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**FRAMEWORK FOR AN AGRIBUSINESS
STRATEGY IN NICARAGUA**

VOLUME I

for

USAID/Nicaragua

Prepared By CARANA Corporation

and

Sparks Companies

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4350 North Fairfax Drive, Suite 500, Arlington, VA 22203 USA

telephone: (703) 243 1700 fax: (703) 243 0471

CORAL GABLES, FLORIDA

SAN JOSE, COSTA RICA

LA PAZ, BOLIVIA

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SUMMARY

Nicaragua is a nation in transition, struggling to manage a tidal wave of economic and social change with virtually no guidance from historical precedent. The country has neither a history of democratic, representative government, nor a tradition of free enterprise. Perhaps more than any other economic sector, Nicaraguan agriculture and agribusiness was the focus of Sandinista policies, and as a result, face enormous future changes.

Under that regime, prices, credit, access to domestic and foreign markets, infrastructure investment and other resource allocations were controlled by the state. At the national level, these policies isolated the economy and created insurmountable problems including hyper-inflation, rapidly declining productivity and deep stagnation. For agriculture, they have meant collapsing markets and an enormous cost/price squeeze on producers.

This report is intended to facilitate the Nation's economic policy making as it undertakes the transition to open markets and competitively determined economic development. The report is designed to provide economic tools for use by the Government of Nicaragua (GON), USAID and other donors and private businessmen in formulating strategies for the restructuring and revitalization of agribusiness. It presents data and analyses of the current situation, helps evaluate GON and private industry options, and identifies selected crucial issues. It is not an economic blueprint, and contains no investment or resource allocation recommendations. Instead, it presents and evaluates current economic facts (some very harsh) and begins the process of evaluation of the nation's options as they relate to agriculture and agribusiness.

The report recognizes that expectations for agriculture within Nicaragua as the primary engine of growth are very high in Nicaragua. In spite of high costs, its potential as a source of jobs and foreign exchange (and the capital for re-investment in the economy) is greater than that for other sectors, especially in the short and medium term.

To meet the nation's expectations for economic growth in agriculture, thousands of individual producers will have to invest in improved and expanded operations. These decisions will be made on the basis of whether profit expectations are sufficient to stimulate investment in spite of the enormous risks, decisions that will be shaped by perceptions of reliable access to markets, credit and other inputs and services, as well as concerns with the stability of macro/sectoral policies and the security of land tenure. And, they will be affected by externalities including the poor condition of infrastructure and the lack of effective mechanisms for delivering services and know-how.

There is no major agronomic reason why Nicaragua cannot profitably expand production of a large variety of agricultural commodities and specialized niche products, especially since the technological solutions to many of the nation's productivity problems are known (and in use in other countries). However, some commodities, segments and producer groups require much greater investment than others to be competitive in regional and world markets. Given limited financial and management resources, economic and political trade-offs must be weighed and priorities established. To an important degree, the report's quantitative and qualitative analyses of current competitiveness are designed to help develop the necessary program and investment priorities.

The "policy analysis" context.

An evaluation of alternative GON policy options should include three kinds of economic recommendations:

- Solutions for current policy problems; the identification of and recommendations for modification of policies that are contradictory or otherwise damaging;
- Guidelines for the stimulation of private investment to achieve high priority GON goals;
- Guidelines for the allocation of government funds in support of private investment and productivity improvement.

This report focuses on the first of this three part structure involving immediate initiatives, and provides observations and a framework to facilitate discussion and debate concerning the latter two which together comprise an agribusiness development strategy.

The formulation of longer term development strategies is a process which must involve extensive discussions among interested parties to forge a shared vision and commitment. Furthermore, given a situation in flux, emerging strategies must be adjusted to reflect changing conditions, more reliable data and a better understanding of the world economy. More specifically:

- The nation's economic and social policies continue to be uncertain: The current stabilization plan was announced last March and virtually none of the relevant economic policies has been in place for a full season. Current estimates of producer, investor and GON responses to these policies can be inferred from those in other countries (and in Nicaragua, under different economic and social

conditions) and a number of such inferences have been presented in the report, but their basis continue to be highly tentative because of the lack of relevant historical experience in Nicaragua.

- Many conventional techniques of economic analysis are not appropriate in Nicaragua at this time because the situation is so dynamic and unsettled. A'n economic analysis must be done with extreme care so as not to make future projections on the basis of past trends and relationships that no longer exist. Crucial aspects of Nicaragua's economic and social policies remain to be decided. These special uncertainties make evaluation of current GON options extremely difficult since they include such fundamental economic matters as ownership (and protection) of land and other resources, among others.
- The world has changed dramatically during the 1980's. Competitors for world agricultural markets today are enormously more sophisticated and better capitalized than they were in the 1970's. Competition for markets where Nicaragua had important advantages has become more intense; some continue, but many do not. The redevelopment of linkages to current world realities is occurring slowly and appears to be affecting the sector's capacity to respond both to markets and GON policy changes.

Current Economic Situation

Nicaragua's economy contracted by 20% during the 1980's while income per person declined 43%. This performance has been accompanied by hyper-inflation, low export levels, balance of payments deficits, and a broad pattern of decline in the general standard of living. While infant mortality was reduced and literacy increased, purchasing power of most workers has fallen and consumers have reduced consumption of "modern" diet items while only maintaining consumption of corn and beans. Consumption of the 11 primary grain and meat items declined from 2,129 calories daily in 1980 to 1,536 calories daily in 1990.

The most obvious indicator of the state of Nicaraguan agriculture is the precipitous decline in productivity during the 1980's. Nicaraguan yields have fallen (and unit costs increased) while most competitors have increased yields dramatically (and world commodity prices have declined as a result). To catch up with its principal competitors, Nicaraguan growth must exceed theirs; current yield declines must be reversed and rapid new growth trends established.

Sugar, meat, coffee and banana exports have grown in recent years, but cotton and basic grain production have been stagnant or declining. In both cases, the primary factors behind the trends have been shifts in world market conditions abroad and the enormous changes in exchange rates and input costs in Nicaragua. Many of these adjustments have been especially difficult for basic grains producers. In spite of GON efforts to support domestic prices, rapid increases in costs, extreme uncertainty and relatively low economic returns have reduced economic incentives to invest in basic grain production. As a result, harvested area declined 25% during 1988-90.

At the present time, four principal factors are restraining the sector's potential growth:

- Poor incentives to adopt improved technology. Yields on "technified farms are not sufficiently high to pay for the capital invested in technification, in many cases. Poor management, rapid changes in input costs, uncertainty regarding market price expectations, decapitalization, inappropriate or obsolete technology are responsible. In other cases, buyers do not pay premiums for improved quality of output. Thus, appropriate technology will not necessarily be adopted by many producers, even if it is available.
- Lack of effective public or private technology transfer mechanisms and service institutions. Input suppliers and marketing agents presently lack incentives to work closely to support producers. There is little competition for clientele on the basis of prices, reliability, quality or services. Thus, costs are high and prices to producers low, without any premiums for quality or reliability. In addition, existing associations focus on gaining policy concessions rather than providing services to their constituencies. The problem is especially acute for small and medium scale farmers who tend to be treated paternalistically by overly centralized institutions. Furthermore, associations tend to focus on the protection of commodities currently produced, rather than helping growers evaluate options.
- Policies that distort market signals. These include: central allocation of credit; the controls on basic grain imports and exports (which have seriously depressed bean prices, for example); exports through parastatal associations; support for input suppliers and marketing agents without strong incentives to work closely with producers; preferential tax and foreign

exchange regulations for "non-traditional" export commodities; and others. Current policies are distorting investment patterns limiting sector flexibility and diminishing incentives to adjust to regional and world market changes.

- Limited research and development. Efforts to develop and test improved and commercially attractive varieties and technologies, and to determine and develop new product opportunities (especially in nearby countries) are generally low and, in some cases dedicated to economically marginal products. Expansion and refocussing of his critical area of support is essential for a growing, viable industry.

Sector Growth Potential

Since economic growth and development depend on investment, the relative competitive positions of different commodity groups were examined in some detail (although data on costs and returns are limited and incomplete, and the use of time series virtually precluded by the recent chaotic economic situation and rapid cost increases). Current economic "snap shots" provide several fundamental economic insights.

Each of the export crops and the basic grains has positive returns for production with hand labor, but as levels of input use increase, returns decline and, for most, turn negative at high levels of technification. Mechanized corn production, for example, is unprofitable at current prices. Bean production is profitable for non-mechanized producers, while sorghum production is profitable for both traditional and mechanized producers. To some extent, such trends would be expected in response to the rapid increases in input costs¹. However, the most troubling aspect of the Nicaraguan production trends is the low productivity of producers who do use relatively high levels of technology.

Perhaps the most sensitive measure of competitiveness is the domestic resource coefficient (DRC), the relationship between the net cost of producing commodities domestically using national resources and the net cost in foreign exchange of importing that product. Not only does this comparison indicate whether it is cheaper to produce than to import, but it also permits comparison of efficiency levels among products.

Three important dimensions of competitiveness are shown by the analysis for the major basic grain and export commodities. The first is the absolute and relative DRC levels; the second is the size of the individual subsectors; and the third is their

¹ To some extent, the problem of high costs is overstated by producers who use these figures to plead for better credit and price support from the Government.

current rate of growth. Considered in this way, the DRCs provide a view of subsector potential in spite of current economic uncertainties.

The analysis of competitiveness in Nicaragua indicates that each of the traditional export crops is an efficient earner of foreign exchange (in terms of its DRC), but that coffee, beef and bananas, especially, have large current industries with favorable degrees of export market competitiveness and at least some potential for future growth.

Several important implications can be drawn from such comparisons.

- Coffee, bananas and beef exports likely will continue to be extremely important for the foreseeable future because of the current level of expertise and capital invested in these industries, the large external markets and their potential for growth and their relatively competitive position as an earner of foreign exchange.
- Beans and sorghum subsectors are relatively competitive in domestic markets (and bean production has some potential to earn additional foreign exchange). The bean subsector is somewhat larger and somewhat more competitive, but sorghum has substantial potential to expand because returns to the mechanized part of that subsector are positive, and because it has a large potential domestic feed market as well as potential regional export markets.
- For corn and cotton, DRCs are marginally below the official exchange rate but the DRC for rice is higher than the official rate. This indicates that rice production on average costs more domestic resources than is saved in foreign exchange, and that it would be cheaper to import the necessary supplies of rice than to produce them domestically. However, this applies to the "average" producer, which includes producers well above and below average efficiency levels.

For both corn and rice, DRCs are low for production with hand labor but greater than the exchange rate for mechanized production. This implies that production of these crops using traditional methods is efficient and saves foreign exchange, but that efforts to expand production, especially using mechanized production methods, will require more foreign exchange than is saved unless

especially using mechanized production methods, will require more foreign exchange than is saved unless productivity can be increased significantly.

Basic Grains Policies

The stagnant basic grains sector implies very serious problems for the primary Nicaraguan food supply during the 1990's. For example, an extension of current policies through the decade could mean per capita consumption of corn declining from about 127 pounds per year in 1991 to well below 100 pounds by 2000, depending on assumptions regarding donations. For the four basic grains, per person availability could decline by as much as one-third during the decade in the absence of policies that support increasing economic activity in agriculture.

However, more cohesive and stable policies would be expected to stimulate production and reduce pressure on the food supply. Such policies would:

- Provide producers access to credit on the basis of expected productivity, rather than on the basis of central allocations as is done now;
- End export restrictions so that producers could sell in nearby regional markets when it is profitable to do so;
- End import restrictions and GON interventions in import markets so that producers could purchase production inputs at world prices plus nominal duties;
- Provide research, development and technical assistance to help producers improve productivity and compete in regional markets;
- End GON intervention in local markets through marketing and other parastatals; help develop local infrastructure so as to narrow producers' marketing margins and help the agricultural subsectors become more responsive to changes in national and international supplies and demand.

Also, less intrusive GON policies could provide incentives to increase both basic grain production area and yields, and change the sector from one that is declining at the end of the decade to one with prospects for moderate growth and reorganization.

While basic grains production could grow significantly under the alternative policies (almost 6% annually in contrast to 2.4% under current policies), much of the increase in food availability likely would come from commercial imports, which are projected to increase from zero in 1990 to 171,000 tons by 2000.

Overall Implications

The foregoing review of the current agricultural situation in Nicaragua holds a number of implications for GON policy.

