.15	1.42	4.84	2.12
1978	5.40	3.06	1.27	4.94	2.15
1979	7.17	3.34	1.40	5.14	2.03
1980	10.64	3.76	1.43	17.34	8.42
1981	13.50	4.80	1.40	9.26	7.99
1982	10.38	4.67	4.00	9.63	9.44
1983	12.77	4.52	3.48	11.87	8.15
1984	4.25	5.18			9.29
Growth Rate (%)	-3.0	2.0	2.3	8.1	2.3

Source: Calculated by ADAI from the source in Tables 8 & 9.

Table 11. AGRICULTURAL FOREIGN TRADE, 1975 and 1984
(thousands of current lempiras)

	Imports			Exports		
	1975	1984	Growth Rate (%)	1975	1984	Growth Rate (%)
Livestock and fish products	34,851	82,109	10.0	22,728	144,719	22.8
(Milk)	(24,445)	(63,563)	(11.2)	(1)	(464)	(n.a.)
(Seafood)	(1,363)	(4,839)	(15.1)	(20,616)	(99,764)	(19.1)
Cereals and flour	55,393	58,884	0.7	683	5,702	26.6
(wheat)	(19,551)	(34,278)	(6.4)	(0)	(0)	(n.a.)
(corn)	(13,894)	(12,437)	(-1.2)	(0)	(2,789)	(n.a.)
Fruit and nuts	3,581	8,035	9.4	130,706	522,206	16.6
(Bananas, plantains)	(0)	(0)	(n.a.)	(125,312)	(469,188)	(16.0)
(Fresh pineapples)	(0)	(0)	(n.a.)	(1,669)	(28,274)	(36.9)
Beans	239	1,824	25.3	1,712	3,324	7.7
Roots, vegetables	2,482	3,061	2.4	734	1,865	10.9
Sugar	750	831	1.1	15,126	57,722	16.0
Starch	276	566	8.3	2,651	7,669	12.5
Oilseeds, veg. oils	1,414	10,135	24.3	894	23,408	45.7
Animal feeds	2,743	12,711	18.6	1,225	221	-17.3
Coffee, cocoa, tea	708	1,777	6.8	114,094	336,708	12.8
Beverages	2,245	6,425	12.4	136	114	-1.9
Tobacco	545	2,917	20.5	15,065	31,872	8.7
Natural fibers	4,940	4,860	-0.2	9,145	15,631	6.1
Rubber and gum	2,293	6,169	11.6	797	537	-4.3
Wood and pulp	1,413	2,467	6.4	83,914	90,942	0.9
Others	1,247	22,544	37.9	3,174	5,081	5.4
TOTAL	115,119	225,433	7.8	403,248	1,249,243	15.4

Notes: Oilseeds and vegetable oils include coconut products. Fruit and nuts include jams and jellies. Roots and vegetables include mushrooms and vegetable soups. Sugar includes sugar beets and sweets.

Source: Compiled from product-level data supplied by the Secretaría de Economía y Comercio.

Table 12. COMPOSITION OF THE GROSS VALUE OF AGRICULTURAL OUTPUT, 1981

Product	Production (MT)	Farmgate Price (lempiras/MT)	Value (thousand lempiras)	Share (%)
1. Staples			188,656	16.7
Corn	388,217	277	107,536	9.5
Beans	35,943	695	24,980	2.2
Rice	22,462	905	20,328	1.8
Sorghum	52,216	312	16,291	1.4
Plantain	92,600	157	14,538	1.3
Potatoes	8,100	491	3,977	0.4
Cassava	7,086	142	1,006	0.1
2. Export Crops			693,624	61.4
Bananas	929,275	363	337,327	29.8
Coffee	75,347	3166	238,549	21.1
Sugarcane	1,079,782	27.5	29,694	2.6
Pineapples	141,500	293	41,460	3.7
Tobacco	7,364	3403	25,060	2.2
Cotton	17,200	1252	21,534	1.9
3. Oil Crops			17,826	1.6
Palm oil	89,182	152	13,556	1.2
Coconut (in shell)	14,200	138	1,960	0.2
Sesame	4,400	525[e]	2,310	0.2
4. Other Fruit			16,444	1.5
Oranges	42,000[f]	178	7,476	0.7
Grapefruit	22,000[e]	115	2,530	0.2
Mangoes	13,000[f]	142	1,846	0.2
Avocadoes	5,700	311	1,773	0.2
Watermelon	8,891	199	1,769	0.2
Cantaloupe	4,100	256	1,050	0.1
5. Vegetables			7,113	0.6
Tomatoes	35,200	132	4,646	0.4
Onions	2,400	645	1,548	0.1
Cabbage	3,355	274	919	0.1

(cont.)

Table 12 (cont.): COMPOSITION OF AGRICULTURAL OUTPUT, 1981

Product	Production (MT)	Farmgate Price (lempiras/MT)	Value (thousand lempiras)	Share (%)
6. Livestock Products			206,465	18.3
Beef	59,230	1942	115,025	10.2
Poultry	10,036	2834	28,442	2.5
Pork	11,985	2354	28,213	2.5
Milk	241,238[a]	0.43[b]	10,379	0.9
Eggs	547,222[c]	44.6[d]	24,406	2.2

Notes:
[a]Units are thousand liters.
[b]Units are lempiras per liter
[c]Units are boxes of 360 eggs
[d]Units are lempiras per box
[e]Authors' estimate
[f]FAO estimate

(The farmgate price of bananas is a weighted average of the price received for export bananas and the price received for bananas sold on the domestic market. The two prices differ by a factor of more than three.)

Source: Except as noted, Secretaría de Economía y Comercio.

Table 13. EMPLOYMENT IN AGRICULTURE, FORESTRY AND FISHERIES

Subsector/Product	1975-77	Share (%)	1980-82	Share (%)
1. Crops	275,481	83.3	313,625	82.9
Corn	89,033	26.9	91,817	24.3
Beans	14,980	4.5	17,640	4.7
Rice	1,474	0.4	1,788	0.5
Sorghum	13,364	4.0	12,492	3.3
Cassava	1,233	0.4	1,258	0.3
Plantain	2,367	0.7	4,396	1.2
Tomatoes	3,375	1.0	7,147	1.9
Bananas	23,400	7.1	26,144	6.9
Oranges	1,485	0.4	3,673	1.0
Pineapples	2,790	0.8	3,410	0.9
Palm oil	3,068	0.9	5,404	1.4
Coffee	82,894	25.1	91,648	24.2
Tobacco	18,426	5.6	20,394	5.4
Cotton	2,196	0.7	2,681	0.7
Sugarcane	12,357	3.7	19,544	5.2
Other crops	3,039	0.9	4,189	1.1
2. Livestock Products	37,687	11.4	42,581	11.3
Beef	26,100	7.9	28,146	7.4
Pork	1,891	0.6	2,497	0.7
Poultry	672	0.2	1,009	0.3
Milk	8,772	2.7	10,463	2.8
Eggs	252	0.1	466	0.1
3. Forestry	10,700	3.2	13,300	3.5
4. Fisheries	6,700	2.0	8,600	2.3
Total Economically Active Population in Agriculture	330,568	100.00	378,106	100.0

Notes: These estimates refer to persons employed. In cases of a typical farm that grows multiple crops, the employment in the farm is pro-rated over crops in proportion to the area they occupy and their labor intensity. It appears that the total employment in other crops is underestimated.

Source: CONSUPLANE

Table 14. STRUCTURE OF AVERAGE FARM INCOME, 1976

Farm Size (has.)	Family Income (lempiras)	Farm Income (lempiras)	(%)	Off-farm Income (lempiras)	(%)
0-2	986.8	607.3	61.5	379.5	38.5
2-3	1431.7	1036.2	72.4	395.5	27.6
3-5	1727.8	1318.3	76.3	409.7	23.7
5-10	2867.0	2433.2	84.9	433.8	15.1
10-20	3360.4	3008.4	90.4	352.0	9.6

Source: Inversiones y Estudios Económicos, S. de R. L., Las Condiciones de Empleo e Ingreso en el Sector Rural Pobre de Honduras, Informe IV: La Distribución por Regiones de la Población, el Empleo, y el Ingreso en el Sector Agrícola Pobre de Honduras, Tegucigalpa, D.C., 1980.

Table 15. ALLOCATION OF LAND BY FARM SIZE CLASS, 1974
(thousand hectares)

	Farm Size in Hectares					
	0-2	2-3	3-5	5-10	10-20	20+
No. of farms	72,421	28,703	23,657	28,264	19,220	23,076
Total area	75.2	69.9	93.9	201.3	268.1	1921.4
Average area[a]	1.04	2.44	3.97	7.12	13.95	83.23
Area in:						
Annual crops	58.9	40.9	39.8	56.2	49.3	121.3
Perennial crops	9.0	10.3	14.9	28.3	30.8	118.7
Fallow land	2.1	4.8	8.6	21.0	26.3	77.5
Pasture	2.6	7.0	16.3	54.3	98.7	1169.1
Forest	0.3	0.7	1.7	5.2	10.6	174.5
Unused land[b]	2.1	6.0	12.2	35.2	50.0	234.6
Other land	0.2	0.3	0.5	1.2	2.5	25.7
Percentage structure:[c]						
Annual crops	78.3	58.5	42.3	27.9	18.4	6.3
Perennial crops	12.0	14.7	15.9	14.0	11.5	6.2
Fallow land	2.7	6.8	9.2	10.5	9.8	4.0
Pasture	3.4	1.0	17.3	26.9	36.8	60.8
Forest	0.4	1.1	1.9	2.6	3.9	9.1
Unused land	2.8	8.5	12.9	17.5	18.6	12.2
Other land	0.3	0.4	0.5	0.6	0.9	1.3

Notes:

a The average area per size class is given in hectares.

b Unused land (guamiles) refers to land that is rocky, hilly or brushy; it is not necessarily unusable, but the investment required to make it usable may be costly.

c The column sums of percentages add to 100.0, subject to rounding errors.

Source:

Compiled from the Censo National Agropecuario, 1974, Secretaría de Economía y Comercio, Tegucigalpa, D.C., 1978.

Table 16. AVERAGE ALLOCATIONS OF LAND BETWEEN CROPS AND LIVESTOCK, 1974
(hectares)

	Farm Size in Hectares					
	0-2	2-3	3-5	5-10	10-20	20+
No. of farms	72,421	28,703	23,657	28,264	19,220	23,076
Area in crops and livestock	72,485	62,905	79,558	159,711	205,121	1,486,643
Average area per farm:						
Crops and livestock	1.00	2.19	3.36	5.65	10.67	64.42
Annual crops	0.81	1.43	1.68	1.99	2.57	5.26
Perennials	0.12	0.36	0.63	1.00	1.60	5.15
Fallow land	0.03	0.17	0.36	0.75	1.37	3.36
Pasture	0.04	0.24	0.69	1.92	5.14	50.66

Note:
The cited areas do not include double cropping, i.e., a hectare in annual crops is counted only once, even if it is planted twice during the year.

Source: same as for table 15.

Table 17. ALLOCATION OF CROP LAND BY FARM SIZE, 1974
(hectares)

	Farm Size in Hectares					
	0-2	2-3	3-5	5-10	10-20	20+
No. of farms	72,421	28,703	23,657	28,264	19,220	23,076
Area in crops	67,851	51,196	54,705	84,465	80,084	317,571
Average area in crops	0.94	1.78	2.31	2.99	4.17	13.76
Average planted area (including double cropping):						
Basic crops	1.11	1.91	2.25	2.65	3.27	5.93
Trad. exports	0.07	0.23	0.41	0.68	1.12	3.82
Roots, veg.	0.03	0.04	0.05	0.06	0.07	0.17
Fruit	0.02	0.04	0.07	0.09	0.14	0.35
Indust. crops	0.01	0.01	0.02	0.03	0.06	0.40
Other crops	*	0.01	0.01	0.01	0.01	0.24
All crops	1.24	2.24	2.81	3.51	4.68	10.90
Cropping intensities:						
	1.32	1.26	1.21	1.18	1.12	0.79

Notes:
1. The average area in crops does not include double cropping. The average planted area includes both double cropping and interplanting; i.e., a hectare of corn interplanted with beans is counted as two hectares, one hectare in each crop. The symbol * denotes less than 0.01 ha.

2. The cropping intensity is the planted area in all crops divided by the area in crops. The average cropping intensity for all farms in the 0-20 hectare size is 1.21.

3. The crop groups are defined as in table 18.

Source: Same as for table 15.

Table 18. AVERAGE CROPPING PATTERNS BY FARM SIZE, 1974
(hectares per crop per farm)

	Farm Size in Hectares					
	0-2	2-3	3-5	5-10	10-20	20+
1. Basic Crops	1.11	1.91	2.25	2.65	3.27	5.93
Early corn	0.69	1.16	1.35	1.58	2.01	3.82
Late corn	0.10	0.13	0.16	0.18	0.22	0.40
Early beans	0.08	0.17	0.22	0.26	0.32	0.54
Late beans	0.07	0.13	0.15	0.17	0.19	0.33
Sorghum	0.16	0.28	0.31	0.38	0.42	0.58
Rice	0.02	0.05	0.06	0.08	0.12	0.27
2. Trad. Exports	0.07	0.23	0.41	0.68	1.12	3.82
Bananas	*	0.01	0.02	0.03	0.05	0.70
Coffee	0.06	0.19	0.34	0.55	0.90	2.26
Sugarcane	0.01	0.03	0.06	0.10	0.15	0.76
Tobacco	*	*	*	0.01	0.01	0.09
3. Roots, Veg.	0.03	0.04	0.05	0.06	0.07	0.17
Cassava	0.01	0.02	0.02	0.02	0.02	0.03
Potatoes	*	*	*	*	*	0.01
Pumpkins	0.01	0.01	0.02	0.03	0.03	0.08
Onions, Tomatoes, Cabbage, Squash, Garlic	*	0.01	0.01	0.01	0.01	0.05
4. Fruit	0.02	0.04	0.07	0.09	0.14	0.35
Plantain[a]	0.01	0.03	0.05	0.06	0.10	0.17
Pineapple	*	*	*	0.01	0.01	0.03
Citrus	*	*	0.01	0.01	0.02	0.10
Mangoes, Avocadoes	*	*	*	*	0.01	0.01
Watermelon, Cantaloupe	*	*	0.01	0.01	0.01	0.04
5. Indust. Crops	0.01	0.01	0.02	0.03	0.06	0.40
Coconut	*	0.01	0.01	0.01	0.02	0.10
Cotton	*	*	*	*	0.02	0.25
Sesame	*	*	0.01	0.01	0.01	0.03
Henequen, Cacao	*	*	*	0.01	0.01	0.01
6. Other Crops[b]	*	0.01	0.01	0.01	0.01	0.24

[a] Here plantains include other members of the banana family (otros guineos), except bananas proper.

[b] Sapodilla (zapote), oil palm, chestnut, papaya, peach, quince, pepper, soy beans, rattan, forage sorghum, and others.

Table 19. AVERAGE YIELDS ON SMALLER FARMS, BY FARM SIZE, 1974
(metric tons per hectare)

	Farm Size in Hectares				
	0-2	2-3	3-5	5-10	10-20
1. Basic Crops					
Early corn	1.08	1.09	1.06	1.05	1.08
Late corn	1.05	1.01	0.98	0.98	1.01
Early beans	0.47	0.46	0.45	0.41	0.45
Late beans	0.57	0.56	0.55	0.54	0.54
Sorghum	0.78	0.69	0.67	0.66	0.64
Rice	1.37	1.32	1.29	1.30	1.23
2. Traditional Exports					
Coffee	0.42	0.40	0.38	0.39	0.40
Sugarcane	18.57	17.61	15.93	17.18	16.90
Tobacco	0.53	0.60	0.79	0.99	1.24
3. Roots and Vegetables					
Cassava	3.50	3.20	3.62	3.35	3.48
Potatoes	3.51	1.85	4.43	3.57	5.06
Onions	3.43	2.83	2.83	2.80	3.64
Tomatoes	5.60	8.76	11.31	5.59	5.72
Cabbage	2.70	4.19	2.46	2.63	2.74
Garlic	2.33	0.67	0.80	1.00	2.00
Squash	1.84	2.00	1.29	1.15	1.41
4. Fruit					
Plantain	7.20	7.72	6.64	5.99	5.78
Pineapple	1.42	1.83	1.59	1.64	1.99
Oranges	3.54	3.30	5.62	3.18	3.31
Mangoes	2.62	6.36	3.27	3.68	3.61
Avocadoes	2.11	1.94	2.07	2.33	1.96
Watermelon	7.88	7.55	8.80	7.51	8.21
Cantaloupe	1.86	2.04	3.10	1.40	2.97
5. Industrial Crops					
Coconut	8.94	5.12	5.58	5.18	7.04
Cacao	0.44	1.90	0.54	0.61	0.32
Cotton	1.20	1.17	1.67	1.36	2.22
Sesame	0.55	0.45	0.44	0.46	0.49
Henequen	0.27	0.33	0.30	0.37	0.42

Source: Censo Nacional Agropecuario, 1974.

Table 20. APPARENT CONSUMPTION OF CORN, 1970-84
(MT

	Production	Net Imports	Industrial Use	Direct Feed Use	Seed Use	Shrinkage & Losses	Apparent Direct Human Consumption
1970	337,610	-14,564	57,743	17,095	5,938	39,332	202,938
1971	338,591	-13,252	51,366	17,333	6,038	39,446	211,156
1972	339,576	-8,187	55,569	17,566	6,140	39,561	212,553
1973	340,563	1,294	67,341	17,815	5,927	39,766	211,008
1974	342,561	155	57,729	18,112	5,889	39,919	221,067
1975	343,557	44,091	55,488	18,357	5,755	43,111	264,937
1976	358,129	-16,710	56,958	18,574	6,147	41,722	218,018
1977	388,566	12,297	110,694	18,890	6,093	46,129	219,057
1978	419,002	37,101	137,744	19,119	6,409	51,411	241,420
1979	519,254	7,014	49,255	19,481	5,843	60,984	390,705
1980	345,582	48,284	116,327	19,802	6,041	43,640	208,056
1981	388,217	17,329	87,113	19,651	5,908	46,440	246,434
1982	481,656	-697	86,294	19,466	5,853	56,113	313,233
1983	379,401	10,360	89,654	19,771	5,032	44,925	230,379
1984	406,813	7,494	92,705	19,986	5,498	47,918	248,200
Annual growth rates (%):							
1970-84	1.3		3.4	1.1			1.5

Sources: Production: Secretaría de Recursos Naturales.
Net imports: Secretaría de Comercio Exterior.
Industrial use and feed use: Banco Central de Honduras (1970-82) and authors' estimates (1983-84). Most of the industrial use is for feed concentrates; another important part is for starch.
Seed use: Computed as 0.27qq per manzana cultivated.
Shrinkage and losses: 11.65% of domestic production and 7.00% of imports, based on information from IIMA.

Table 21. APPARENT CONSUMPTION OF BEANS, 1970-84
(MT)

	Production	Net Imports	Seed Use	Losses	Apparent Human Consumption
1970	45,295	-9,264	2,072	4,847	29,112
1971	42,699	-11,892	2,236	4,569	24,002
1972	40,103	-10,838	1,998	4,291	22,976
1973	37,508	-817	1,759	4,013	30,919
1974	34,148	-16,036	1,868	3,654	12,590
1975	33,299	-3,286	1,785	3,563	24,665
1976	32,406	-1,349	1,571	3,467	26,019
1977	30,968	-2,160	1,532	3,314	23,962
1978	29,529	95	1,481	3,165	24,978
1979	43,839	268	1,424	4,707	37,976
1980	28,527	2,771	1,422	3,219	26,657
1981	35,943	-2,747	1,699	3,846	27,651
1982	42,256	-2,558	1,562	4,521	33,615
1983	36,225	-2,954	1,460	3,876	27,935
1984	30,157	-2,185	1,247	3,227	23,498
Annual growth rates (%):					
1970-84	-2.9	-9.8			-1.5
1970/71 -1983/84	-2.	-10.3			-0.3

Sources: Secretaría de Recursos Naturales and Secretaría de Economía y Comercio.

Table 22. APPARENT CONSUMPTION OF RICE, 1970-84
(milled rice, in MT)

	Production	Net Imports	Industrial Use	Seed Use	Losses	Apparent Direct Consumption
1970	8,480	10,299	413	886	2,269	15,211
1971	9,066	2,698	445	929	1,584	8,806
1972	9,692	4,513	473	975	1,857	10,900
1973	10,361	477	515	1,023	1,550	7,750
1974	12,346	1,314	564	1,122	1,922	10,052
1975	13,199	11,332	620	1,177	3,047	19,687
1976	21,442	1,344	659	1,713	3,243	17,171
1977	17,062	6,660	740	1,490	3,140	18,352
1978	12,681	4,383	789	1,267	2,277	12,731
1979	17,396	4,900	845	1,293	3,012	17,146
1980	15,116	3,804	916	1,680	2,572	13,752
1981	13,926	1,684	1,077	1,628	2,188	10,717
1982	22,766	2,752	1,101	1,756	3,576	19,085
1983	13,565	134	1,195	1,239	1,980	9,285
1984	28,662	230	1,296	1,737	4,179	21,680
Annual growth rates (%):						
1970-84	9.1					2.6
1970/71 -1983/84	7.0					2.0
1970/72 -1982/84	7.5					3.1

Notes: 1) Seed use is based on a ratio of 1.275 qq/manzana.
2) Losses are calculated at 5% on the farm (post-harvest) and 10% in marketing.
3) Production is expressed in milled rice equivalents.