Commercial imports of basic grains likely will be required in the future to feed the urban population. Even with more coherent and supportive policies, future availability will fall relative to current levels. A key question for GON is whether to invoke extraordinary measures to produce the needed grain domestically, or to depend on commercial imports.

On the basis of current conditions, the following summary observations are offered:

- Investment in agricultural production is an enormous problem in Nicaragua, the result of a large number of factors. These include weak markets, high costs and low productivity growth, lack of capital, the central allocation procedure for credit and lack of access to foreign markets for inputs and products. Because investment is such an important problem, the tendency is for the GON to ration capital in an effort to allocate it equitably. Instead, the approach should be to allocate it on the basis of potential return to each investment so that efficiency and earnings are maximized.
- Marketing costs. Because of past GON interventions in agricultural production and distribution, the important role of parastatals and the general decapitalization of the sector, the agricultural marketing infrastructure is highly disorganized and very inefficient. Marketing costs are high, and the sector transmits price and investment signals from market to producer very indirectly. The result is diminished returns to producers, increased instability throughout the sector and sharply restricted investment in both production and marketing.

Because Nicaraguan markets are small, the competition from large numbers of well informed bidders for agricultural products necessary to ensure low cost marketing may not be possible relying only on domestic channels. However,

opening domestic markets to international competitors can make those markets much more dynamic. Furthermore, marketing agents who seek reliable, high quality suppliers, can be extremely valuable in transferring technology to producers. At the same time, moderate, uniformly applied tariffs can provide much of the protection from wide swings in world prices now provided by non-tariff barriers and trade restrictions. The result likely would be a much more vigorous agricultural sector, increasingly responsive to both domestic and international shifts in supply and demand.

- Cotton production appears to be afflicted by more serious problems than the other commodities. Falling productivity has reduced investment in the sector, a trend that has accelerated the basic productivity decline (in particular, producers are having enormous difficulty dealing with damaging pests without both incurring high production costs and corollary environmental damage).

Also, production in many of the world's large cotton exporters has grown rapidly in recent years, faster than world markets. The result is current pressure on prices and potential continued strong competition in the future. Thus, the combination of increasing competition and declining world market prices seriously weakens the investment outlook for this commodity.

At the same time, this outlook raises serious questions regarding both potential uses for land now in cotton, and alternative supplies of high protein meal and oil now produced from cottonseed. To date, the National Cotton Commission has invested considerable effort in developing techniques to deal with pests that are reducing cotton productivity. While these efforts are badly needed, questions of alternative uses for cotton land are also of high priority.

- Poultry. The GON appears to have implicitly decided to expand domestic poultry production to provide high quality protein products for domestic production and as a conscious strategy to make beef consumption less attractive so as to free beef for export.

Poultry production on the scale feasible in Nicaragua

requires imports of several important inputs, including veterinary biologics, high quality, genetically improved day-old chicks (or fertilized eggs) and specialty feed stuffs (especially, high protein meals). Thus, even though the local industry appears to be relatively efficient, it will be difficult for it to compete with imported finished poultry products if the local industry's costs are inflated by policies that restrict access to high quality, low cost imports.

- Beans and sorghum. These commodities are current bright spots in the basic grains outlook, but much of the outlook depends on which production technologies can be improved the most. Bean production includes a number of types and varieties, and market preferences are strong. Genetic potential also appears to be strongly related to individual varieties, both in terms of production potential and disease resistance. The GON must use these and other factors to allocate scarce funds for research, testing, technology transfer and technical assistance among competing crops and uses.

Strategic Planning

Each of the commodities that has an apparent comparative advantage in earning major amounts of foreign exchange (or avoiding foreign exchange) and creating jobs has very large needs for investment in productivity growth. This includes, especially, coffee production, forage improvement for cattle production, and bean and sorghum production. Because the lead time required to improve productivity is so long, GON allocations will be required on the basis of current judgments regarding production and market potential. While GON policy should be to make most resources available and require annual competition among production alternatives on the basis of expected short run returns, investment in both market infrastructure and industry research, development and technical assistance will need to be made on the basis of central GON and private sector evaluations of market and production potential, and intermediate and long-term national development strategies. Furthermore, given limited GON resources, emphasis must be given to ways of stimulating private mechanisms for developing and transferring technology.

Given limited financial and management resources, economic and political trade-offs must be weighed and priorities established. In this context, some of the key questions which must be addressed as Nicaragua looks to the future include:

- The study indicates that low productivity is Nicaraguan agriculture's greatest problem. How can productivity be raised, and how should this problem be approached?
- What policy changes would create greater incentives for investment and technological innovation across the board, as well as encourage the channeling of resources into the areas in which Nicaragua has the greatest comparative advantage?
- To what extent should free and open markets be relied upon to determine "winners and losers", both among commodity groups and individual producers and agribusinesses? How quickly should the transition be made from a system in which the GON is directly or indirectly making most of the choices?

To what extent is it essential to focus limited resources (at least in the short term) on commodities, segments and producers that are in relatively better condition to respond to market opportunities and thus best able to catch up to their competitors? And, what is the opportunity cost to the economy (both in terms of time and investment) to invest scarce capital resources in subsectors that have the greatest problems and highest risk (at least some of which may not be capable of solution)?

- What GON resources and measures are required to support particular commodity and producer groups during the process of restructuring to achieve international competitiveness?
- To what extent should some commodities and food products be subsidized for strategic or political reasons? Which commodities? For how long?
- What are realistic expectations for resources available for the agricultural transition?
- Where and how can the private sector (small and large

scale) help itself in accessing technology, markets and credit? What is required to stimulate these private mechanisms and institutions?

These are questions that only Nicaraguans can answer for themselves, although the report provides information and an economic framework, by major commodity group and cross-cutting problem area, to support the strategic planning process required. The answers to these questions must emerge as a consensus of private and public sectors, given that each must collaborate fully if strategies for addressing the formidable issues facing Nicaraguan agribusiness are to succeed.

Framework for an Agribusiness Strategy in Nicaragua

Volume I

Submitted to:
USAID/Nicaragua

By:
CARANA Corporation
Sparks Companies

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I. Introduction

The objective of this report is to provide a baseline assessment of the present state of Nicaraguan agriculture and to identify the principal opportunities and constraints for revitalization.

The report has been structured to facilitate discussions involving the Government of Nicaragua, the private sector, USAID, other donors and interested parties in answering the following questions:

- **What contribution could agribusiness make towards meeting the principal macro-economic challenges facing Nicaragua: jobs, foreign exchange, improved standards of living?**
- **Which products/markets represent the most promising opportunities in meeting these challenges?**
- **What are the principal issues impacting investment in these priority areas?**
- **What are the implications and alternatives for a comprehensive agribusiness strategy?**

Ultimately, the final strategy will have to emerge as the shared vision and commitment of the Nicaraguan Government and private sector.

The focus of this report is on agribusiness, not just agriculture. Strategies should be market driven and embrace entire systems comprising producers, input suppliers, processors/packers, and distributors.

I. Introduction

The **methodology** utilized in preparing this report has two principal vectors:

1. Analysis of cross-cutting issues affecting all agribusiness systems, including:
 - Macro policy framework
 - Land tenure situation
 - Dysfunctions affecting every commodity system: distribution of inputs, distribution and marketing, financial intermediation/agricultural credit

2. Analysis of the structure, opportunities and constraints in significant agribusiness systems:

Primarily export markets

Coffee
Cotton
Bananas
Melons/non-traditional exports

Domestic markets

Corn
Beans
Rice
Sorghum
Broilers

- Cattle has already been studied by USAID consultants, leaving sugar as the only major system not analyzed. However, this is a special case where lessons from recent studies elsewhere in Central America may be relevant.

- The agribusiness system analyses are structured to illustrate: markets; key players; structure of production; prospects, constraints and issues; and key strategic implications. In addition, resource costs have been calculated to provide an indication (albeit rough given poor data and rapid economic changes) of competitiveness.

Nicaraguan agribusiness is highly dynamic, affected both by rapidly changing economic policies and external market factors. Data was collected through July, 1991 before the impact of evolving events on the 1991-92 harvest and production costs could be fully determined. However, the report has been structured to provide the analytical framework and tools for updating as appropriate.

I. Introduction

The report has been structured in two volumes. Volume I presents the key issues in a format designed to facilitate discussion and further elaboration of a strategy. Volume II presents more detailed analyses and projections for those seeking further understanding of the current situation and the assumptions used for alternative future scenarios.

Volume I is organized into the following sections:

- II. **Agribusiness in the Context of The Macro-Economic Situation** poses, in terms of key indicators, the issues that Nicaraguan decision makers must consider in setting priority objectives and measurable targets. It also seeks to assess the role agribusiness can play in meeting these objectives and targets.
- III. **Nicaraguan Agribusiness: Principal Constraints** reviews the cross-cutting dysfunctions limiting investment and productivity in all or most agribusiness systems.
- IV. **Commodity Systems** profiles the principal agribusiness systems with a principal focus on markets, economics, outlook and issues.
- V. **Developing a Strategy for the Agribusiness Sector** presents the principal conclusions of this project as elements of the national debate that must take place to formulate an appropriate strategy and action plan.

Volume II includes:

- I. **Introduction**
- II. **An overview of the agribusiness sector in Nicaragua** with particular emphasis on basic grains, including an assessment of current levels of protection and competitiveness and a review of policy implications.
- III. **The Structure of Agribusiness and Systems in Nicaragua** in more detail than presented in Volume I, Section IV.
- IV. **The Present State of Farmer-Land Relations in Nicaragua**
- V. **Statistical Annexes** including projections of agricultural production and consumption under alternative policy scenarios, effective protection rates and domestic resource costs.

II. Agribusiness in the Context of the Macro-Economic Situation

A. Selected Macro Indicators

Nicaragua's economy contracted by 20 percent in real terms in the 1980s, while income per capita declined a dramatic 43 percent. This contraction has been accompanied by hyperinflation, low levels of exports, trade and balance of payments deficits, and high fiscal deficits.

Selected Economic Indicators (1980 \$MM except where noted)

	<u>1980</u>	<u>1985</u>	<u>1988</u>	<u>1989</u>	<u>1990</u>
GDP	2,080	2,147	1,794	1,743	1,666
GDP per capita	751	656	495	466	430
Inflation (%)	24	334	33,657	1,689	13,490
UN- & Underemployed (1,000s)	159	219	310	397	502
Unemployment (%)	18	21	27	33	40
Exports, FOB	445	305	236	290	321
Imports, FOB	816	794	718	547	591
Trade Balance	-371	-489	-482	-257	-270
Current Account	-430	-726	-584	-531	-570
Balance of Payments			-491	-651	-875
Long term foreign debt	1,571	4,618	6,773	7,544	8,064
Fiscal deficit/GDP (%)	8.4	23.3	27.0	2.6	N.A.

Source: Ministerio de Cooperacion Externa, Nota Tecnica No. 2

Controlling inflation is a critical first step, but the indicators also highlight the urgency of stimulating economic growth, especially export oriented, in order to generate the large number of jobs required, pay for the imports required by the productive sectors, improve per capita income levels and standard of living, and meet the country's foreign obligations.

II. Agribusiness in the Context of the Macro-Economic Situation

A. Selected Macro Indicators

The 1980s saw progress in some social areas such as infant mortality and illiteracy. However, other indicators reveal the extent to which the economic contraction has impacted on the Nicaraguan population. As the purchasing power of real salaries declined dramatically, so consumers reduced consumption of "modern" diet items, but maintained the levels of corn and beans.

	Consumption per capita Kilo calories per day		
	<u>1980</u>	<u>1985</u>	<u>1990</u>
Rice	430	351	275
Corn	631	774 ¹	531
Beans	141	154	153
Sugar	360	522	283
11 grains/meat	2129	2317	1536
Exc. donations	2121	2194	1234

¹ 1985 statistics for corn are above the level trend of the 1980s that shows only a modest drop off in urban consumption of this staple.

II. Agribusiness in the Context of the Macro-Economic Situation

B. Job, Export and Investment Requirements

Nicaragua is presently tackling immediate priorities such as the "Concertacion" process and stabilization of the economy. It also feels pressure to formulate a strategy for rapid generation of the economic growth required to address the pressing economic and social needs of the population.

It is estimated that 60,000 jobs will have to be created annually over the next 10 years to adequately employ 85 percent of the labor force (including new entrants and those currently UN- and underemployed, but excluding the return of emigres).