Table 23. APPARENT CONSUMPTION OF SUGAR, 1970-84
(MT)

	Production	Imports	Exports	Apparent Consumption
1970	52,222	18	9,756	42,484
1971	60,620	53	9,975	50,698
1972	62,382	40	12,136	50,286
1973	59,931	9,860	86	69,704
1974	73,590	43	7,545	66,089
1975	78,225	5	25,583	52,647
1976	87,972	24	22,195	65,801
1977	104,487	23	48,090	56,420
1978	121,958	21	22,636	99,342
1979	160,167	9	55,138	105,002
1980	190,185	0	81,497	97,221
1981	205,824	0	82,812	107,630
1982	205,400	0	88,879	101,136
1983	214,872	0	100,762	115,340
1984	224,488	0	97,416	118,548
Annual growth rates (%):				
1970-84	11.0		17.9	7.6

Source: Secretaría de Economía y Comercio.

Table 24. APPARENT CONSUMPTION OF BANANAS AND PLANTAINS, 1970-84
(MT)

	Bananas				Plantains			
	Production	Net Exports	Losses	Apparent Consumption	Production	Net Exports	Losses	Apparent Consumption
1970	1,248,591	799,187	22,470	426,934	83,046	13,176	3,494	66,377
1971	1,529,318	1,048,068	24,063	457,188	87,727	15,433	3,615	68,679
1972	1,396,773	925,168	23,580	448,025	94,591	0	4,730	89,861
1973	1,373,046	898,719	23,716	450,611	102,455	26,203	3,813	72,439
1974	1,137,682	703,346	21,717	412,619	95,818	16,953	3,943	74,922
1975	787,682	363,115	21,228	403,339	83,182	648	4,127	78,407
1976	1,084,864	642,661	22,110	420,093	95,182	12,769	4,121	78,292
1977	1,222,818	761,700	23,056	438,062	93,909	9,428	4,224	80,257
1978	1,234,227	753,477	24,038	456,713	91,955	4,030	4,396	83,529
1979	1,465,227	956,286	25,447	483,494	93,682	2,099	4,579	87,004
1980	1,428,046	969,983	22,903	435,160	145,546	14,210	6,567	124,769
1981	1,361,818	787,521	28,715	545,582	151,364	14,005	6,868	130,491
1982	1,052,909	887,769	8,257	156,883	153,182	15,795	6,869	130,518
1983	876,909	683,924	9,649	183,336	162,364	15,932	7,322	139,110
1984	987,500	832,245	7,763	147,492	164,318	18,534	7,289	138,495
Annual growth rates (%):								
1970-84	-1.7	0.3		-7.3	5.0	2.5		5.4
1970/71 -1983/84	-2.8	-1.4		-6.8				

Note: Losses are calculated as 5% of the quantity production less net exports.
Sources: Production: Banco Central de Honduras.
Trade: Secretaría de Economia y Comercio.

Table 25. APPARENT CONSUMPTION OF POTATOES AND CASSAVA, 1970-84
(MT)

	Potatoes			Cassava		
	Production	Net Imports	Apparent Consumption	Production	Net Imports	Apparent Consumption
1970	3,731	2,927	6,658	28,341	11	28,352
1971	3,833	693	4,526	26,722	-1	26,721
1972	3,936	282	4,218	25,104	0	25,104
1973	4,038	-167	3,871	13,860	0	13,860
1974	3,752	-122	3,630	11,258	-16	11,242
1975	3,923	-7	3,916	10,213	-15	10,198
1976	4,102	1	4,103	9,265	9	9,274
1977	4,289	5	4,294	8,405	0	8,405
1978	4,484	-65	4,419	7,625	0	7,625
1979	5,835	-30	5,805	8,600	0	8,600
1980	6,323	1	6,324	7,193	0	7,193
1981	8,100	-97	8,003	7,086	0	7,086
1982	8,300	10	8,310	6,861	10	6,871
1983	8,900	-174	8,726	6,554	-57	6,497
1984	3,820	107	3,927	10,202	-36	10,166
Annual growth rates (%):						
1970/71 -1983/84	4.1		1.0	-8.8		-8.8

Sources: Secretaría de Economía y Comercio; Consejo Superior de Planificación Económica.

Table 26. APPARENT CONSUMPTION OF EGGS, 1970-84
(in millions)

	Production	Imports	Exports	Apparent Consumption
1970	123	13	0	136
1971	131	0	0	131
1972	166	2	0	168
1973	198	0	0	198
1974	180	0	0	180
1975	241	0	1	240
1976	266	0	0	266
1977	213	0	0	213
1978	241	0	0	241
1979	241	1	2	240
1980	194	27	0	221
1981	197	0	0	197
1982	226	2	0	228
1983	224	7	0	231
1984	234[e]	0[p]	0[p]	234
Annual growth rates (%):				
1970-84	4.7			4.0

Sources: 1) Production: Secretaría de Recursos Naturales, Encuesta Avícola, 1978; Censo Avícola Sector Moderno, 1981, 82, 83; estimations by the Departamento de Estudios Económicos, Banco Central de Honduras.
2) Trade: Secretaría de Economía y Comercio.

Table 27. APPARENT CONSUMPTION OF POULTRY MEAT, 1970-84
(MT)

	Production	Imports	Exports	Apparent Consumption
1970	3,236	32	19	3,249
1971	3,559	1	0	3,560
1972	4,274	1	0	4,275
1973	4,990	2	7	4,985
1974	4,955	1	14	4,942
1975	6,124	1	36	6,089
1976	5,867	1	2	5,866
1977	7,053	1	0	7,054
1978	9,269	2	1	9,270
1979	9,868	1	66	9,803
1980	9,379	4	0	9,383
1981	10,036	3	78	9,961
1982	12,386	13	0	12,399
1983	13,751	2	0	13,753
1984	15,375[e]	0[p]	0[p]	15,375
Annual growth rates (%):				
1970-84	11.8			11.7

Sources: 1) Production: Secretaría de Recursos Naturales, Encuesta Avícola, 1978; Censo Avícola Sector Moderno, 1981, 82, 83; estimations by the Departamento de Estudios Económicos, Banco Central de Honduras.
2) Trade: Secretaría de Economía y Comercio.

[e]Authors' estimate

[p]Preliminary

Table 28. APPARENT CONSUMPTION OF BEEF, 1970-84
(MT, carcass weight)

	Production	Exports	Imports	Inventory Change	Apparent Consumption
1970	46,907	14,641	57	9,624	22,699
1971	48,634	16,562	150	8,546	23,675
1972	50,330	20,665	431	5,414	24,682
1973	51,369	19,805	342	6,310	25,596
1974	43,174	12,972	132	3,670	26,665
1975	53,215	16,810	31	8,659	27,777
1976	55,109	20,740	68	5,500	28,938
1977	55,769	13,474	100	12,247	30,149
1978	55,774	16,017	31	8,381	31,408
1979	57,660	30,043	79	-4,589	32,284
1980	56,971	19,990	78	3,866	33,192
1981	59,230	23,447	106	1,710	34,134
1982	59,434	16,247	73	8,150	35,110
1983	60,951	15,778	27	8,750	36,450
1984	62,535[p]	10,749[p]	67[p]	14,004[p]	37,849[p]
Annual growth rates (%):					
1970-84	2.1	-2.2			3.7
1970/71 -1983/84	2.0	-1.2			3.7

Source: Banco Central de Honduras.

Table 29. APPARENT CONSUMPTION OF MILK AND MILK PRODUCTS
(in thousand liters of fluid milk equivalent)

	Production	Net Imports	Apparent Consumption
1970	177,776	29,500	207,276
1971	184,451	24,000	208,451
1972	190,379	20,500	210,879
1973	194,112	20,800	214,912
1974	198,463	25,100	223,563
1975	206,679	20,700	227,379
1976	213,794	33,500	247,294
1977	218,917	49,900	268,817
1978	228,963	52,800	281,763
1979	236,871	64,100	300,971
1980	235,839	78,400	314,239
1981	241,238	73,400	314,638
1982	245,560	58,800	304,360
1983	254,926	77,100	332,026
1984	265,386	71,700	337,086
Annual growth rates (%):			
1970-84	2.9	6.6	3.5

Source: Rubén D. Núñez, "Análisis de la Producción, Industrialización y Comercio de la Leche en Honduras," Tegucigalpa, D.C., Septiembre, 1985.

Table 30. APPARENT CONSUMPTION OF PORK, 1970-84
(MT of carcass weight)

	Production = Apparent Consumption
1970	10,240
1971	10,383
1972	10,549
1973	9,353
1974	8,562
1975	8,445
1976	9,246
1977	8,232
1978	9,062
1979	9,518
1980	9,794
1981	11,985
1982	10,612
1983	8,634
1984	
Annual growth rates (%):	
1970/71 - 1982/83	-0.6

Table 31. APPARENT CONSUMPTION OF TOMATOES
(MT)

	Production	Net Exports	Losses	Apparent Consumption
1970	5,626	-175	870	4,931
1971	6,632	5	995	5,632
1972	7,739	0	1,161	6,578
1973	7,081	408	1,062	5,611
1974	9,651	497	1,448	7,706
1975	9,640	312	1,446	7,382
1976	9,777	363	1,467	7,947
1977	11,488	486	1,723	9,279
1978	13,499	1,105	2,025	10,369
1979	14,285	8,829	2,143	3,313
1980	28,055	664	4,208	23,183
1981	35,200	2,823	5,280	27,097
1982	33,700	535	5,055	28,110
1983	43,344	58	6,502	36,784
1984	50,715	25	7,607	43,083
Annual Growth Rates (%):				
1970-84	17.0			16.7

Note: Losses are calculated at 15%, on the basis of FAO information.

Source: Secretaría de Economía y Comercio.

Table 32. PER CAPITA APPARENT CONSUMPTION OF MAJOR FOODS, 1970-84
(gr./person/day)

Year	Corn[1]	Beans	Whole Wheat[2]	Milled Rice[3]	Sugar	Beef	Milk, Cheese, Butter[4]	Poultry	Eggs[5]	Pork	Vegetable Oils[2]	Bananas	Plantains	Potatoes	Cassava	Tomatoes
1970	212.7 (228.3)	30.2 (32.7)	49.3	16.2 (17.5)	44.1	25.6	0.22	3.4	0.14 (0.29)	10.6	2.6	443.2	68.9	6.9	29.4	5.1
1971	215.3	24.2	49.9	9.5	51.1	23.8	0.21	3.6	0.13	10.5	3.0	460.6	69.2	4.6	26.9	5.7
1972	210.3	22.4	47.9	11.1	49.1	24.1	0.22	4.2	0.16	10.3	3.9	437.5	87.8	4.1	24.5	6.4
1973	202.8	29.3	44.9	7.8	66.0	24.2	0.21	4.7	0.19	8.9	4.3	426.4	68.5	3.7	13.1	5.3
1974	205.1	11.5	42.6	9.7	60.5	24.4	0.22	4.5	0.16	7.8	8.7	377.9	68.6	3.3	10.3	7.1
1975	237.1	21.8	45.6	17.9	46.6	24.6	0.21	5.4	0.21	7.5	11.1	357.2	69.4	3.5	9.0	7.0
1976	189.0	22.3	45.8	15.3	56.3	24.8	0.22	5.0	0.23	7.9	10.3	359.4	67.0	3.5	7.9	6.8
1977	185.4	19.8	48.7	15.8	46.6	24.9	0.23	5.8	0.18	6.9	11.6	361.7	66.3	3.5	6.9	7.7
1978	197.8	19.9	55.0	10.8	79.1	25.0	0.24	7.4	0.19	7.2	11.2	363.8	66.5	3.5	6.1	8.3
1979	302.3	29.2	57.7	13.8	80.7	24.8	0.24	7.5	0.18	7.3	10.0	371.7	66.9	4.5	6.6	2.5
1980	158.8	19.8	57.5	10.9	72.2	24.6	0.25	7.0	0.16	7.3	18.2	323.0	92.6	4.7	5.3	17.2
1981	179.8	19.8	59.9	8.5	77.2	24.5	0.24	7.1	0.14	8.6	19.0	391.2	93.6	5.7	5.1	19.4
1982	220.0	23.3	65.4	14.0	70.1	24.3	0.22	8.6	0.16	7.4	18.4	108.7	90.4	5.8	4.8	19.5
1983	157.2	18.7	57.9	7.0	77.2	24.4	0.23	9.2	0.15	5.8	17.4	122.7	93.1	5.8	4.3	24.6
1984	163.7 (215.3)	15.2 (23.1)	52.4	14.0 (28.4)	79.0	24.5	0.22	10.0	0.15 (0.34)	7.3	17.2	95.5	89.7	2.5	6.6	27.9
Averages:																
1970-71	214.5	27.2	49.6	12.8	47.6	23.7	0.22	3.5	0.14	10.6	2.8	451.9	69.1	5.8	28.2	5.4
1983-84	160.5	17.0	55.2	10.5	78.1	24.5	0.23	9.6	0.15	6.6	17.3	109.1	91.4	4.2	5.5	26.3
1970-72	213.1	25.6	49.0	12.2	48.1	23.7	0.22	3.7	0.14	10.5	3.2	447.1	75.3	5.2	26.9	5.7
1982-84	180.3	19.1	57.9	11.7	75.4	24.4	0.22	9.3	0.15	6.8	17.7	109.0	91.1	4.7	5.2	24.0
Changes (grams/person/day):																
1970-84 1970/71	-50.0	-15.0	+ 3.1	- 2.2	+34.9	+ 0.9	0.0	+6.6	0.1	- 3.3	14.6	-347.7	20.8	-4.5	-22.8	22.8
-1983/84 1970/72	-54.0	-10.2	+ 5.6	- 2.3	+30.5	+ 0.8	+0.1	+6.1	0.1	- 4.0	14.5	-342.8	22.3	-1.6	-22.7	20.9
-1982/84	-32.8	- 6.5	+ 8.9	- 0.5	+27.3	+ 0.6	0.0	+5.6	0.1	- 3.7	14.5	-338.1	15.8	-0.5	-21.7	18.3

Notes: The figures in parentheses are based on an alternative calculation, using production data from the Banco Central de Honduras.
1) For corn, the apparent consumption includes 5% of the "industrialized corn."
2) Series provided by the Foreign Agricultural Service of the U.S. Department of Agriculture.
3) For rice, the apparent consumption includes all of the "industrialized rice."
4) In fluid milk equivalent.
5) In eggs rather than grams.

Sources: Tables 20 to 31.

Table 33. APPARENT PER CAPITA DAILY CONSUMPTION OF CALORIES, BY MAJOR FOODS, 1970-72 and 1982-84
(calories/person/day)

Year	Corn	Beans	Wheat	Rice	Sugar	Beef	Dairy products	Poultry	Eggs	Pork	Vegetable oils	Animal fats	Bananas	Plantains	Potatoes	Cassava	Tomatoes	Total[3]
1970	769.3	101.7	180.8	59.0	169.1	26.1	0.1	5.8	0.2	28.7	23.1	79.0[1]	427.7	84.0	5.3	43.5	1.1	2000.2
	(821.9)			(63.7)					(0.4)									
1971	775.1	81.5	183.0	33.8	195.9	26.3	0.1	6.1	0.2	28.4	26.7	75.0[1]	444.5	84.4	3.5	39.8	1.3	2005.6
1972	757.1	75.4	175.6	40.4	188.2	26.6	0.1	7.1	0.2	27.9	34.7	75.0[1]	422.2	107.0	3.1	36.3	1.4	1978.3
1982	792.0	78.4	232.5	50.9	268.7	26.9	0.1	14.6	0.2	20.0	163.6	54.5[2]	104.9	110.2	4.4	7.1	4.3	1933.3
1983	565.9	65.0	212.3	25.5	295.9	27.0	0.1	15.6	0.2	15.7	154.7	42.8[2]	118.4	113.5	4.4	6.4	5.4	1666.8
1984	589.3	51.2	192.1	50.9	302.8	27.1	0.1	17.0	0.2	19.8	152.9	54.0	92.2	109.3	1.9	9.8	6.2	1676.8
	(775.1)	(77.8)		(105.4)					(0.5)									
Averages:																		
1970-72	767.2	86.2	179.8	26.7	184.4	26.3	0.1	6.3	0.2	28.3	28.2	76.3	431.5	91.8	4.0	39.9	1.3	1994.7
1982-84	649.1	64.2	212.3	42.4	289.1	27.0	0.1	15.7	0.2	18.5	157.1	50.4	105.2	111.0	3.6	7.8	5.3	1759.0
Increments:																		
1970-72 to 1982-84	-118.1	-22.0	32.5	15.7	104.7	0.7	0.0	9.4	0.0	- 9.8	128.9	-25.9	-326.3	19.2	-0.4	-32.1	4.0	- 235.7
Growth rates (%):																		
1970-72 to 1982-84	- 1.4	- 2.4	1.4	5.9	5.8	0.2	0.0	7.9	0.0	- 3.5	15.4	- 3.4	- 11.1	1.6	-0.9	-12.7	12.4	- 1.0

Source: Calculated from Table 32 on the basis of the nutrition factors for Central America reported in Flores, Menchú and Lara (1971).

1/ FAO data. 2/ Authors' estimates.

3/ The totals are based only on the products shown in the table. A source of error is the probable underestimate of wastage in several products. Another source is errors in the original time series on national production and trade. In general, these totals are not as accurate as those based on the household survey, reported in Table 35. The main usefulness of this table lies in showing the approximate time trends and the sources of change over time.

Table 34. APPARENT PER CAPITA CONSUMPTION OF PROTEINS, BY MAJOR FOOD, 1970-72 and 1980-84
(grams of protein/person/day)

Year	Corn	Beans	Wheat	Rice	Sugar	Beef	Dairy products	Poultry	Eggs	Pork	Vegetable oils	Animal fats	Bananas	Plantain	Potatoes	Cassava	Tomatoes	Total
1970	19.9	6.6	5.8	1.2	0.0	5.1	0.01	0.6	0.02	1.4	0.0	0.0	5.2	0.7	0.1	0.2	0.05	46.9
	(21.3)	(7.2)		(1.5)					(0.03)									
1971	20.1	5.5	5.8	0.7	0.0	5.1	0.01	0.6	0.02	1.4	0.0	0.0	5.4	0.7	0.1	0.2	0.04	45.5
1972	19.6	4.9	5.6	0.8	0.0	5.2	0.01	0.8	0.02	1.3	0.0	0.0	5.1	0.9	0.1	0.2	0.04	44.6
1982	20.5	5.1	7.4	1.0	0.0	5.2	0.01	1.5	0.02	1.0	0.0	0.0	1.3	0.9	0.1	0.04	0.1	44.2
1983	14.7	4.1	6.8	0.5	0.0	5.3	0.01	1.7	0.02	0.7	0.0	0.0	1.4	0.9	0.1	0.03	0.2	36.5
1984	15.3	3.3	6.1	1.0	0.0	5.3	0.01	1.8	0.02	0.9	0.0	0.0	1.1	0.9	0.05	0.05	0.2	36.0
	(20.1)	(5.1)		(2.0)														
Averages:																		
1970-72	19.9	5.6	5.7	0.9	0.0	5.1	0.01	0.7	0.02	1.4	0.0	0.0	5.2	0.8	0.1	0.2	0.04	45.7
1982-84	16.8	4.2	6.8	0.8	0.0	5.3	0.01	1.7	0.02	0.9	0.0	0.0	1.3	0.9	0.08	0.04	0.2	38.9
Increments:																		
1970-72 to 1982-84	-3.1	-1.4	1.1	-0.1	0.0	0.2	0.0	1.0	0.0	-0.5	0.0	0.0	-3.9	0.1	-0.02	-0.16	0.16	-6.8

Source: Calculated from Table 32 on the basis of the nutrition factors for Central America reported in Flores, Menchu and Lara (1971)
(See note 3 to Table 33.)

Table 35. CONSUMPTION OF CALORIES AND PROTEINS
(in calories and grams of protein per person per day)

Household income stratum: lempiras/month	Calories	Proteins	Cost in lempiras per 1000 calories	Number of products	Population 1978-79
		Principal Cities			
Less than 100	1,692	48	0.27	79	6,104
100 to 300	2,142	59	0.51	159	121,032
300 to 500	2,209	64	0.63	165	190,107
500 to 1000	2,298	63	0.79	174	254,364
1000 and over	2,520	85	1.34	174	192,402
All principal cities	2,302	68	0.89	186	764,010
		Other Urban Areas			
Less than 100	1,625	45	0.33	73	25,598
100 to 300	1,953	55	0.44	143	178,500
300 to 500	2,004	59	0.60	148	129,417
500 to 1000	2,299	70	0.75	152	99,968
1000 and over	2,605	82	1.17	140	32,556
All other urban areas	2,069	61	0.63	172	466,039
		Rural Areas			
Less than 100	1,564	40	0.26	56	418,799
100 to 300	1,697	44	0.38	94	1,508,970
300 to 500	1,976	53	0.50	94	270,924
500 to 1000	2,025	52	0.65	63	57,927
1000 and over	1,957	59	1.49	36	14,751
All rural areas	1,716	45	0.40	112	2,271,371
ALL HONDURAS	1,891	52	0.54	186	3,501,420

Note: Subtotals and the total are weighted by total population in each stratum, not by sampling populations.