- **This assumes 500,000, or 40 percent unemployed (or seriously underemployed), in 1990 and a labor force growth of 3.5 percent. The number could be higher as the public sector and state enterprises are streamiined.**
- **By way of contrast, actual full time employment decreased by 72,000 between 1985-1990, while the number of underemployed increased by 283,000.**

Between \$750 million and \$1 billion in exports will have to be generated in ten years in order to balance the current account and meet the country's foreign obiiigations.

- **This assumes a current account deficit of \$500 million, and the fact that more imports will be required to generate exports.**

Food consumption is 42 percent below the 2,185 calories daily to meet minimum daily requirements as established by FAO.

The projections above are intended only to make the point that the magnitude of the challenge is enormcus, even when measured in terms of these simple criteria.

II. Agribusiness in the Context of the Macro-Economic Situation
B. Job, Export and Investment Requirements

Given the magnitude of the task, some basic strategic guidelines are:

- **The need to carefully channel the country's limited resources into priority products/markets, as identified through the planning process.**
- **Given the limited resources available to Government (in view of the fiscal deficit and increasingly limited foreign donor assistance), the primary burden for generating productive jobs will have to fall on private sector investment.**
- **The need to overcome a major foreign exchange constraint, combined with the limited size and purchasing power of the domestic market, means that producing for export markets must be the principal engine of development.**

Mobilizing high levels of private investment will be a critical priority to the success of revitalization/growth strategies.

- However, recent performance has been extremely weak in this area-- Although total investment has averaged 23 percent of GDP between 1985-1989 (compared to 28-35 percent in the rapidly growing economies of Asia), private investment has averaged only 11 percent.
- Total domestic savings were negative between 1985-1989 (with a 2.8 percent savings rate in 1989), indicating reluctance of private citizens to invest and reliance on foreign donors.

Private investment requirements, to generate 60,000 jobs per year, can be estimated at a minimum of \$300 million annually.

- This assumes a conservative \$5,000 per job (outside agriculture).
- Investment in export oriented goods and services would need to be about \$100 million per year, assuming \$1 investment for \$1 of exports, and a requirement of \$1 billion in exports over 10 years.

ii. Agribusiness in the Context of the Macro-Economic Situation
 C. Comparative Growth Potential of Key Sectors

Investment on the scale required will have to be in sectors with markets offering significant potential, especially those which Nicaraguan businesses know well, and where the country has both the resources and has acquired some comparative advantage. Agribusiness should have the highest priority in an overall strategy for economic revitalization, at least in the short term. Unlike manufacturing, mining, tourism and other activities, where extensive new investment in infrastructure and productive capacity must precede any results, agribusiness offers by far the best potential for a quick response to appropriate policies and support measures that stimulate improved yields.

<u>Sector</u>	<u>Resources/Advantages</u>	<u>Constraints</u>	<u>Overall Potential</u>
Agribusiness	Good quality land base Moderate land/population ratio Access to international markets Potential local/regional markets	Declining yields Obsolete technology Poor infrastructure/support Land tenure conflicts Unfavorable exchange rate Nationalized distribution/mktg. Central allocation of credit	Fillip from recovering historic yields Moderate potential from new areas Short & medium term prospects dependent on regional growth and selected world market growth.
Manufacturing/ Maquila	Potentially low cost labor Large, but very competitive int'l markets (maquila)	Low productivity Overprotected, inefficient capacity Small domestic market Growing know-how gap No free zones/support structure Poor labor/mgt relations (conflicts) Competition from Central America	Good medium term prospects for maquila Other prospects limited Free trade agreements will require complete restructuring
Tourism	Sun/sea/sand	Sun, sea, sand mkt. saturated Limited attractions Lack of support services	Modest medium term prospects (sun sea, sand) Other prospects limited
Natural Resources	Untapped natural resources (forestry, fishing, mining) Adequate int'l markets	Lack of investment/policy framework Limited infrastructure Limited info. on resource base	Low short term prospects Good medium term potential

II. Agribusiness in the Context of the Macro-Economic Situation
 C. Comparative Growth Potential of Key Sectors

While maquila and the exploitation of natural resources are promising as sources of jobs and foreign exchange, these will take longer to develop. Agribusiness will, if the others don't provide jobs/foreign exchange, then have to play the leading role, especially over the next five years. Some rough projections of the possible contributions of different sectors, to the requirements/targets outlined above, are as follows:

	<u>1991-1996</u>	<u>1996-2001</u>
New Jobs- Overall Target	275,000	325,000
Productive Jobs	90,000	100,000
Agribusiness	50,000	30,000
Manuf./maquila	20,000	40,000
Other productive	20,000	30,000
Additional exports(\$ Million)	500	500
Agribusiness	350	300
Manuf./Maquila	50	100
Other productive	100	100

The productive jobs and exports indicated above would generate demand for support services, help finance imports for additional productive activities and consumption, increase the tax base and generally enhance the standard of living. Given the highest economic returns, top priority must be assigned to agribusiness.

III. Nicaraguan Agribusiness: Principal Constraints

A. Introduction

Agriculture is the most important sector of the Nicaraguan economy with 24% of GNP in 1990, and accounting for 73% of export earnings.

- 61% of the sector's value added is from crops (35% from export crops and 20% from basic grains). Cattle accounts for 28%, followed by coffee with 18%. Corn is the most important basic grain.
- Coffee has been the major export crop in recent years with about 29% of export earnings in 1990, down from 47% in 1988. Meats, cotton, sugar and bananas provided most of the balance.

Performance in the 1980s has been mixed. Until 1988, output of basic grains increased intermittently while export crops declined significantly (reflecting government policies). Since 1988, and in response to more liberal policies, several export products, notably meats, sugar and bananas have increased substantially, while the output of basic grains has stagnated (and declined for sorghum and rice.) (see following figures)

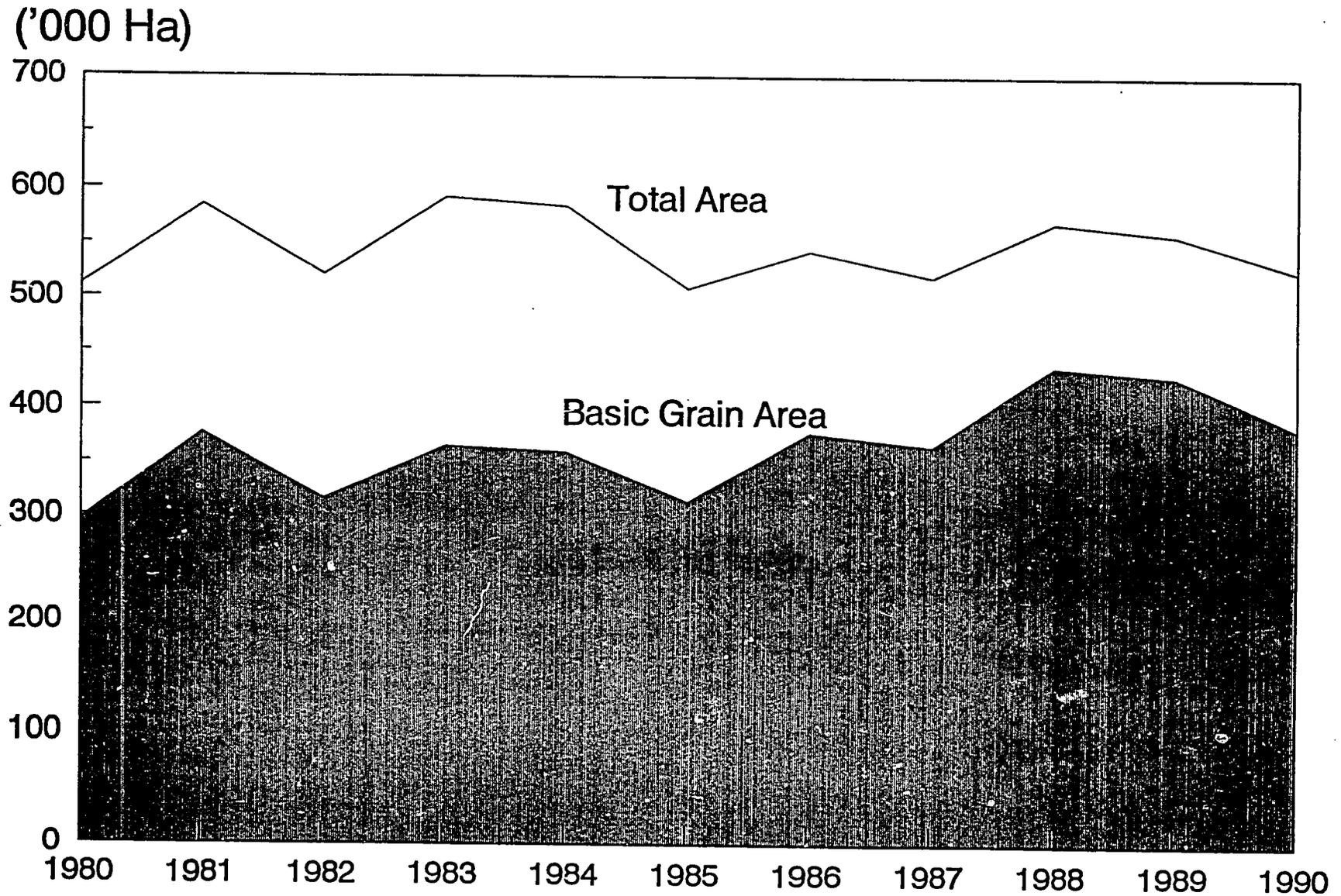
One of the most notable characteristics of Nicaraguan agriculture is relatively low yields. The following index contrasts crop yields in neighboring countries for 1988, with Nicaragua representing 100:

<u>Country</u>	<u>Corn</u>	<u>Beans</u>	<u>Rice</u>	<u>Coffee</u>
Guatemala	113	104	76	114
El Salvador	136	122	112	163
Honduras	101	92	86	103
Mexico	122	97	103	141

Source: FAO

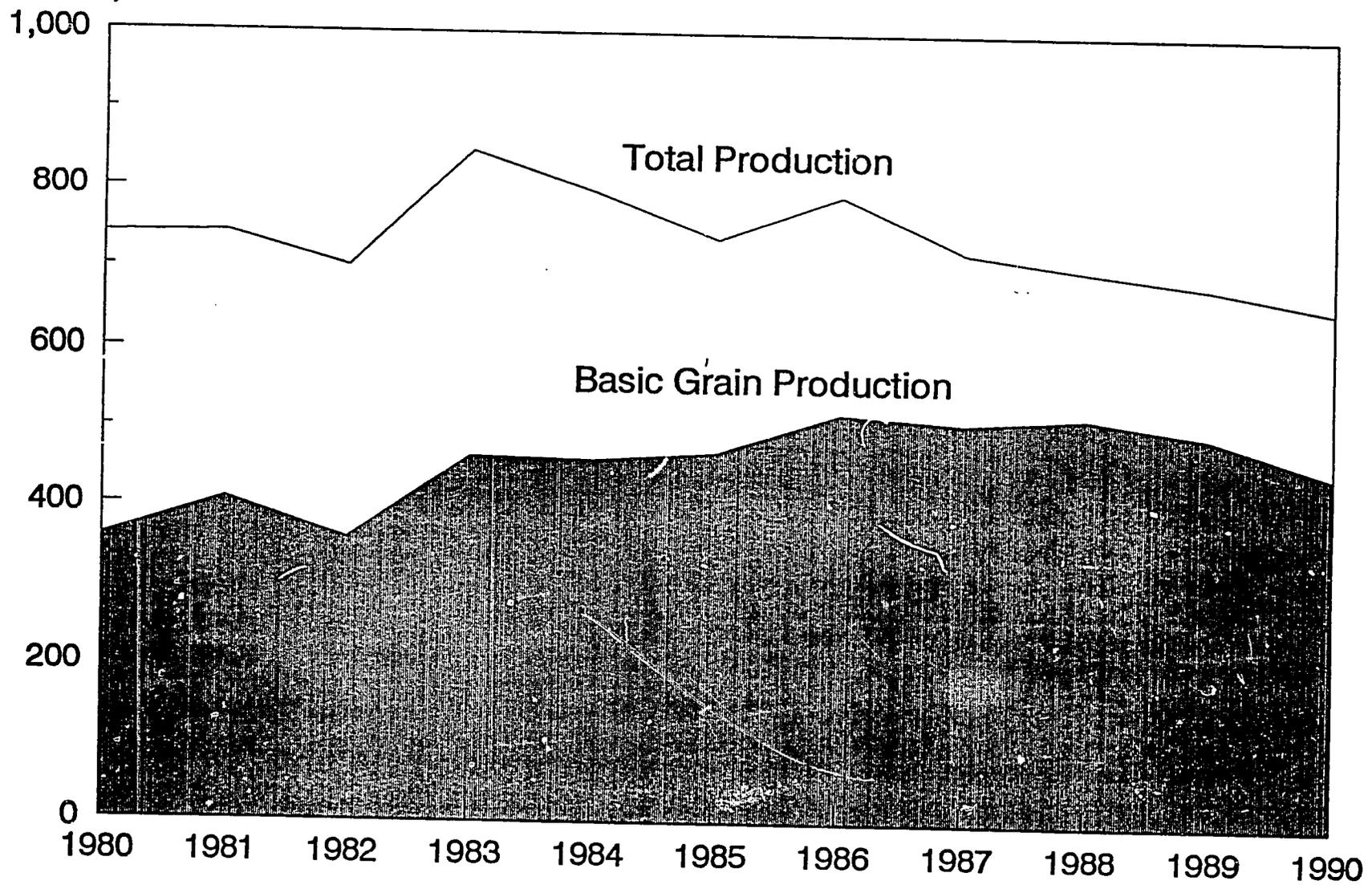
The following sections seek to determine the factors influencing performance of agriculture, and especially the declining competitiveness. The first part reviews principal constraints affecting the entire sector (policies, land tenure, input distribution, marketing, institutions, and human and physical infrastructure). The second part (Chapter IV) focuses on specific agribusiness systems.

Total Area -vs- Basic Grain Area



Total Production -vs- Basic Grain Production

(TMT)



III. Nicaraguan Agribusiness: Principal Constraints
B. Macro-economic Policies

The tendency to intervene extensively in the allocation of resources has been the dominant feature of the government policy.

- This tendency reached its peak when the Sandinista government nationalized and administered centrally marketing, input distribution, credit allocation and land tenure policies.

Credit, land tenure, marketing/pricing and input distribution policies will be analyzed in more detail in subsequent sections. However, some general policy implications include:

- A bias in favor of certain regions, especially the Pacific plain over the "north" and the "Atlantic" lowlands;
- Favoritism for collectives and state farms in the allocation of resources (especially during the Sandinista period).
- Arbitrary and sporadic promotion of certain commodities (cotton, rice, corn) through the central (political) allocation of credit and pricing, foreign exchange and trade policies.
- High costs, poor quality, and inefficient utilization of inputs, exacerbating the decreased profitability of most crops as the level of technology increases.

The overall consequence of policies has been the severe distortion of market signals and the misallocation of resources between products, types of technology and regions, accompanied by the inadequate incentives to improve productivity.

While the present Government is committed to trade economic liberalization, the principal problem is perceived to be the transition process in which many of the beneficiaries of prior interventionist policies are likely to be hurt.

- The Government's declared intention of liberalizing the economy, particularly trade in commodities, exposes the beneficiaries of previous interventions to economic setbacks during the transition period.

III. Nicaraguan Agribusiness: Principal Constraints

B. Macro-economic Policies

Nominal and effective protection of agriculture in Nicaragua is low and in some cases negative. The level of international competitiveness is relatively good for coffee and bananas, but not cotton. The competitiveness against world market imports of beans is high, dryland rice is moderate, sorghum is medium, and corn is low.

There are two broad measures of the attractiveness of a commodity: profitability and value added.

- Profitability, reflects simply the return to land and labor of a crop compared to alternatives. In general, farmers will grow the crops that generate the highest returns.
- Value added, views attractiveness from the value added by national factors: labor, land, local machinery, and other inputs. In an unconstrained market and with a freely traded currency, value added should coincide with profitability. In a situation like that of Nicaragua, distortion is likely. Hence one task of government is to calculate the relative attractiveness of crops, compare the ranking to that reflecting current profitability, and address any perceived misallocation of resources. For example, the export ban on beans results in a low ex-farm price that makes beans only as profitable as corn--yet beans are immensely more attractive from a value added standpoint.

While the above data reflects current costs and yields, the key question (especially for the commodities presently considered uncompetitive), is whether the allocation of scarce resources to improvements is likely to result in payoffs comparable to other, more promising systems. The potential for improvement is presented in the review of specific agribusiness systems.

III. Nicaraguan Agribusiness: Principal Constraints

C. The Land Tenure Situation

The high level of insecurity regarding land tenure impedes needed reinvestment in promising agribusiness systems. Although most of the attention has been focused on the Sandinista reforms, in particular on the titling in the transition period after the election, three types of conflicts can be identified:

1. **Titling conflicts**, which are the primary focus of attention, and which include:
 - Those whose land was confiscated under the Sandinistas, including the so-called Pinata.
 - Small scale farmers and coops (or members) seeking to secure and revalidate title to land obtained under the Sandinista reforms.
 - The transfer of CORNAP properties to former owners, demobilized military and resistance and workers.
 - Overlapping claims, contested titles and delays in titling created by administrative and cadastral problems.

2. **Conflicts between owners/managers and workers over control of properties.**
 - The focus on the supposed "rights of ownership" displaces what could be the more productive discussion of how to create more value, and the negotiation of how additional income could be shared.
 - This problem is exacerbated, not only by the politicization of the workers on state farms, but by the tendency of management (Sandinista and private) to focus on capital intensity rather than improvement of labor productivity. The result is extraordinarily low wages, especially in relation to the investment in equipment and the value of land.

3. **Squatting and land invasions**, some politically organized, some due to the distribution of non-existent land, but also resulting from population pressures, extreme poverty levels and the lack of alternative employment opportunities.
 - Attractiveness of subsistence or sub-subsistence plots as a means of survival (confirmed by both the employment statistics and field visits), especially common in Region IV.
 - **Promises of land, and the incorrect myth of a land frontier heightens expectations and frustrations.** Data suggest that virtually all prime land is already claimed, with only very marginal and some abandoned land available for settlement. Thus, resolution of this conflict will be difficult and require a long time.

III. Nicaraguan Agribusiness: Principal Constraints
C. The Land Tenure Situation

The legal solutions which are currently being emphasized are unlikely to resolve the tenure problems.

- Actual and draft laws seek to protect the security of specific groups ("Los nuestros" & "nuestra tierra") instead of establishing a legal framework that establishes universal principles or defers to a social process for coming to some agreement on values.
- Regressive laws are not enforceable. The Sandinistas still control the police and army. Institutions lack the mechanisms to resolve disputes effectively. The titling process is in disarray.
- The existing and proposed legal frameworks only begin to define how compensation issues will be handled, especially the valuation of land and the determination of payment instruments that reflect and hold the values established.

None of the legal proposals in effect, or being proposed, addresses the underlying tensions created by the lack of opportunities for employment/subsistence or the employer/worker conflicts. This suggests even well administered laws are unlikely to resolve the lack of security due to tenure problems.

III. Nicaraguan Agribusiness: Principal Constraints

C. The Land Tenure Situation

The Sandinista "reforms" have resulted in a complex structure of tenure and land holding systems. The distribution of land in farms shown below illustrates the relative importance of different systems, and the extent of Sandinista "reform", especially in the key Pacific plain (Regions II, III & IV).

Distribution of Land in Farms, Percent

<u>Region</u>	<u>APP</u>	<u>CAS</u>	<u>CySS</u>	<u>Small & Medium</u>	<u>Large private</u>
I	8.5	18.7	2.1	50.2	20.5
II	22.7	19.4	3.4	31.5	23
III	29.1	17.6	2	30	21.3
IV	21.6	24.2	8	29.7	16.5
V	14.6	8.6	1.4	39.9	35.5
VI	8.2	8	1	66	16.8
Atlantic	6.7	1	0.1	23	69.2
San Juan	20.2	13.1	2	55.7	9
National	11.7	11.4	1.7	45	30.2

APP = State farms

CAS = Producer collectives

CySS = Credit and service cooperatives

Small & medium = Private farms under 200 manzanas

The importance of state control of organizations in the Pacific plain (where commercial agriculture has always been centered and that is the focus of Sandinista investment), helps to explain the intensity of the debate over ownership. Much of the land titled in La Pinata was also in this region (40% in Region II, with an average size over 650 manzanas), further inflaming passions.

The chart also highlights the need to work with small/medium sized farms in order to improve overall productivity and output.

III. Nicaraguan Agribusiness: Principal Constraints

C. The Land Tenure Situation

The "reformed sector" (cooperatives, collectives, state farms and private titles awarded after the election) has been structured as an enclave highly dependent on government. This approach is the antithesis of an entrepreneurial, independent and self-helping family farm/co-op system. Given the importance of this sector, and the ambitious growth expectations for agribusiness, transformation and modernization is indispensable. Nicaragua cannot afford an underperforming enclave representing nearly half of its agricultural resources, but its constraints to transformation are formidable.

- Co-ops, and especially the Sandinista Cooperatives (CAS) which are producer cooperatives with collective titles, were created top-down by the Government. They do not reflect a grass roots decision by independent farmers to work cooperatively on specific activities (production, marketing, credit, etc.) Instead, there is almost complete dependence on centralized state institutions for inputs, credit, technology and marketing.
- Similarly, the Credit and Service Co-ops (CySS), were often forced on independent small farmers as the only way of obtaining credit and titles.
- The state farms (APP), which are largely former Somoza and related estates, are now being distributed by CORNAP. The process has been far from smooth, postponing the opportunity for much needed investment and active management.
 - Of the 415,745 manzanas held by CORNAP, about 80% have been "transferred": 26% to former owners, 22% to former "contras", 17% to EPS and 35% to workers (as of August, 1991).
 - A visit to HATONIC (the bulk of the land transferred to date) revealed: two farms awarded to EPS officials essentially abandoned; three units returned to former owners operating but with no improvements; and ongoing discussions on the terms of the sale of three units to workers/staff, such that legally constituted business organization has been created and no investments were being made.
 - No criteria have been established for the distribution of land among the various interested parties. Ultimately, the decision is political. While seemingly pragmatic, this contributes to a volatile situation where "might makes right".

Other constraints affecting the reformed sector are further detailed in subsequent sections.

III. Nicaraguan Agribusiness: Principal Constraints

C. The Land Tenure Situation

The key questions and issues related to land tenure that will have to be addressed in formulating an agribusiness strategy include:

- What can be done to re-direct the discussion of land tenure away from a strictly legal/political question of ownership towards the underlying economic issues of competitiveness and expansion?
- Can real grassroot cooperatives or other organizations emerge from the CAS, CySS and worker owned APP units as the basis for modernization?
 - How can support be provided without perpetuating the current centralization and paternalism?
- Will an emphasis on improving labor productivity (possibly through better compensation and a sense of shared "ownership") defuse conflicts while significantly improving output?
 - How can viable management practices and constructive attitudes between owners and managers be implemented?

In summary, economics will ultimately be the key to resolving the land tenure problem. While proper mechanisms for addressing titling and conflicts are critical to promote investment, ultimately the proper pricing of land, labor and capital, together with the creation of new (especially non-agricultural) jobs will reduce the competition for land.

- Over time, the wealthier segment of the population is likely to move into marketing/trade, processing, service and high value production activities which generate better returns on capital than holding large extensions of land for marginally profitable commodities.
- Much of the production of labor intensive crops is likely to be handled by small- and medium-scale farmers.

III. Nicaraguan Agribusiness: Principal Constraints

D. Institutional Framework

The institutional framework in support of agriculture is a direct reflection of the tenure and political situation. Existing institutions reflect us/them, reformed/commercial, Sandinista/UNO divisions, as well as strong centralization. Unfortunately, none of the institutions currently offers adequate services aimed at supporting members/constituents in significantly improving yields and income. The following summarizes the activities of various institutions:

Institution	Principal Focus	Other Activities	Comments
<u>REFORMED SECTOR</u> UNAG	Political representation of small & medium producers (claims 125,000 members, 88,000 in co-Ops)	ECODEPA distributes inputs, manages tiendas campesinas, & buys some grain	Best organized No credit (but planning co-op bank) Effectiveness at grassroots level untested
UCA's (61 with 569 members)	Second story co-Ops	Hope to offer economies of scale (mktg., credit, purchasing, etc.)	Est. 1990, getting organized Ability to support grassroots co-Ops untested
<u>COMMERCIAL SECTOR</u> UPANIC	Representation of producer assoc. (mostly large producers) Cattle, coffee the largest	Minimal services USAID project to finance institutional strengthening services for members	Image is weak, mostly due to lack of services and lack of outreach to small producers/co-Ops
Producer Associations	Representation of medium-large producers	Few offer services; Exceptions: Rice: Mktg. & seeds Non-traditionals: Mktg. advice	"Us-them" division
Regional producer associations	Regional representation	Few offer services, but many interested in tech. assist., credit, etc.	Outreach to members tends to be weak
<u>MIXED</u> National Commissions	Public/private coordination, planning Calculation of production costs Report to MAG (could be privatized)	Activity level varies by commission Some seek to develop mkt. info, R & D, tech. assistance, quality control	Image among producers is mixed Outreach at grassroots level tends to be weak
<u>PUBLIC SECTOR</u> MAG	Policy formulation; planning	Extension (new service)	In reorganization process Seeks major role in tech. transfer

III. Nicaraguan Agribusiness: Principal Constraints

D. Institutional Framework

The primary focus of most institutions is policy advocacy -- lobbying to obtain the most favorable policy decisions possible from the Government. The capability of these institutions to support members in honing their business skills (market information, technical advice, alternative credit mechanisms, etc.) is extremely weak. As the Nicaraguan economy is liberalized, the emphasis on seeking special protection or benefits from government should become less relevant, while the lack of other support services will become a critical problem.