Source: Analysis by ADAI, based on the 1978-79 Household Survey of the Secretaria de Economía y Comercio.

Table 36. DISTRIBUTION OF POPULATION, INCOME AND NUTRITION (percent)

	Household income stratum (lempiras/month)				
	Less than 100	100 to 300	300 to 500	500 to 1000	1000 and over
Principal Cities					
Households	1.1	19.9	25.3	30.6	23.1
Population	0.8	16.0	24.8	33.2	25.1
Monthly income	0.1	5.0	11.5	25.2	58.2
Calorie consumption	0.6	14.7	23.9	33.2	27.6
Protein consumption	0.6	13.8	23.4	30.8	31.4
Other Urban Areas					
Households	8.6	41.9	24.7	18.8	6.0
Population	5.6	38.3	27.7	21.4	6.9
Monthly income	1.5	19.4	22.7	30.8	25.6
Calorie consumption	4.3	36.2	26.9	23.8	8.8
Protein consumption	4.1	34.7	27.0	24.8	9.4
Rural Areas					
Households	23.6	63.8	9.9	2.1	0.6
Population	18.5	66.3	12.0	2.6	0.6
Monthly income	9.5	57.9	20.4	7.7	4.5
Caloric consumption	16.8	65.7	13.7	3.0	0.7
Protein consumption	16.5	65.5	14.2	3.0	0.9

Note: Each row sums to 100%, subject to rounding errors.

Source: Analysis by the authors, based on table 35 and other information from the Household Survey of the Dirección General de Estadística y Censos, Secretaría de Economía y Comercio.

Table 37. SOURCES OF NUTRITION BY TYPE OF FOOD AND BY INCOME STRATUM, PRINCIPAL CITIES 1978-79

Household income group (lempiras/month)	Corn	Beans	Rice	Wheat	Sorghum	Beef	Fish	Pork	Poultry	Eggs	Milk	Cheese	Animal fats	Sugar	Plantains	Other fruit	Vegetables	Root crops	Others	Total
									Calories/person/day											
Less than 100	809	152	88	108	3	22	1	7	1	22	42	51	125	155	36	8	7	9	44	1692
100 to 300	863	160	147	139	3	28	3	25	10	28	57	72	221	240	51	11	8	14	62	2142
300 to 500	714	147	164	169	4	43	4	40	22	32	79	89	256	260	63	15	12	18	78	2209
500 to 1000	582	136	167	213	8	53	6	58	32	40	107	106	280	266	73	27	17	24	104	2298
1000 and over	353	117	167	270	1	73	9	86	53	53	143	128	295	336	89	64	27	34	238	2520
All principal cities	599	138	162	204	4	51	6	55	31	39	101	102	267	277	70	31	17	23	124	2301
									Grams of protein/person/day											
Less than 100	18	10	2	4	0	4	0	0	0	2	2	2	0	0	1	0	0	0	2	48
100 to 300	20	10	3	5	0	5	1	1	1	2	3	4	0	0	1	0	0	0	3	59
300 to 500	16	10	3	6	0	8	1	2	2	2	4	4	0	0	1	0	1	0	4	64
500 to 1000	13	1	3	8	0	10	1	3	3	3	6	5	0	0	1	0	1	0	5	63
1000 and over	8	8	3	10	0	13	1	4	5	4	7	5	0	0	1	1	1	1	12	85
All principal cities	14	9	3	8	0	9	1	3	3	3	5	5	0	0	1	0	1	0	6	71

Notes: Totals are weighted by sampling populations in each stratum. Protein ingestion of less than 0.5 grams is listed as zero.

Source: Calculated by ADAI, on the basis of information from the 1978-79 Household Survey of the Secretaría de Economía y Comercio.

Table 38. SOURCES OF NUTRITION BY TYPE OF FOOD AND BY INCOME STRATUM, ALL OTHER URBAN AREAS 1978-79

Household income group (lempiras/month)	Corn	Beans	Rice	Wheat	Sorghum	Beef	Fish	Pork	Poultry	Eggs	Milk	Cheese	Animal fats	Sugar	Plantains	Other fruit	Vegetables	Root crops	Others	Total
									Calories/person/day											
Less than 100	1033	194	45	29	0	4	2	5	2	7	23	31	70	129	12	2	2	5	33	1625
100 to 300	949	210	99	71	3	19	2	19	4	15	44	59	156	212	25	6	6	10	43	1953
300 to 500	756	176	129	112	4	32	5	37	11	20	66	87	187	230	45	12	8	20	68	2004
500 to 1000	768	174	141	145	6	50	6	55	19	27	76	121	237	255	70	21	11	29	90	2299
1000 and over	596	179	195	215	0	68	7	77	27	35	103	143	333	296	89	35	20	28	157	2605
All other urban areas	864	204	120	106	3	29	4	35	11	20	60	84	190	228	44	13	9	17	67	2108
									Grams of protein/person/day											
Less than 100	23	13	1	1	0	1	0	0	0	1	1	2	0	0	0	0	0	0	1	45
100 to 300	21	14	2	3	0	4	0	1	0	1	2	3	0	0	0	0	0	0	2	55
300 to 500	17	11	3	4	0	6	1	2	1	2	3	4	0	0	1	0	0	0	3	59
500 to 1000	17	11	3	5	0	9	1	3	2	2	4	6	0	0	1	0	0	0	4	70
1000 and over	13	12	4	8	0	12	1	4	2	3	5	7	0	0	1	1	1	0	8	82
All other urban areas	20	13	2	4	0	5	1	2	1	2	3	4	0	0	1	0	0	0	3	61

Notes: Totals are weighted by sampling populations in each stratum. Protein ingestion of less than 0.5 grams listed as zero.

Source: Calculated by ADAI, on the basis of information from the 1978-79 Household Survey of the Secretaría de Economía y Comercio.

Table 39. SOURCES OF NUTRITION BY TYPE OF FOOD AND BY INCOME STRATUM, RURAL AREAS 1978-79

Household income group (lempiras/month)	Corn	Beans	Rice	Wheat	Sorghum	Beef	Fish	Pork	Poultry	Eggs	Milk	Cheese	Animal fats	Sugar	Plantains	Other fruit	Vegetables	Root crops	Others	Total
										Calories/person/day										
Less than 100	876	213	67	10	13	3	0	5	0	12	6	6	93	208	10	0	1	3	37	1564
100 to 300	816	180	129	38	17	11	3	13	2	21	16	24	171	186	24	2	4	7	34	1697
300 to 500	720	153	168	99	58	24	3	33	6	26	47	64	239	227	41	5	7	11	45	1976
500 to 1000	643	127	161	79	0	24	6	14	8	25	86	110	231	375	68	5	9	12	42	2025
1000 and over	601	205	115	77	0	34	6	77	0	55	63	65	262	250	67	17	1	1	60	1957
All rural areas	810	183	123	41	20	11	2	14	2	21	20	28	167	179	25	3	4	7	43	1703
										Grams of protein/person/day										
Less than 100	20	14	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	2	40
100 to 300	18	12	3	1	0	2	1	1	0	2	1	1	0	0	0	0	0	0	2	44
300 to 500	16	10	3	3	1	5	1	2	1	2	2	3	0	0	1	0	0	0	2	53
500 to 1000	15	8	3	3	0	5	1	1	1	2	4	7	0	0	1	0	0	0	2	52
1000 and over	14	13	2	3	0	6	2	4	0	4	3	3	0	0	2	0	0	0	3	59
All rural areas	18	12	2	1	0	2	1	1	0	2	1	2	0	0	0	0	0	0	2	45

Notes: Totals are weighted by sampling population in each stratum. Protein ingestion of less than 0.5 grams is listed as zero.

Source: Calculated by ADAI, on the basis of information from the 1978-79 Household Survey of the Secretaría de Economía y Comercio.

Table 40. PROPORTIONS OF HOUSEHOLD CONSUMPTION DERIVING FROM OWN PRODUCTION, 1978-79
(%)

Income Stratum (Lempiras/month)	Number of Households	Corn	Beans	Rice	Milk	Eggs
		Rural Areas				
Less than 100	253	64.6	37.3	6.8	57.1	78.4
100 to 300	682	73.2	38.6	5.4	37.5	79.0
300 to 500	106	49.6	40.8	5.6	29.0	46.0
500 to 1000	22	61.1	13.0	2.9	59.0	73.8
More than 1000	6	49.6	62.1	0.0	70.0	50.9
Total	1069	63.9	29.8	3.8	38.0	73.8
		Farm Households				
Less than 100	190	69.2	40.4	3.8	71.4	82.2
100 to 300	502	79.0	43.8	7.6	53.3	82.9
300 to 500	53	74.5	55.3	8.3	54.5	50.7
500 to 1000	12	72.8	12.2	0.0	80.5	82.4
More than 1000	3	78.3	100.0	0.0	100.0	88.4
Total	760	72.0	34.8	3.9	45.0	78.7

Note: Sharecroppers and other hired agricultural laborers are not included among farm households.

Source: Ministry of Economy and Trade, Household Survey, 1978-79.

Table 41. INCOME AND AVERAGE EXPENDITURE PROPENSITIES, BY STRATUM, 1978-79

Income Stratum (lempiras/month)	Family Size	Monthly Household Income (lempiras/mo.)	Average Expenditure Propensities on: Food	Beverages & Tobacco	Housing	Others
		Principal Cities				
Less than 100	4.3	79.5	.656	.097	.201	.046
100 to 300	4.6	215.9	.620	.079	.157	.144
300 to 500	5.7	387.4	.543	.069	.180	.208
500 to 1000	6.3	701.9	.433	.055	.218	.294
More than 1000	6.3	2148.8	.262	.034	.274	.430
Average	5.8	853.6	.371	.048	.238	.343
		Other Urban Areas				
Less than 100	3.6	73.2	.700	.094	.160	.046
100 to 300	5.2	191.5	.625	.076	.157	.142
300 to 500	6.4	381.5	.549	.060	.171	.220
500 to 1000	6.5	679.5	.440	.056	.184	.320
More than 1000	6.6	1771.7	.307	.033	.192	.468
Average	5.7	414.7	.483	.057	.176	.284
		Rural Areas				
Less than 100	4.6	72.5	.673	.106	.143	.078
100 to 300	6.1	163.8	.635	.084	.103	.178
300 to 500	7.1	371.1	.518	.054	.105	.323
500 to 1000	7.3	677.0	.377	.049	.170	.404
More than 1000	6.8	1443.0	.379	.034	.081	.506
Average	5.9	180.5	.594	.077	.111	.218

Note: Expenditures include the implicit expenditures on retained home production.

Source: García (1982).

Table 42. AVERAGE WHOLESALE PRICES OF BASIC GRAINS IN CENTRAL AMERICA, 1975-83
(in Central American pesos per cwt.)