- Small scale producers and co-ops are most affected. Their self appointed support institutions (UNAG, UCAs) tend to be centralized and paternalistic. The capability to deliver services at the grass roots level appears limited. The producer associations tend to focus on medium to large scale commercial agriculture and have not yet developed effective outreach initiatives to broaden their membership.
- Some regional producer associations, or national associations where production is regionally concentrated, seem to have the best potential for developing the necessary services. They are sufficiently close to their members and local conditions to be able to respond with appropriate services. Possibilities include: credit, extension, market information and logistics. The role of the larger national associations or umbrella associations (UPANIC) is to provide "second tier" support and representation on policy matters.
- The mixed Commissions seem to have support from producers as vehicles for policy analysis, strategic planning, and applied research. The key to this support is majority private sector representation on the Commissions.
- Most producer associations and Commissions focus on single, or closely related products. Their mission is to support these products at all costs. However, in some regions, the key issues facing agriculturalists are which products will give them the best returns. There are no institutions (with the possible exception of APENN and the Non-Traditional Commission) that help producers review alternatives and implement solutions.

The question to be addressed in formulating a strategy is what kinds of institutions will be needed to act as catalysts and implementing vehicles of private investment led revitalization, and which existing institutions could be reconfigured/reshaped/reoriented to play a constructive role.

III. Nicaraguan Agribusiness: Principal Constraints
E: System Dysfunctions

A number of basic dysfunctions apply to most, if not all, agribusiness systems in Nicaragua. Most critical are:

- The importation and distribution of inputs
- Distribution and marketing
- Financial intermediation

The fundamental problem in each case has been the nationalization and concentration/centralization of these functions. Central direction from the state is only just starting to be reduced.

- **While government vs. private control is a crucial issue, more important is the lack of functioning and competitive markets, a problem which dates back to before the Sandinista period. This has resulted in poor service and lower prices to the farmers.**
- **A related problem is that producers may not have adequate incentives to improve productivity. The additional investment required (in inputs, equipment, technology) appears not to generate an adequate return (especially after factoring in risk).**
- **One solution to the productivity problem is closer linkage between suppliers, producers, and participants in the distribution and marketing of commodities and foodstuffs, where each has a vested interest in the other's success. These symbiotic linkages, that provide mechanisms for transferring technology, improving quality and providing credit, are currently very weak.**

III. Nicaraguan Agribusiness: Principal Constraints

F. Input Distribution

As indicated below, state-owned companies have played a dominant role in the importation and distribution of agricultural inputs. A few private companies have continued to operate, specializing in name-brand products sold to larger scale producers. Importing and distribution is being opened to private firms, although ENIA maintains a legal monopoly on chemicals. The state owned retailing company is up for sale.

Product/Institution	Mkt. size	Import	Mixing/Processing	Distribution
<u>Agricultural chemicals</u>	Fert. \$23 MM Pesti. \$45 MM			
ENIA (State owned)		Official monopoly Can license others 100% fertilizers Most generic chemicals	1 fertilizer mixing plant	
Servicio Agrícola Gurdian		Name brand chemicals	Fertilizer mixing (CFS-Corinto) Pesticide Mixing (Leon)	16 branches
CISA-Agro		Name brand chemicals		Branches
Pro Agro (State owned) (to be sold)			Pesticide mixing	12 branches (was 35) 50% retail fertilizer mkt. 25% pest/herbicide mkt.
Others (ECODEPA-UNAG, BANANIC, emerging firms) 13 members of ANIFODA		Beginning to import directly		Some capability for distribution
<u>Agricultural equipment</u>	300 tractors			
Agro maq (State owned)		Soviet machinery Light implements		Machinery sales
Re-emerging private dealers		Western tractors/machinery		Dealers- major cities

III. Nicaraguan Agribusiness: Principal Constraints

F. Input Distribution

The major problem with the distribution system is that inputs are sold at retail at up to 2.4 times the C!F price. This is primarily due to the lack of competition. The pricing structure for 1990 is illustrated below as percentages of CIF value:

	<u>Duty free items</u>	<u>5% tariff</u>	<u>15% tariff</u>	<u>20% tariff</u>
CIF Value	100%	100%	100%	100%
Bank charges	5.5	5.5	5.5	5.5
Customs charges (incl. tariff)	0.12	8.12	18.12	23.12
Port charges	1.5	1.5	1.5	1.5
Registration & Unforeseen	1	1	1	1
Transport	0.75	0.75	0.75	0.75
Warehousing	0.25	0.25	0.25	0.25
CIF + landing costs	109.12	117.12	127.12	132.12
Financing CIF	15	15	15	15
Financing (Landing)	1.37	2.57	4.07	4.82
Total Cost	125.49	134.69	146.19	151.94
Margin - Importer	1.25	1.35	1.46	1.52
Importers Sales price	126.74	136.03	147.65	153.46
Transport	0.6	0.6	0.6	0.6
Margin- Distributor	36.37	39.04	42.37	44.04
Distributors Sales Price	163.71	175.67	190.62	198.1
Bank guarantee	3.77	4.04	4.38	4.56
Retailers margin	32.74	35.13	38.12	39.62
Retail price to farmer	200.22	214.84	233.12	242.28

In addition to high margins to several intermediaries, retail prices are heavily affected by financial costs and tariffs. The financial costs include the guarantees required from importers by the Central Bank, and the guarantees provided by the BND to producers. Although high prices discourage the use of inputs, the 100% guarantees provided by the BND (instead of cash credit) may encourage producers to use more inputs than necessary and/or the wrong mix of inputs. Also, poor quality and obsolete inputs are being utilized.

Although new players are being allowed, the question for strategy formulation will be how to stimulate greater competition and efficiency in the distribution of inputs. Furthermore, the question is whether these suppliers can also become agents of change (by supporting the use of new technologies and offering an alternative source of credit.)

III. Nicaraguan Agribusiness: Principal Constraints

G. Marketing

Although marketing is extensively reviewed for each of the agribusiness systems, the impact of the nationalization and centralization of marketing under the Sandinistas applies to virtually all systems. Government monopolies were established for most export commodities while ENABAS (and to a lesser extent NICARROZ) allowed the state to play a dominant role in basic grains.

While the express intent was to eliminate the supposedly "unscrupulous intermediary" (a traditional "scapegoat" in developing economies), the consequences of this system have mostly been negative.

- The possibility of a mutually beneficial buyer-supplier relationship was virtually eliminated. In other words, buyers wanting to ensure themselves of reliable or high quality supplies would have an incentive to work closely with regular suppliers (producers), providing purchase contracts, technical assistance, inputs, and/or credit.
- The incorporation within one institution (ENABAS) of the incompatible objectives of simultaneously providing cheap food to the urban population and high prices to farmers inevitably leads to seasonally shifting priorities and contradictory policies. The ultimate impact was lower prices for producers of corn and beans and different production patterns than would have otherwise been the case.
- Farmers often perceive they are being taken advantage of and have no legal recourse. Without competition, there is little incentive for intermediaries to offer better service or information to producers.
- "Transportistas", a class of intermediary the system was intended to eliminate, nonetheless survived and have re-emerged in the post-Sandinista period. The producers are receiving a service they perceive as better than the state alternative, but it may be inferior to what should be available under free and open competition. For example, a transportista reports that he can buy cattle at C\$1,200 each and make a profit of C\$15,000 on a truckload of 17 head. The implication is that a producer without the wherewithal to deliver to premium price markets is not receiving the best possible price.

This situation is due to change as the role of ENABAS is reduced and private traders are licensed for export products. However, marketing agents are still being viewed as a necessary evil (as indicated by the licensing process) rather than as critical and potentially progressive agents of change. Facilitators that can provide low cost access to markets, while developing close linkages with producers, should be aggressively encouraged.

III. Nicaraguan Agribusiness: Principal Constraints

H. Financial Intermediation

Agricultural credit mechanisms in Nicaragua are among the most dysfunctional aspects of the agribusiness system, a situation brought about by the nationalization of the banking system and the macro-economic and sectorial policies of the past decade. What is wrong with the system can be illustrated with the following indicators:

- **Loan recovery rates (percent of total)**

<u>Year</u>	<u>Cotton</u>	<u>Coffee</u>	<u>Rice</u>	<u>Corn</u>	<u>Bean</u>	<u>Sorghum</u>	<u>Cattle</u>	<u>Long term</u>	<u>Total</u>
1989	14	35	31	35	15	31	21	24	24
1988	3	32	20	42	12	15	25	5	16
1987	28	49	43	56	29	49	44	28	38

- **The political allocation/ratloning of credit by the Government, with quotas assigned by commodity and, until this year, by type of agricultural organization (with state farms and co-Ops receiving a disproportionately high share). One major implication is that the amount of land dedicated to various products is highly dependent on political decisions, rather than the underlying market forces.**
- **The reliance on one institution -- the Banco Nacional de Desarrollo (BND)-- to provide virtually all formal credit. Not only has there been no competition from other banks, but unlike most countries, there are no formal non-bank sources of finance (suppliers, buyers, etc.) Informal lenders appear to be primarily "transportistas" acting as intermediaries between small firms and private merchants.**

However, Nicaragua is somewhat unique in that availability of credit has not been a major constraint. If anything, credit has been provided too liberally. The problem has been that the politically driven credit allocation system has had a major impact on the decisions made by farmers.

- **Since many small producers need credit to live from (until their crop is sold), they will produce whatever crop credit is available for. As an example, this helps explain small scale farms inefficiently and unprofitably producing cotton.**
- **If tight credit policies continue to be necessary (due to government deficits), the impact of the current system will become even more severe, since the more promising producers and commodities will not necessarily have easier access to credit than the "losers".**
- **It appears that the attempt to impose stricter discipline on borrowers, coupled with mortgages on farms, is threatening to small farmers, especially beneficiaries of agrarian reform, who fear losing their land through loan defaults.**

III. Nicaraguan Agribusiness: Principal Constraints

H. Financial Intermediation

The 1991/92 process for providing credit to producers can be summarized as follows:

- BND finances 70% of the anticipated revenues for the average producer at a certain level of technology (e.g. technified vs. traditional; irrigated vs. dryland), based on average yields for the past three years and average production costs negotiated by the National Commissions and the Ministry of Agriculture.
 - **The major problem is that this approach fails to consider potential returns, regional differences or to reward efficiency. It is a paternalistic formula based allocation system rather than an investment system.**
- Up to 40% of the financing is in the form of a guarantee for the purchase of inputs, with the balance provided in cash with a monthly disbursement schedule according to when the credit is likely to be needed.
- The BND provides financing to the state-owned marketing companies (and BANIC in the case of ENABAS) to buy from the producers. The checks for the producers are made co-payable to the BND, which deducts its interest and principal as well as the costs and finance charge (1% per semester) for the inputs. The balance is paid in cash to the producer.
 - One impact has been the tendency of some growers to avoid ENABAS, ENCAFE or other state entities, sell to illegal intermediaries, and not to repay the loan. This helps explain high default rates and may contribute to apparent declines in production as reported in official statistics.
- The BND pays the input supplier directly.
 - Private input distributors are receiving 180 days to one year payment terms from foreign suppliers.
- Producers are required to provide financial or crop guarantees for short term loans and mortgage guarantees for long term loans. The BND claims it will begin to execute guarantees this year and require a good payment record.

III. Nicaraguan Agribusiness: Principal Constraints

H. Financial Intermediation

For 1991/92, the Government announced a credit program that would disburse C\$806 million through the BND. However, it is assumed that C\$626.5 million, or 78%, would come from collections. Since this is very high by recent standards, the actual amount available could be significantly lower (unless the Central Bank provides additional financing).

The Government's agribusiness related lending program, in millions of Cordobas Oro, is as follows:

	<u>Disbursements</u>	<u>Collections</u>
BND	806	625.5
Crops	360.6	215.0
Livestock	107.9	60.0
Pest Control Program	12.5	0
Trade finance	225.	325
Ag. Chemicals	100	26.5
BANIC		
ENABAS	125.55	50.0
FNI		
Conazucar	125.0	25.0
Long Term - FNI		
Coffee	50	0
Cattle	50	0
Ag. Equipment	25	0
Non-traditional	25	0
TOTAL	1,206.55	700

Minor amounts of funding are available from other sources:

BANIC Occasional loans for coffee and cattle

FNI: FOPEX: \$ 3 million for melons and non-traditionals (Scandinavian funding)
 PROCOOP: \$750,000 for grupos solidarios and guarantees to coops, through BND and BANEX (EC funding)
 BCIE/Agroindustry: \$4 million available

III. Nicaraguan Agribusiness: Principal Constraints

H. Financial Intermediation

Looking ahead, the most profitable commodities (especially on larger farms) are likely to receive financing from the new commercial banks and trading companies being licensed. Small scale farmers may face more of a crunch as the BND restructures and they are forced to use credit more carefully. The major bottleneck, however, is medium and long term financing for recapitalization and new investment. Foreign sources could provide part of the answer (for export crops) but the facilitating mechanisms are not yet in place. Some of the possible financing alternatives are reviewed below:

Institution	Plans	Comments
BND	<ul style="list-style-type: none"> ● Recapitalize (Restructure 215 MM in loans, foreign debt) ● Seek more operational autonomy ● Capitalize on 25 branches and "agencias rurales" ● Streamline and introduce management systems ● Focus on small-medium scale producers 	<ul style="list-style-type: none"> ● Planning for restructuring is incipient ● Has not operated as a real bank ● Ability to maintain discipline in recovering loans (given political pressures) may be difficult ● High level of decentralization (each branch a profit center) may be required
FNI	<ul style="list-style-type: none"> ● Seeking additional funds for non-traditionals ● Doing more retailing of loans 	<ul style="list-style-type: none"> ● Only source of medium term loans, but availability is extremely limited ● Credits to melons have been unsuccessful
New private banks	<ul style="list-style-type: none"> ● Several commercial banks expected (three already approved); likely to finance imports/exports and commercial producers. ● At least one merchant bank for agriculture being designed; longer term financing for investment projects ● At least one leasing company being designed 	<ul style="list-style-type: none"> ● While a major step forward, these banks will take time to come on stream and are likely to be modest in size; with an average of \$2million in capital, total loans per institution will be \$10-15 million, of which only part will go to agribusiness ● Small producers will benefit least
Coops	<ul style="list-style-type: none"> ● Limited EC funding for coop credit (\$750,000) 	<ul style="list-style-type: none"> ● Credit coops, in which member savings are tapped, have not really been explored.
UNAG	<ul style="list-style-type: none"> ● Exploring two options: 1) create a commercial bank with outside capital; or 2) create a coop bank 	<ul style="list-style-type: none"> ● Ideas not well thought through
Foreign	<ul style="list-style-type: none"> ● Interested in debt/equity swaps for export projects ● Possibility of discounting export contracts 	<ul style="list-style-type: none"> ● Negative pledge clause with commercial banks, and lack of Central Bank support limit options

III. Nicaraguan Agribusiness: Principal Constraints

I. Human, Technological and Physical Infrastructure

Much of Nicaraguan agribusiness has difficulty competing in domestic and world markets because its costs are high and productivity low. In some cases, these problems are caused by exchange disparities or lack of investment capital. In others, they can be categorized as infrastructural (human and physical), including:

- **The obsolete or inadequate skills, attitudes and know-how of human resources at all levels.**
- **The lack of applied research and development to provide information, appropriate technology and know-how.**
- **Transportation bottlenecks, especially farm to market roads in the interior and adequate road access to an Atlantic port.**
- **Antiquated and inappropriate agricultural equipment.**
- **Expensive and insufficient or poorly maintained irrigation systems for high value crops in the Pacific region.**

The most critical of these, the human and technology factors, are further outlined below.

III. Nicaraguan Agribusiness: Principal Constraints

I. Human, Technological and Physical Infrastructure

Human resources must be highlighted as a crucial impediment to improved performance in agribusiness. While difficult to quantify, field visits and interviews have led to the following concerns:

- **At the management/large scale ownership level**, managerial and technical "know-how" for improving the competitiveness of Nicaraguan agribusiness is very low. Not only has there been a significant "brain-drain", but technology and management practices tend to date back to before the revolution. Given extremely rapid changes in world markets, technologies and management practices, Nicaraguans are at a great disadvantage. Examples include:
 - Coffee farmers that lack the management vision to understand the role of labor productivity or how to improve it.
 - The absence of new pest management practices in cotton and the growing dependence on chemicals.
 - The tendency to seek more government protection/support, rather than focus on lower costs/higher yields.
- **At the small scale producer and co-op level**, the level of technology and management skills is extremely rudimentary. Even modest improvements in practices should have a dramatic impact on yields.
- **At the worker level**, very low productivity caused by some combination of imperfect politicization, low remuneration, and poor training in proper practices.

The agribusiness strategy will have to consider how to address this human resource problem. If the process is to be private-sector led (small and large scale), the management and technical capability of individual agribusiness managers will be critical.

III. Nicaraguan Agribusiness: Principal Constraints

I. Human, Technological and Physical Infrastructure

Technology requirements are generally known and available, although not always in Nicaragua. Thus, the principal challenge involves technology transfer more than basic and applied research. While applied research is important to generate appropriate technologies for specific Nicaraguan micro-regions, the principal constraints are:

- The lack of mechanisms or entities within the agribusiness systems, with vested interests in the transfer of appropriate technologies. This is largely due to the government intervention in marketing and the distribution of inputs. Furthermore, companies and entities have not had any incentives to develop and commercialize appropriate technologies.
- Inadequate returns to producers, in terms of increased yields and profitability, from the investment in new technology. This can be attributed to: poor management, inappropriate technology and lack of premium prices for better quality. The result is poor incentives to adopt improved technologies.

The implication is that functioning agribusiness systems which reward participants for improved productivity and quality, as well as for selling appropriate technology, is the key to addressing the technology problem. Promoting investment by companies with relevant technologies is a critical aspect of this process. While R&D facilities are important, especially over the medium term, using markets to encourage transfer and adoption of technology, appears more effective over the short term.

IV. Commodity Systems

A. Introduction

In order to facilitate the assessment of opportunities and constraints, a number of agribusiness systems have been analyzed in detail. Agribusiness systems incorporate interrelated segments (marketers, distributors, processors, handlers, producers, input suppliers) within each one of which are individual participants, competing for market share.

For each of the systems analyzed, the focus has been on understanding the following key aspects:

- Markets and market trends
- Structure - key components and participants and their inter-relationships
- Prospects and issues, emphasizing business potential and competitiveness (and related constraints)

The principal systems profiled below (and in more detail in Volume II) are:

- | | | |
|--|---|--|
| ● <u>Traditional Diet</u>
Corn
Beans
Rice | ● <u>Modern Diet</u>
Broilers
Sorghum | ● <u>Export Markets</u>
Coffee
Cotton
Bananas
Melons (as an example
of non-traditional exports) |
|--|---|--|

The only major systems not profiled are cattle, subject of a separate USAID financed report, and sugar, that, in common with most countries, developed or developing, is heavily administered and whose future depends primarily on the domestic market, with a possible bonus from high-priced, concessionary quotas such as that for the U.S.A.

IV. Commodity Systems

B. Basic Grains

Basic grains are produced primarily for the local market, for direct human consumption. About half of domestic production is consumed on the farm or in rural areas whose total population is estimated to be 1,500,000. The surplus is sold into the urban market that procures the deficit from international sources, mostly donations, in the form of close substitutes.

The approximate market size (1990) is shown below in tons.

	<u>Commercial Sales</u>	<u>Donations</u>	<u>On-farm consumption</u>	<u>Total Use</u>
CORN	198,000	40,000	115,000	239,000
BEANS	54,000	3,000	30,000	53,000
RICE	71,000	35,000	22,000	112,000
SORGHUM	60,000	38,000	66,000	94,000

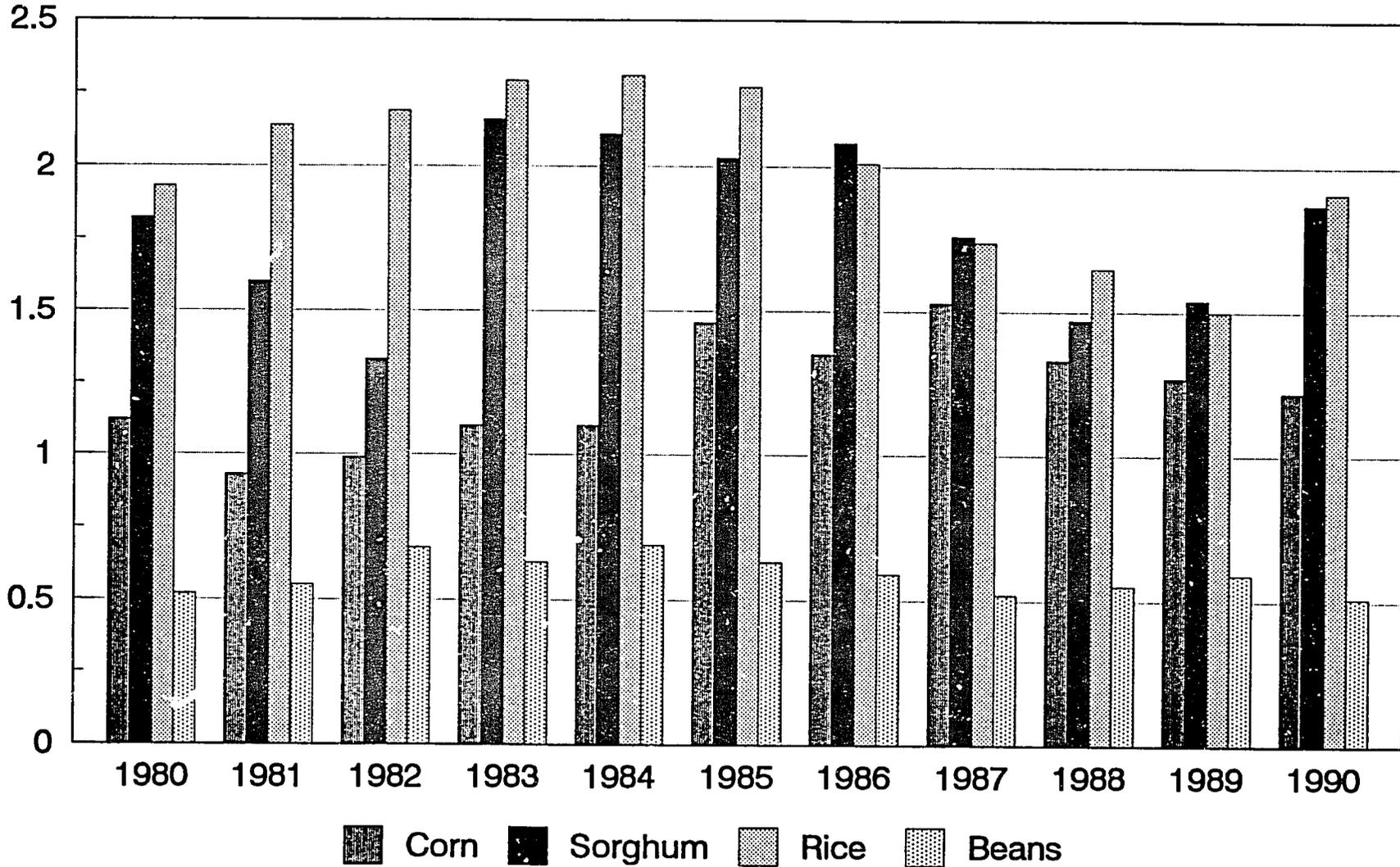
Sorghum, and off-grade corn, are used for animal feed. In 1990, an estimated 28,000 tons of sorghum and 10,000 tons of corn were sold to feed mills.