Country and Product	1975	1976	1977	1978	1979	1980	1981	1982
Guatemala								
White corn	7.40	6.34	7.56	8.10	8.10	10.40	10.68	8.69
Red beans	17.37	16.36	23.12	26.60	22.30	31.68	37.69	24.03
No. 2 rice	18.12	16.59	21.29	21.14	21.41	24.32	27.08	26.29
Sorghum	8.08	5.70	6.88	6.80	7.43	9.74	10.07	8.34
El Salvador								
White corn	7.07	6.47	8.70	9.84	7.17	8.19	9.58	9.25
Red beans	19.49	19.03	24.57	26.58	20.17	36.91	41.60	31.74
No. 2 rice	16.89	14.63	19.97	21.22	20.20	20.73	22.43	23.07
Sorghum	6.05	4.59	7.73	6.61	6.41	7.34	7.54	8.31
Honduras								
White corn	8.35	5.53	9.06	8.05	7.83	10.14	9.76	9.07
Red beans	13.84	14.05	17.76	19.45	18.33	35.71	33.01	22.50
No. 2 rice	20.56	20.48	22.08	25.78	29.87	31.60	33.18	35.79
Sorghum	7.70	5.40	10.50	8.23	7.50	10.17	8.96	8.82
Nicaragua								
White corn	11.48	7.14	10.54	9.13	6.82	10.92	12.08	10.97
Red beans	19.16	16.98	24.12	23.60	21.32	33.12	39.06	36.05
No. 2 rice	16.33	12.92	15.31	19.12	19.27	23.06	29.28	27.00
Sorghum	11.06	6.26	8.04	8.10	n.a.	10.68	10.54	10.15
Costa Rica								
White corn	9.21	8.35	8.80	10.30	11.20	12.30	8.35	9.78
Red beans	27.10	25.09	28.00	26.80	n.a.	n.a.	15.50	22.76
No. 2 rice	15.40	15.27	14.60	17.70	n.a.	n.a.	12.39	n.a.
Sorghum	7.60	7.60	7.60	8.20	9.30	10.60	6.60	8.37

Notes: The wholesale prices reported here are the prices received by marketing agents that deliver the products to the major grain markets in the capital cities. The 1975 prices are July-December averages.

Source: SIECA.

Table 43. CONSUMER PRICE INDEXES, FOR AGRICULTURE AND IN THE AGGREGATE 1970-1985

Year	Agricultural Indexes Without Wheat	With Wheat	Aggregate Index 1970 =100	1975 =100
1970	1.000		1.000	0.745
1971	0.981		1.021	0.761
1972	1.049		1.053	0.785
1973	1.180		1.102	0.821
1974	1.381		1.242	0.925
1975	1.591	1.000	1.342	1.000
1976	1.483	0.955	1.410	1.051
1977	1.802	1.115	1.528	1.138
1978	1.966	1.168	1.616	1.203
1979	2.121	1.259	1.812	1.349
1980	2.622	1.531	2.140	1.593
1981	2.709	1.609	2.340	1.742
1982	2.783	1.627	2.550	1.898
1983	3.040	1.743	2.762	2.056
1984	2.813	1.646	2.891	2.152
1985	2.942	1.677	2.988	2.224
Rates of change (%):				
1970-78	8.8	n.a.	6.2	6.2
1970-85	7.5	n.a.	7.6	7.6
1975-85	6.3	5.3	8.3	8.3
1978-85	5.9	5.3	9.2	9.2

Notes: The agricultural indexes were constructed by the authors, based on 13 principal products in addition to wheat (see text). The two aggregate indexes are the same, except that they are expressed in terms of different base years.

Source: Secretaría de Economía y Comercio.

Table 44. CONSUMER PRICES OF PRINCIPAL FOODS, 1970-1986
(in lempiras per unit indicated)

Year	Grain Corn (lb.)	Red Beans (lb.)	No. 2 Rice (lb.)	Wheat Flour (lb.)	Chicken (lb.)	Fresh Tomato (lb.)	Fresh Milk (bottle)	Bananas (each)	Beef (lb.)	Pork Chops (lb.)	Medium Eggs (dozen)	Medium Potatoes (lb.)	Red Onions (lb.)	Cabbage (lb.)
1970	0.09	0.25	0.25	n.a.	0.99	0.28	0.24	0.02	0.84	0.96	1.13	0.24	0.41	0.24
1971	0.07	0.20	0.32	n.a.	1.02	0.29	0.25	0.02	0.92	1.03	1.10	0.28	0.46	0.25
1972	0.09	0.21	0.33	n.a.	0.99	0.33	0.25	0.02	0.95	1.04	1.14	0.24	0.44	0.27
1973	0.10	0.33	0.30	n.a.	1.07	0.32	0.27	0.02	1.09	1.14	1.15	0.30	0.39	0.28
1974	0.12	0.33	0.39	n.a.	1.25	0.32	0.32	0.02	1.34	1.41	1.31	0.36	0.41	0.26
1975	0.18	0.34	0.48	0.38	1.28	0.33	0.33	0.02	1.31	1.51	1.31	0.34	0.52	0.31
1976	0.13	0.35	0.49	0.38	1.28	0.37	0.35	0.02	1.35	1.56	1.38	0.37	0.58	0.37
1977	0.21	0.44	0.59	0.38	1.32	0.44	0.34	0.02	1.52	1.70	1.42	0.38	0.70	0.35
1978	0.20	0.54	0.63	0.38	1.35	0.43	0.38	0.03	1.70	1.79	1.45	0.36	0.73	0.34
1979	0.20	0.54	0.66	0.38	1.40	0.52	0.40	0.03	2.05	1.95	1.52	0.47	0.84	0.41
1980	0.26	0.90	0.71	0.44	1.49	0.65	0.49	0.04	2.31	2.13	1.86	0.56	0.91	0.51
1981	0.22	0.81	0.76	0.475	1.61	0.66	0.57	0.04	2.70	2.69	1.88	0.59	0.95	0.48
1982	0.22	0.62	0.88	0.50	1.69	0.56	0.61	0.05	2.85	3.00	1.93	0.54	1.11	0.40
1983	0.27	0.66	0.93	0.50	1.84	0.56	0.60	0.06	2.93	3.03	2.02	0.58	1.05	0.45
1984	0.19	0.67	0.85	0.50	1.89	0.55	0.61	0.06	2.95	3.08	1.92	0.56	1.35	0.39
1985	0.21	0.74	0.84	0.50	1.90	0.46	0.64	0.07	2.99	3.09	1.87	0.50	1.13	0.30
1986	0.26	0.70	0.85	0.50	2.13	0.48	0.66	0.07	3.01	3.12	2.01	0.64	1.21	0.36

Note: The cut of beef used here is "tajo de pierna de res."

Sources: Wheat, Secretaría de Economía y Comercio; other products, Banco Central de Honduras, Depto. de Estudios Económicos.

Table 45. REAL CONSUMER PRICES OF PRINCIPAL FOODS, 1970-1986
(in lempiras per unit indicated, at constant 1978 prices)

Year	Grain Corn (lb.)	Red Beans (lb.)	No. 2 Rice (lb.)	Wheat Flour (lb.)	Chicken (lb.)	Fresh Tomato (lb.)	Fresh Milk (bottle)	Bananas (each)	Beef (lb.)	Pork Chops (lb.)	Medium Eggs (dozen)	Medium Potatoes (lb.)	Red Onions (lb.)	Cabbage (lb.)
1970	0.15	0.40	0.40	n.a.	1.60	0.45	0.39	0.03	1.36	1.55	1.83	0.39	0.66	0.39
1971	0.11	0.32	0.51	n.a.	1.61	0.46	0.40	0.03	1.46	1.63	1.74	0.44	0.73	0.40
1972	0.14	0.32	0.51	n.a.	1.52	0.51	0.38	0.03	1.46	1.60	1.75	0.37	0.67	0.41
1973	0.15	0.48	0.44	n.a.	1.57	0.47	0.68	0.03	1.60	1.67	1.69	0.44	0.57	0.41
1974	0.16	0.43	0.51	n.a.	1.63	0.42	0.42	0.03	1.74	1.83	1.70	0.47	0.53	0.34
1975	0.22	0.41	0.58	0.46	1.54	0.40	0.40	0.02	1.58	1.82	1.58	0.41	0.63	0.37
1976	0.15	0.40	0.56	0.44	1.47	0.42	0.40	0.02	1 55	1.79	1.58	0.42	0.66	0.42
1977	0.22	0.47	0.57	0.40	1.40	0.47	0.36	0.02	1.61	1.80	1.50	0.40	0.74	0.37
1978	0.20	0.54	0.63	0.38	1.35	0.43	0.38	0.03	1.70	1.79	1.45	0.36	0.73	0.34
1979	0.18	0.48	0.59	0.34	1.25	0.46	0.36	0.03	1.83	1.74	1.36	0.42	0.75	0.37
1980	0.20	0.68	0.54	0.33	1.13	0.49	0.37	0.03	1.74	1.61	1.40	0.42	0.69	0.39
1981	0.15	0.56	0.52	0.33	1.11	0.46	0.39	0.03	1.86	1.86	1.30	0.41	0.66	0.33
1982	0.14	0.39	0.56	0.32	1.07	0.35	0.39	0.03	1.81	1.90	1.22	0.34	0.70	0.25
1983	0.16	0.39	0.54	0.29	1.08	0.33	0.35	0.04	1.71	1.77	1.18	0.34	0.61	0.26
1984	0.11	0.37	0.48	0.28	1.06	0.31	0.34	0.03	1.65	1.72	1.07	0.31	0.75	0.22
1985	0.11	0.40	0.45	0.27	1.03	0.25	0.35	0.04	1.62	1.67	1.01	0.27	0.61	0.16
1986	0.13	0.36	0.44	0.26	1.10	0.25	0.34	0.04	1.56	1.62	1.04	0.33	0.63	0.19

Notes: 1) The cut of beef used here is "tajo de pierna de res."
2) The consumer price index is used for the deflation.

Sources: Tables 43 and 44.

Table 46. INDEXES OF THE CONSUMER PRICE OF WHEAT FLOUR, RELATIVE TO OTHER CONSUMER PRICES

	Price of Wheat Relative to the Price of:							
	Corn	Beans	Rice	Chicken	Beef	Milk	Eggs	Potatoes
1975	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1976	1.38	0.97	0.98	1.00	0.97	0.94	0.95	0.92
1977	0.86	0.77	0.89	0.97	0.86	0.97	0.92	0.89
1978	0.90	0.63	0.76	0.95	0.77	0.87	0.90	0.94
1979	0.90	0.63	0.73	0.91	0.64	0.83	0.86	0.72
1980	0.80	0.44	0.78	0.99	0.66	0.78	0.82	0.70
1981	1.02	0.52	0.79	0.99	0.61	0.72	0.87	0.72
1982	1.08	0.72	0.72	1.00	0.60	0.71	0.89	0.83
1983	0.88	0.68	0.68	0.92	0.59	0.72	0.85	0.77
1984	1.25	0.67	0.74	0.89	0.58	0.71	0.90	0.80
1985	1.13	0.60	0.75	0.89	0.58	0.68	0.92	0.89

Note: Each index is calculated as the ratio of the wheat price to the price of the other good, normalized so that it's value =1.00 in 1975.