- Sorghum for feed is down about 60% over recent years due to the contraction of the poultry industry.
- Generally, corn is consumed as food, with only low quality grain sold for feed.

After experiencing improvement in the early 1980s, yields have been declining since the middle of the decade (see figure).

Yields for Basic Grains

(MT/Ha)



IV. Commodity Systems
B. Basic Grains

Under current policies, production of basic grains is likely to remain stagnant over the coming decade, with only beans, and to a lesser extent sorghum, expanding slightly.

- **Given rapid population growth, the implication will be greater reliance on off-shore sources, and a probable shift to wheat flour.**

Under a neutral policy framework, involving significantly less government intervention, basic grains are projected to increase about 4.4% per year, with beans expanding in response to a market price 50% higher than the current one.

- Low cost, traditional producers could eventually expand production to the point exports were possible. For example, bean costs are competitive and producer returns would be attractive at regional prices.
- There is also potential to re-establish the feed-grain complex, reduce feed production costs and improve competitiveness in international markets while increasing poultry sales.
- Domestic resource costs are favorable for beans (so foreign exchange savings from expanded production are high). They are modest for mechanized sorghum and non-mechanized rice; unfavorable for mechanized corn or rice.
- Projections under current and liberalized policies are presented in detail in Volume II, Section V.

The markets, structure and outlook/issues for each of the basic grains is summarized below and presented in more detail in Volume II, Section III.

IV. Commodity Systems

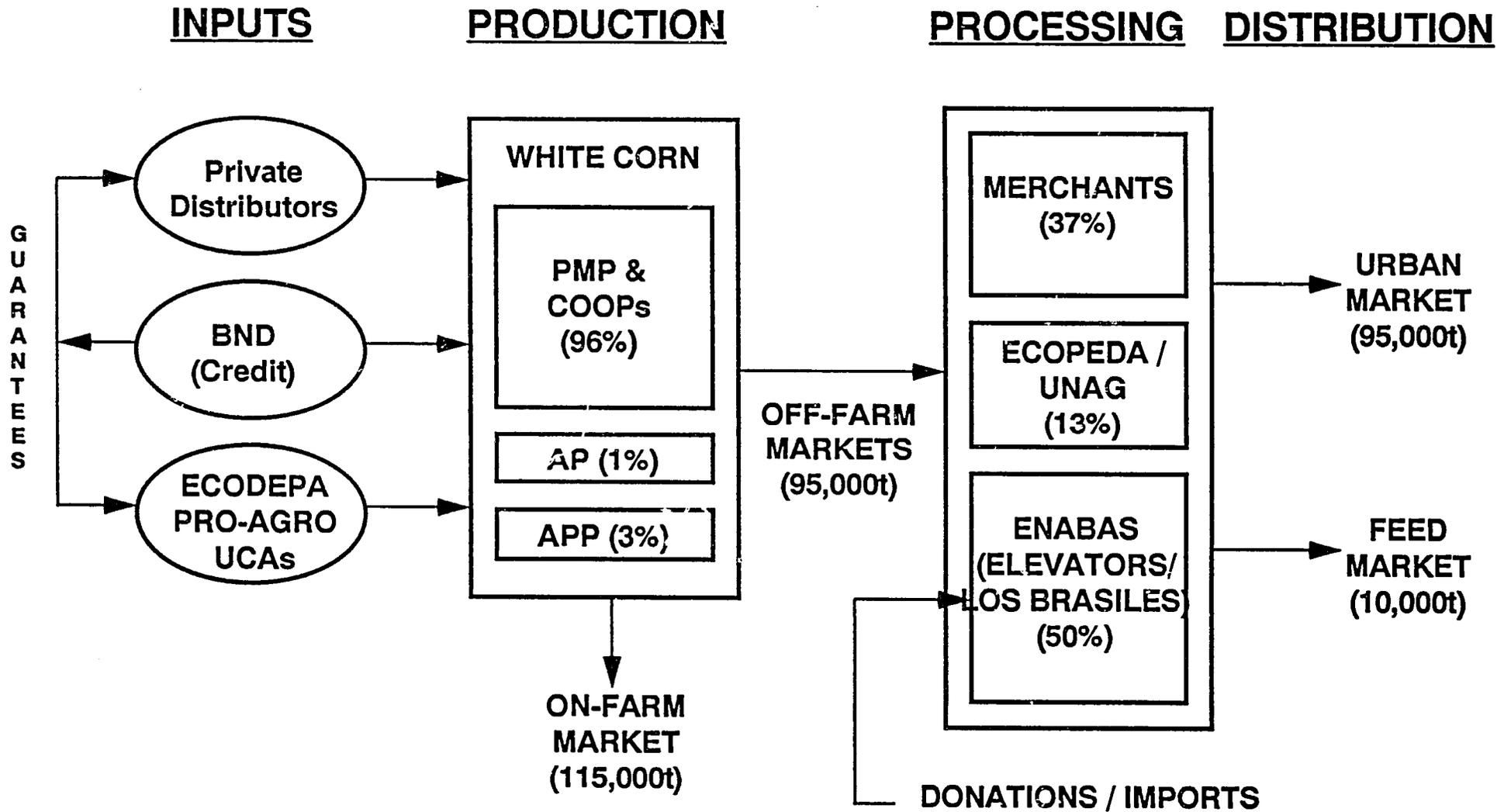
C. White Corn

The current domestic corn use is estimated at about 225,000 tons (5 million cwt), reflecting a growth rate of 3.2% per year between 1980-1990 in line with population growth. This market can be segmented as follows:

- **Current on-farm market of 115,000 tons**, assuming rural per capita consumption of 210 grams per day.
 - Consumption is projected to grow in line with rural population at 2.4% a year to 145,000 tons.
 - Corn is perceived as the basic subsistence crop by many farmers who primarily grow it for food, selling only the surplus.
- **The urban market is limited by availability and income:** per capita consumption fell from 130 to 110 grams per day.
 - As incomes have declined, consumption of corn has been relatively stable while rice, wheat flour and sugar use has declined.
 - Projected growth of at least 4.0% per year.
 - Yellow corn is imported in irregular patterns, based on availability, and local crops.
- **The feed use about 10,000 tons**, is projected to increase to 15,000 by 2000.
 - Only corn that has degraded in storage is sold to feed mills.
 - Imported yellow corn, intended for humans, has recently been sold to feed compounders.

About 75% of corn is consumed in the form of tortillas. In urban areas, primitive bakeries make tortillas daily, while other small businesses prepare "necatamales" weekly. Drinks made from powdered corn mixed with sugar are also popular.

Corn System: Total Market (225,000t)



IV. Commodity Systems

C. White Corn

The principal problem facing corn, 96% of which is produced on small and medium farms (including co-Ops), is unfavorable technology and yields. The current C\$38.60 per cwt barely covers fully allocated costs.

<u>Farming method</u>	<u>Costs per manzana</u>	<u>Revenue per manzana</u>	<u>DRC (C\$5=\$1)</u>
Hand labor	C\$ 35.99	US\$9.25	4.45
Using oxen	C\$38.64	US\$0.64	4.83
Using tractors	C\$41.16	US\$26.00	5.38

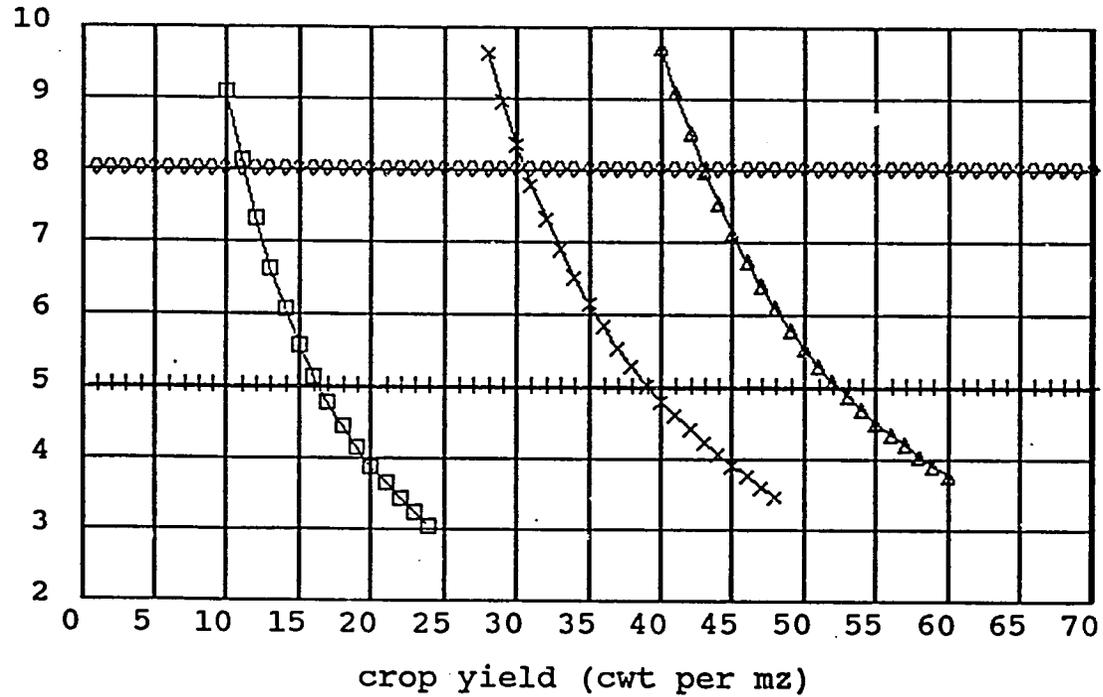
In order for corn to be competitive, yields would have to be higher:

<u>Farming method</u>	<u>Required yields</u>	<u>Current yields</u>
Hand labor	20-25	PMP - 15-20 (avg. hand labor and oxen) AP - 20-40 APP- 30-55
Using oxen	40-45	
Using tractors	55-60	

Since corn is grown primarily for subsistence, cash returns from improved practices would be marginal on many farms, and thus policies designed to stimulate improved yields would be difficult to justify (see figure). Furthermore, given comparatively low world prices, production is a high cost option for supplying the urban market, while offering poor income prospects to farmers.

Domestic Resource Cost as a Function of Yield
Corn Using Alternative Technologies

Cordobas per \$



- DRC (using hand labor)
- × DRC (using oxen)
- △ DRC (using tractors)
- + official exchange rate
- ◊ equilibrium exchange rate

IV. Commodity Systems

C. White Corn

ENABAS purchased about half the corn sold off the farm in 1990 and all imported yellow corn. ECODEPA (a UNAG subsidiary) purchased about 13%, with the balance bought by merchants and "transportistas". Additional characteristics of the corn trade system include:

- ENABAS has historically paid above market prices during the harvest, and sold below the wholesale price especially in the quarter before the new crop (thus holding inventory for most of the year.) The resulting losses are not known.
 - This is the opposite of a "carrying charge" grain market where the price bid to producers typically reflects some future wholesale price discounted to cover the cost of storage and finance.
- Three categories of facilities, managed by ENABAS, offer adequate national storage capacity for corn and sorghum:

<u>Category</u>	<u>Upright bins - bulk storage</u>	<u>Godown - bag storage</u>
5 regional elevators (2 idle)	1,276,800 cwt.	333,700
51 satellite (DAPs)	1,179,000	618,000
Los Brasiles (for imports)	1,000,000	200,000

- ENABAS receives corn in bags or bulk at its DAPs or regional elevators where it is conditioned and stored in bulk, then transported to Managua for bagging and delivery to wholesale outlets.
 - Corn handling by private merchants/transportistas is entirely bagged. The transportistas provide a key service by providing small farmers with bags, shelling equipment and apparently, credit.