Source: Table 44

Table 47. FARMGATE PRICES OF PRINCIPAL AGRICULTURAL PRODUCTS 1970-1983 (lempiras/MT)

Year	Corn	Beans	Sorghum	Rice	Potatoes	Cassava	Onions	Tomatoes
1970	134	372	167	448	179	120	342	106
1971	136	369	167	493	281	120	341	106
1972	136	373	168	494	311	121	358	106
1973	152	396	169	495	330	122	385	107
1974	167	407	187	512	341	127	407	108
1975	211	455	216	534	343	129	440	109
1976	207	456	214	550	345	130	473	106
1977	242	505	236	649	363	132	506	110
1978	238	547	252	715	413	135	534	116
1979	231	550	259	787	440	138	567	124
1980	288	770	282	842	464	140	605	128
1981	277	695	312	905	491	142	645	132
1982	286	674	329	956	447	141	735	121
1983	343	715	352	1004	481	143	765	119

Year	Cabbage	Pineapple	Canta-loupe	Water-melon	Banana	Plantain	Coconut	Sugarcane
1970	185	186	154	154	63	78	121	12.8
1971	187	224	165	165	55	83	132	13.4
1972	193	211	154	154	67	88	127	14.5
1973	193	223	156	155	66	89	125	15.6
1974	194	226	157	156	73	94	127	16.9
1975	195	226	156	156	115	97	132	18.3
1976	195	229	178	158	120	106	135	18.5
1977	198	233	187	161	122	112	136	18.7
1978	220	249	196	154	127	122	138	18.7
1979	248	259	217	176	138	128	138	20.7
1980	260	266	231	181	141	148	140	27.1
1981	274	293	256	199	143	157	138	27.5
1982	241	299	225	203	181	165	140	28.2
1983	281	336	249	217	203	174	142	n.a.

(cont.)

Table 47. FARMGATE PRICES, cont.

Year	Cotton	Coffee	Palm Oil	Tobacco	Eggs[a]	Poultry	Fresh Milk[b]	Beef	Pork
1970	356	1666	61	1761	27.0	1679	0.22	899	1408
1971	374	1603	64	2618	26.3	1731	0.23	899	1452
1972	391	1532	61	2728	27.4	1681	0.23	913	1474
1973	473	1816	66	2596	27.7	1828	0.24	942	1518
1974	649	2204	70	2442	29.9	2197	0.26	1192	1694
1975	726	1793	84	2552	32.0	2253	0.28	1302	1738
1976	924	2609	86	2420	33.8	2253	0.31	1401	1782
1977	1122	5500	87	2684	34.9	2325	0.34	1611	1914
1978	954	4470	103	2530	37.1	2398	0.37	1751	1958
1979	1058	3502	99	2838	37.1	2521	0.40	1764	2024
1980	1091	3801	131	3410	44.3	2644	0.42	1848	2200
1981	1252	3166	152	3403	44.6	2834	0.43	1942	2354
1982	924	2493	177	3634	47.0	n.a.	0.43	1943	n.a.
1983	950	2282	187	3957	n.a.	n.a.	n.a.	n.a.	n.a.

[a]lempiras per box of 360 eggs. [b]lempiras per liter.

Source: Dirección General de Estadística y Censos, Secretaría de Economía y Comercio.

Note: The banana prices refer to sales on the domestic market; the price for export sales is considerably higher.

Table 48. DEFLATED FARMGATE PRICES FOR PRINCIPAL PRODUCTS 1970-1983

Year	Corn	Beans	Sorghum	Rice	Potatoes	Cassava	Onions	Tomatoes
1970	244	676	304	815	325	218	622	193
1971	243	659	298	880	502	214	609	189
1972	233	639	288	846	533	207	613	182
1973	244	636	271	795	530	196	618	172
1974	240	586	269	737	491	183	586	157
1975	278	599	284	703	451	170	579	143
1976	251	553	260	667	419	158	574	129
1977	259	540	252	694	388	141	541	118
1978	238	547	252	715	413	135	534	116
1979	215	511	241	731	409	128	527	115
1980	242	648	237	708	390	118	509	108
1981	222	556	250	724	393	114	516	106
1982	213	503	245	713	333	105	548	90
1983	241	502	247	705	338	100	537	84
Averages:								
1970-72	240	658	297	847	453	213	615	188
1981-83	225	520	247	714	355	106	534	93

Year	Cabbage	Pineapple	Canta-loupe	Water-melon	Banana	Plantain	Coconut	Sugarcane
1970	336	338	280	280	115	142	220	23.3
1971	334	400	296	295	98	148	236	23.9
1972	330	361	264	264	115	151	217	24.8
1973	310	358	250	249	106	143	201	25.0
1974	279	325	226	224	105	135	183	24.3
1975	257	297	205	205	151	128	174	24.1
1976	237	278	216	192	146	129	164	22.5
1977	212	249	200	172	130	120	145	20.0
1978	220	249	196	154	127	122	138	18.7
1979	230	241	202	164	128	119	128	19.2
1980	219	224	194	152	119	124	118	22.8
1981	219	234	205	159	114	126	110	22.0
1982	180	223	168	151	135	123	104	21.0
1983	197	236	175	152	143	122	100	n.a.
Averages:								
1970-72	333	366	280	280	109	147	224	24.0
1981-83	199	231	183	154	131	124	105	21.5[a]

(cont.)

Table 48. DEFLATED FARMGATE PRICES, cont.

Year	Cotton	Coffee	Palm Oil	Tobacco	Eggs[c]	Poultry	Fresh Milk[d]	Beef	Pork
1970	647	3029	111	3202	49.1	3053	0.40	1635	2560
1971	668	2863	114	4675	47.0	3091	0.41	1605	2593
1972	670	2623	104	4671	46.9	2878	0.39	1563	2524
1973	759	2915	106	4167	44.5	2934	0.39	1512	2437
1974	934	3171	101	3514	43.0	3161	0.37	1715	2437
1975	955	2359	111	3358	42.1	2964	0.37	1713	2287
1976	1121	3166	104	2937	41.0	2734	0.38	1700	2163
1977	1200	5882	93	2871	37.3	2487	0.36	1723	2047
1978	954	4470	103	2530	37.1	2398	0.37	1751	1958
1979	983	3255	92	2638	34.5	2343	0.37	1639	1881
1980	918	3197	110	2868	37.3	2224	0.35	1554	1850
1981	1002	2533	122	2722	35.7	2267	0.34	1554	1883
1982	689	1859	132	2710	35.0	n.a.	0.32	1449	n.a.
1983	667	1603	131	2779	n.a.	n.a.	n.a.	n.a.	n.a.
Averages:									
1970-72	662	2838	115	4183	47.7[a]	3007[b]	0.40[a]	1601[a]	2559[b]
1981-83	786	1998	128	2737	35.4[a]	2267[b]	0.33[a]	1502[a]	1883[b]

Notes: The farm gate prices are deflated by the GDP deflator, in the absence of an economy-wide producer price index or a sufficiently long series on the wholesale price index. [a]The base year for the deflator is 1978. [b]1981-82 average. [c]1981. [d]lempiras per box of 360 eggs. [e]lempiras per liter.

Sources: Tables 6.6 and 1.4.

[a]lempiras per box of 360 eggs. [b]lempiras per liter.

Source: Dirección General de Estadística y Censos, Secretaría de Economía y Comercio.

Table 49. INDEXES OF CONSUMER-PRODUCER PRICE RATIOS, 1970-83

Year	Corn	Beans	Rice	Potatoes	Onions	Bananas	Milk	Beef	Chicken
1970	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1971	0.76	0.81	1.16	0.74	1.13	1.15	1.00	1.10	1.00
1972	0.99	0.84	1.20	0.58	1.03	0.94	1.00	1.11	1.00
1973	0.98	1.24	1.09	0.68	0.84	0.95	1.03	1.24	0.99
1974	1.07	1.21	1.37	0.79	0.84	0.86	1.13	1.20	0.96
1975	1.27	1.11	1.61	0.74	0.99	0.55	1.08	1.08	0.96
1976	0.94	1.14	1.60	0.80	1.02	0.53	1.03	1.03	0.96
1977	1.29	1.30	1.49	0.78	1.15	0.52	0.92	1.01	0.96
1978	1.25	1.47	1.58	0.65	1.14	0.74	0.94	1.04	0.95
1979	1.29	1.46	1.50	0.80	1.24	0.68	0.92	1.24	0.94
1980	1.34	1.74	1.51	0.90	1.25	0.89	1.07	1.34	0.96
1981	1.18	1.73	1.50	0.90	1.23	0.88	1.21	1.49	0.96
1982	1.15	1.37	1.65	0.90	1.26	0.87	1.30	1.57	n.a.
1983	1.17	1.37	1.66	0.90	1.14	0.93	n.a.	n.a.	n.a.

Year	Eggs	Pork	Tomatoes	Cabbage
1970	1.00	1.00	1.00	1.00
1971	1.00	1.04	1.01	1.03
1972	0.99	1.03	1.18	1.08
1973	0.99	1.10	1.13	1.12
1974	1.05	1.22	1.12	1.03
1975	0.98	1.27	1.15	1.23
1976	0.98	1.28	1.32	1.46
1977	0.97	1.30	1.51	1.36
1978	0.93	1.34	1.40	1.19
1979	0.98	1.41	1.59	1.27
1980	1.00	1.42	1.92	1.51
1981	1.01	1.68	1.89	1.35
1982	0.98	n.a.	1.75	1.28
1983	n.a.	n.a.	1.78	1.23

Note: The indexes are defined so that, in each case, the ratio of the consumer price to the producer price is 1.00 in 1970.

Source: Tables 44 and 47.

Table 50.

SOURCES OF NET FARM HOUSEHOLD INCOME BY FARM SIZE GROUP, 1975
(lempiras/year)

	Farm Size in Hectares									
	0-2		2-3		3-5		5-10		10-20	
1. Crops	303	(33.8)	482	(40.2)	499	(37.2)	1044	(48.3)	1107	(46.4)
Corn	122	(13.6)	191	(15.9)	183	(13.6)	234	(10.8)	286	(12.0)
Beans	24	(2.7)	44	(3.7)	44	(3.3)	54	(2.5)	64	(2.7)
Sorghum	18	(2.0)	26	(2.2)	29	(2.2)	33	(1.5)	33	(1.4)
Rice	8	(0.9)	21	(1.8)	22	(1.6)	32	(1.5)	45	(1.9)
Coffee	30	(3.3)	85	(7.1)	125	(9.3)	230	(10.6)	366	(15.3)
Other crops	101	(11.3)	109	(9.1)	96	(7.2)	461	(21.3)	313	(13.1)
2. Livestock	97	(10.8)	165	(13.8)	209	(15.6)	465	(21.6)	722	(30.3)
3. Forestry and other agriculture	29	(3.2)	57	(4.8)	165	(12.3)	86	(4.0)	133	(5.6)
4. Total net agricultural income.	429	(47.9)	704	(58.8)	873	(65.0)	1596	(73.9)	1962	(82.3)
5. Off-farm income (net)	467	(52.3)	494	(41.2)	469	(35.0)	565	(26.1)	423	(17.7)
(on other farms)	199	(23.0)	173	(14.4)	139	(10.4)	97	(4.5)	122	(5.1)
6. Total net income	896	(100.0)	1198	(100.0)	1342	(100.0)	2161	(100.0)	2385	(100.0)
7. Total net agric. income per ha.	413		290		220		224		141	

Notes: Incomes are net of all costs except family labor. Figures in parentheses show the percentage composition of total net household income.

Sources: Calculated from information in (1) Inversiones y Estudios Económicos, Las Condiciones de Empleo e Ingreso en el Sector Rural Pobre de Honduras, Tegucigalpa, D.C., 1980; and (2) Dirección General de Estadísticas y Censos, Censo Nacional Agropecuario 1974, Tegucigalpa, D.C., 1978.

Table 51.

ESTIMATED DISTRIBUTIONAL EFFECTS ON NET FARM HOUSEHOLD INCOME OF A TEN PERCENT INCREASE IN PRODUCT PRICES (1975)
(lempiras/household/year)

Effects through	Farm Size in Hectares									
	0-2		2-5		5-10		10-20			
1. Crops	44	(10.2/4.9)	75	(10.7/6.5)	92	(10.5/6.9)	173	(10.8/8.0)	196	(10.0/8.2)
Corn	18	(4.2/2.0)	30	(4.3/2.5)	34	(3.9/2.5)	39	(2.4/1.8)	51	(2.6/2.1)
Beans	4	(0.9/0.4)	7	(1.0/0.6)	8	(0.9/0.6)	9	(0.6/0.4)	11	(0.6/0.5)
Sorghum	3	(0.7/0.3)	4	(0.6/0.3)	5	(0.6/0.4)	6	(0.4/0.3)	6	(0.3/0.3)
Rice	1	(0.2/0.1)	3	(0.4/0.3)	4	(0.5/0.3)	5	(0.3/0.2)	8	(0.4/0.3)
Coffee	4	(0.9/0.4)	14	(2.0/1.2)	23	(2.6/1.7)	38	(2.4/1.8)	65	(3.3/2.7)
Other Crops	14	(3.3/1.6)	17	(2.4/1.4)	18	(2.1/1.3)	76	(4.8/3.5)	55	(2.8/2.3)
2. Livestock	13	(3.0/1.4)	25	(3.5/1.9)	28	(3.2/2.1)	60	(3.8/2.8)	90	(4.6/3.8)
3. Forestry and other agriculture	3	(0.7/0.3)	6	(0.9/0.5)	12	(1.4/0.9)	10	(0.6/0.5)	15	(0.8/0.6)
4. Off-farm income (net)	0	(0/0)	0	(0/0)	0	(0/0)	0	(0/0)	0	(0/0)
5. Total effect	60	(14.6/6.7)	104	(14.8/8.7)	132	(15.1/9.8)	243	(15.2/11.2)	301	(15.2/12.6)

Notes: The initial set of figures for each farm size group shows the estimated increment in net farm incomes, by source, that would result from increases in agricultural prices of 10%.

Figures in parentheses refer to percentage shares of first, net household agricultural income, and then of total net household income.

Source: Calculated from Table 50 plus additional information from the study by Inversiones y Estudios Económicos that is cited in Table 50.

Table 52.

ESTIMATED DISTRUBUTIONAL EFFECTS ON NET FARM HOUSEHOLD INCOME OF A TEN PERCENT WAGE INCREASE
(Lempiras/household/year)

Effects through	Farm Size in Hectares 0-2	2-3	3 - 5	5 - 10	10 - 20
1. Crops	0	0	-6 (-0.7/-0.4)	-16[a/] (-1.0/-0.7)	-31 (-1.6/-1.3)
Corn	0	0	-2 (-0.2/-0.1)	- 3 (-0.2/-0.1)	- 8 (-0.4/-0.3)
Beans	0	0	-1 (-0.1/-0.1)	- 1 (-0.1/ *)	- 2 (-0.1/-0.1)
Sorghum	0	0	** (* / *)	** (* / *)	- 1 (-0.1/ *)
Rice	0	0	** (* / *)	** (* / *)	- 1 (-0.1/ *)
Coffee	0	0	-1 (-0.1/-0.1)	-3 (-0.2/-0.1)	-10 (-0.5/-0.4)
Other Crops	0	0	-1 (-0.1/-0.1)	-7 (-0.4/-0.3)	- 9 (-0.5/-0.4)
2. Livestock	0	0	-2 (-0.2/-0.1)	-7 (-0.4/-0.3)	- 6 (-0.3/-0.3)
3. Forestry and other agriculture	0	0	-1 (-0.1/-0.1)	-4 (-0.3/-0.2)	- 1 (-0.1/ *)
4. Off-farm income (net)	47 (11.0/5.2)	49 (7.0/4.1)	47 (5.4/ 3.5)	57 (3.6/ 2.6)	42 (2.1/1.8)
5. Total increment	47 (11.0/5.2)	49 (7.0/4.1)	38 (4.4/ 2.8)	30 (1.9/ 1.4)	4 (0.2/0.2)

Notes: * indicates absolute value less than 0.1%. ** indicates absolute value less than 1 lempira.

a/ in this and some other cases, the components do not sum to the total because of rounding errors.

The figures in this table do not take into account the probable capital-labor substitution that would occur in some cases with a wage increase and no increases in other prices; it probably would affect off-farm earnings especially.

Source: Table 50 and other information from the cited study by Inversiones y Estudios Económicos.

Table 53.

ESTIMATED DISTRIBUTIONAL EFFECTS ON NET FARM HOUSEHOLD INCOME OF A TEN PERCENT DEVALUATION WITH MODERATE WAGE RESTRAINT
(lempiras/household/year)

Effects through	Farm Size in Hectares				
	0 - 2	2 - 3	3 - 5	5 - 10	10 - 20
1. Crops	30 (7.0/3.3)	48 (6.8/4.0)	47 (5.4/3.5)	96 (6.0/4.4)	94 (4.8/3.9)
Corn	12 (2.5/1.3)	19 (2.7/1.6)	18 (2.1/1.3)	22 (1.4/1.0)	25 (1.3/1.0)
Beans	3 (0.6/0.3)	5 (0.7/0.4)	3 (0.3/0.2)	4 (0.3/0.2)	5 (0.3/0.2)
Sorghum	2 (0.4/0.2)	3 (0.4/0.3)	2 (0.2/0.1)	4 (0.3/0.2)	2 (0.1/0.1)
Rice	1 (0.2/0.1)	2 (0.3/0.2)	2 (0.2/0.1)	3 (0.2/0.1)	4 (0.2/0.2)
Coffee	3 (0.6/0.3)	9 (1.3/0.8)	13 (1.5/1.0)	21 (1.3/1.0)	32 (1.6/1.3)
Other crops	9 (1.9/1.0)	10 (1.4/0.8)	9 (1.0/0.7)	42 (2.6/1.9)	26 (1.3/1.1)
2. Livestock	9 (1.9/1.0)	17 (2.4/1.4)	20 (2.3/1.5)	43 (2.7/2.0)	69 (3.5/2.9)
3. Forestry and other agriculture	3 (0.6/0.3)	6 (0.9/0.5)	10 (1.1/0.7)	7 (0.4/0.3)	12 (0.6/0.5)
4. Off-Farm income (net)	24 (5.0/2.7)	25 (3.6/2.1)	24 (2.7/1.8)	29 (1.8/1.3)	21 (1.1/0.9)
5. Total effect	66 (13.7/7.4)	96 (13.6/8.0)	101 (11.6/7.5)	175 (11.0/8.1)	196 (10.0/8.2)

NOTES: 1) Figures in parentheses refer to percentage shares of, first, net household agricultural income, and then of total net income.
2) Moderate wage restraint is interpreted as a 5% wage increase while all product prices rise by 10%.
3) Input prices (except hired labor) as well as output prices are assumed to rise by 10%.

Source: Calculated from tables 50, 51 and 52, plus additional information from the cited study by Inversiones y Estudios Económicos.

Table 54.

ANALYSIS OF SHORT-TERM RURAL CONSUMPTION EFFECTS OF CORN PRICES
(Per farm household per year)

	Farm Size in Hectares				
	0-2	2-3	3-5	5-10	10-20
Corn production (tons)	0.847	1.405	1.590	1.839	2.393
Household income (L)	896	1198	1342	2161	2385
Value of corn cons'n (L)	221	261	280	388	417
Farm-gate price (L/Ton)	211	211	211	211	211
Rural purchase price (L/Ton)	275	275	275	275	275
Consumption price (L/Ton)	231	231	224	224	224
Qty of corn cons'n (Tons)	0.957	1.130	1.250	1.732	1.862
Home retentions (Tons)	0.662	0.782	0.989	1.370	1.473
Corn purchases (Tons)	0.295	0.348	0.261	0.362	0.389
Corn sales (Tons)	0.185	0.623	0.601	0.469	0.920
Sales Value (L)	39	131	127	99	194
Purchase cost (L)	81	96	72	100	107
Effects of 10% price increase:					
Δ Harvest value (L)	17.9	29.6	33.5	38.8	50.5
Δ Sales value (L)	3.9	13.1	12.7	9.9	19.4
Δ Purchase cost (L)	8.1	9.6	7.2	10.0	10.7
Net Δ welfare (L)	-4.2	+3.5	+5.5	-0.1	+8.7
Potential Δ welfare (L)	-3.0	+5.8	+7.2	+2.3	+11.2
% of total farms in stratum	37.1	14.7	12.1	14.5	9.8

Continuation of Table 54

NOTE: See text for explanation of method of constructing this table.

SOURCE: 1) Table 50; 2) Study of the Effects of Agricultural Development Policies on Food Consumption in Central America, Patterns of Expenditure and Food Consumption in Honduran Households, CONSUPLANE/SIECA-ECID/MRN, Tegucigalpa, D. C., October, 1982; 3) Dirección General de Estadística y Censos, Censo Nacional Agropecuario 1975, Tegucigalpa, D.C., 1978.

The percentages of farms in each stratum do not sum to 100% because the largest farms are not reported in the table.

*U.S. GOVERNMENT PRINTING OFFICE:1998-518-665:62986