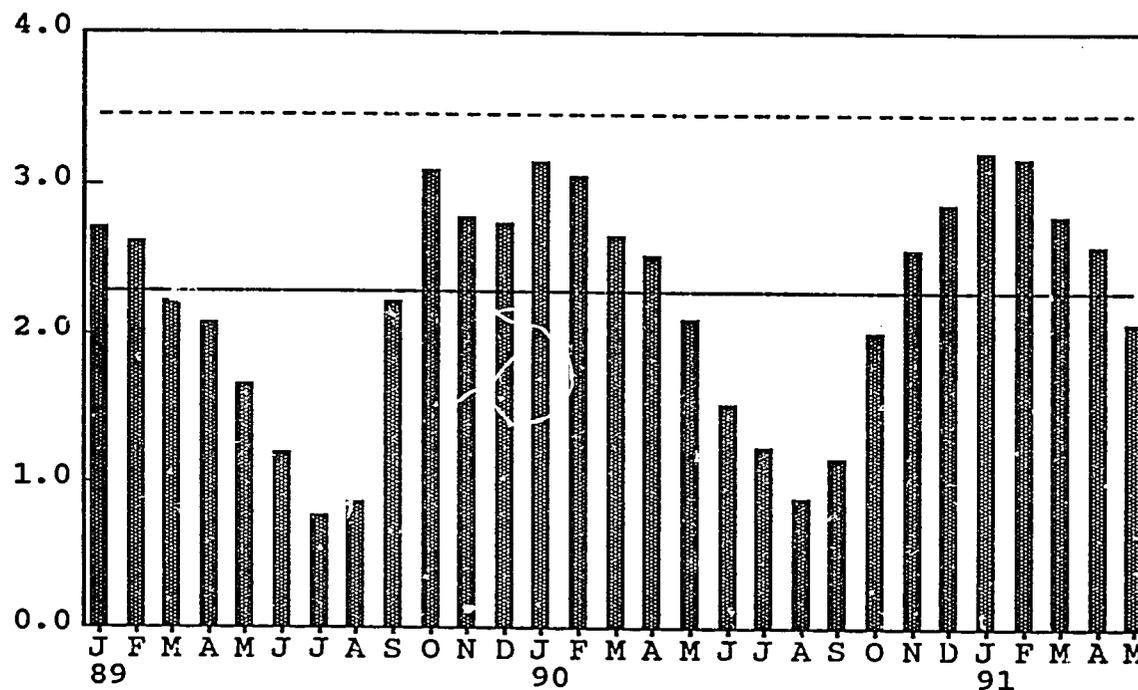
In 1991/92, ENABAS proposed strategic changes including: greater support for corn (away from sorghum); and divestiture of its DAPs in order to focus on the regional elevators.

- ENABAS is ill-suited to handling corn. It has limited direct contact with small corn producers and does not provide services such as bags, shelling, transport and credit. Divestiture of the DAPs would exacerbate the problem.

Grain Storage Capacity (Upright Bins)

(million cwt)

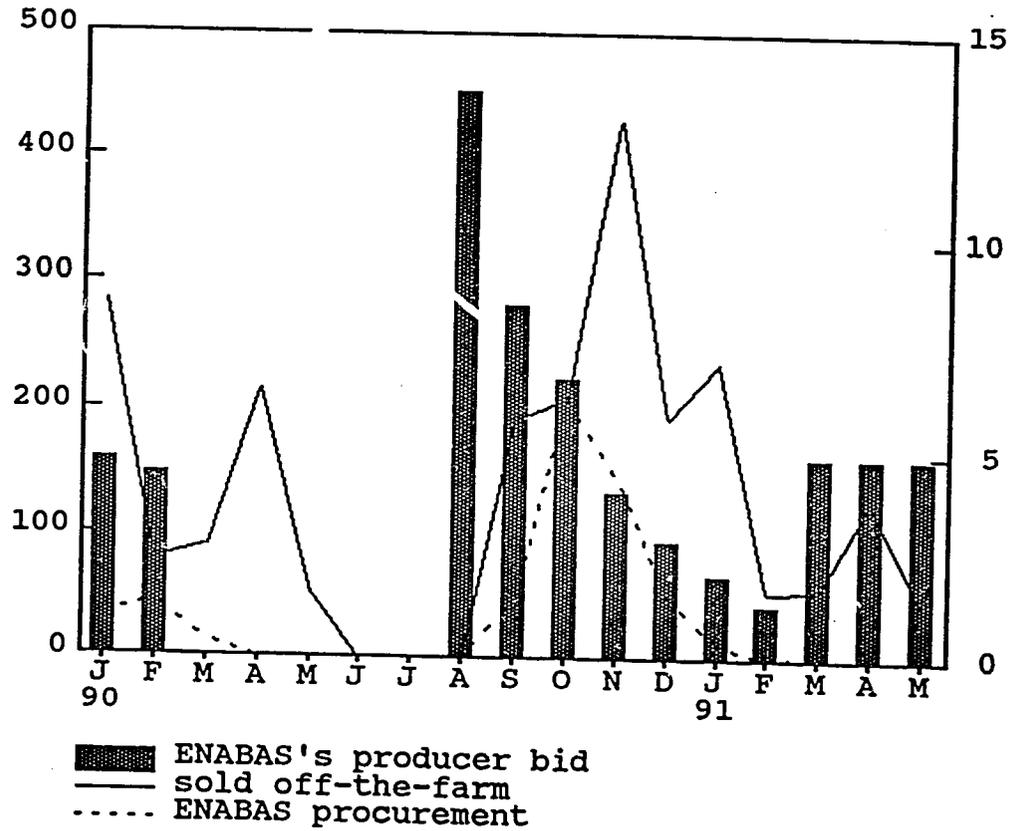
Thousands



corn + sorghum carryout
 terminal upright capacity
 total upright capacity (incl DAPs)

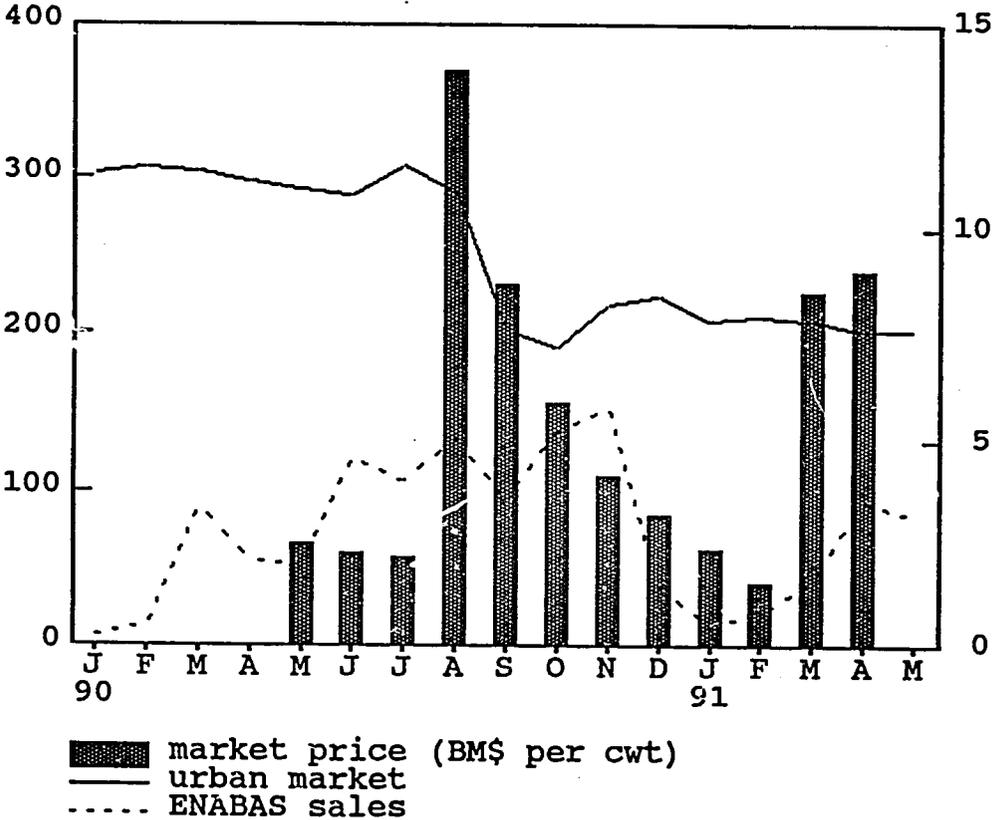
Corn
Sales Off-the-Farm & ENABAS Procurement

k cwt



Corn
Urban Market & ENABAS Sales

k cwt



IV. Commodity Systems
C. White Corn

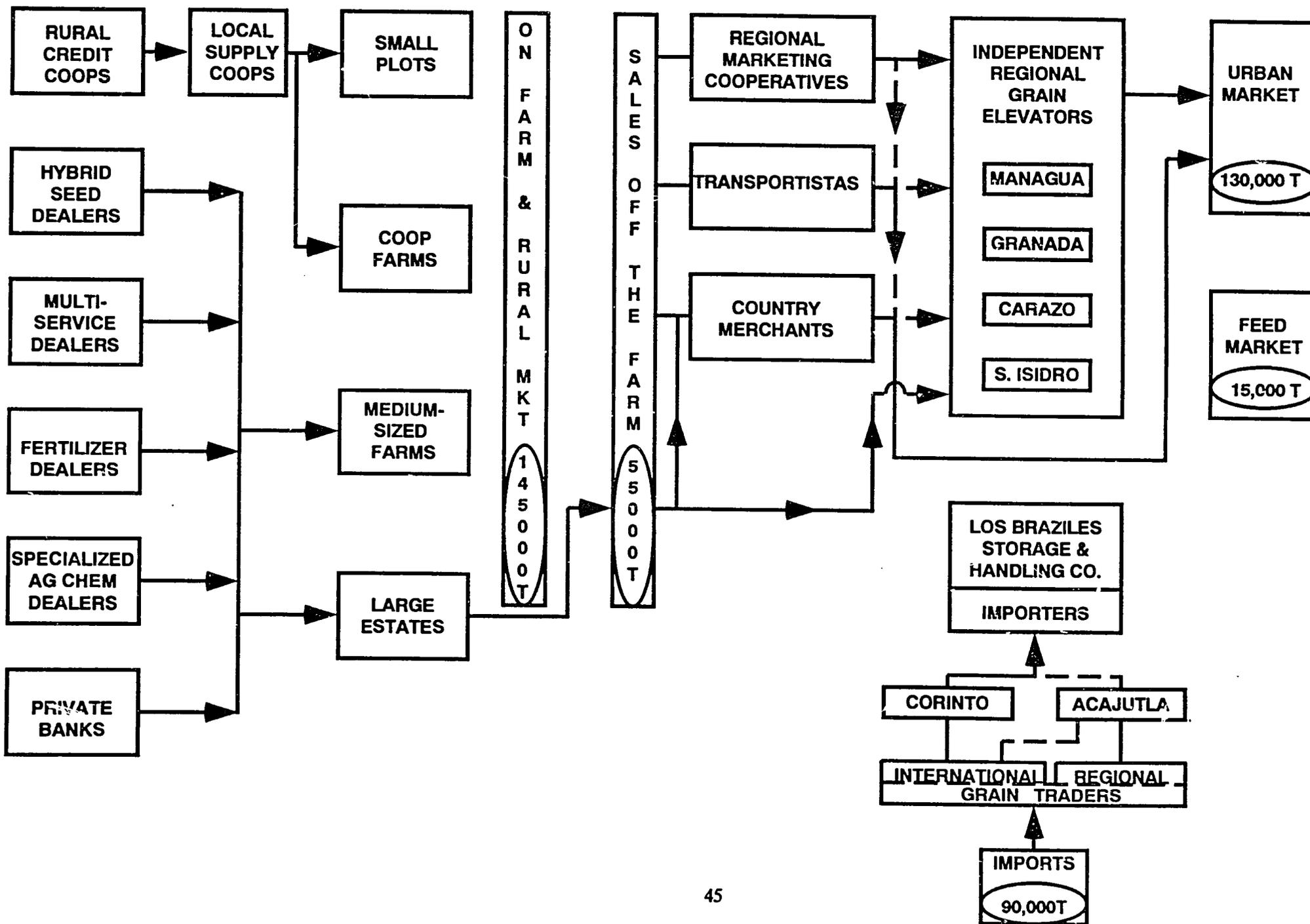
At the policy level, the question of feeding the urban population is best uncoupled from the issue of farm income. While corn is likely to remain a subsistence crop, it is not now an efficient, low-cost source of food for the urban population.

- Over the long run, the government should enable private commodity traders and food companies to supply the urban market with a variety of dietary items at least cost, irrespective of their source. (Trends throughout Central America suggest a shift from corn to wheat flour, and the substitution of bread for tortillas.)
- In the medium term (1995 onwards), new varieties of corn could improve yields enabling farmers to release more land to grow higher revenue producing crops such as beans or vegetables.

ENABAS should be transformed into a small number of investor-owned corporations, that would continue to handle, dry and store bulk corn sold off-the-farm destined for the urban market.

The following figure indicates how the Corn System is likely to evolve by the year 2000 as compared to the current structure.

Corn System 2000



IV. Commodity Systems

D. Edible Beans

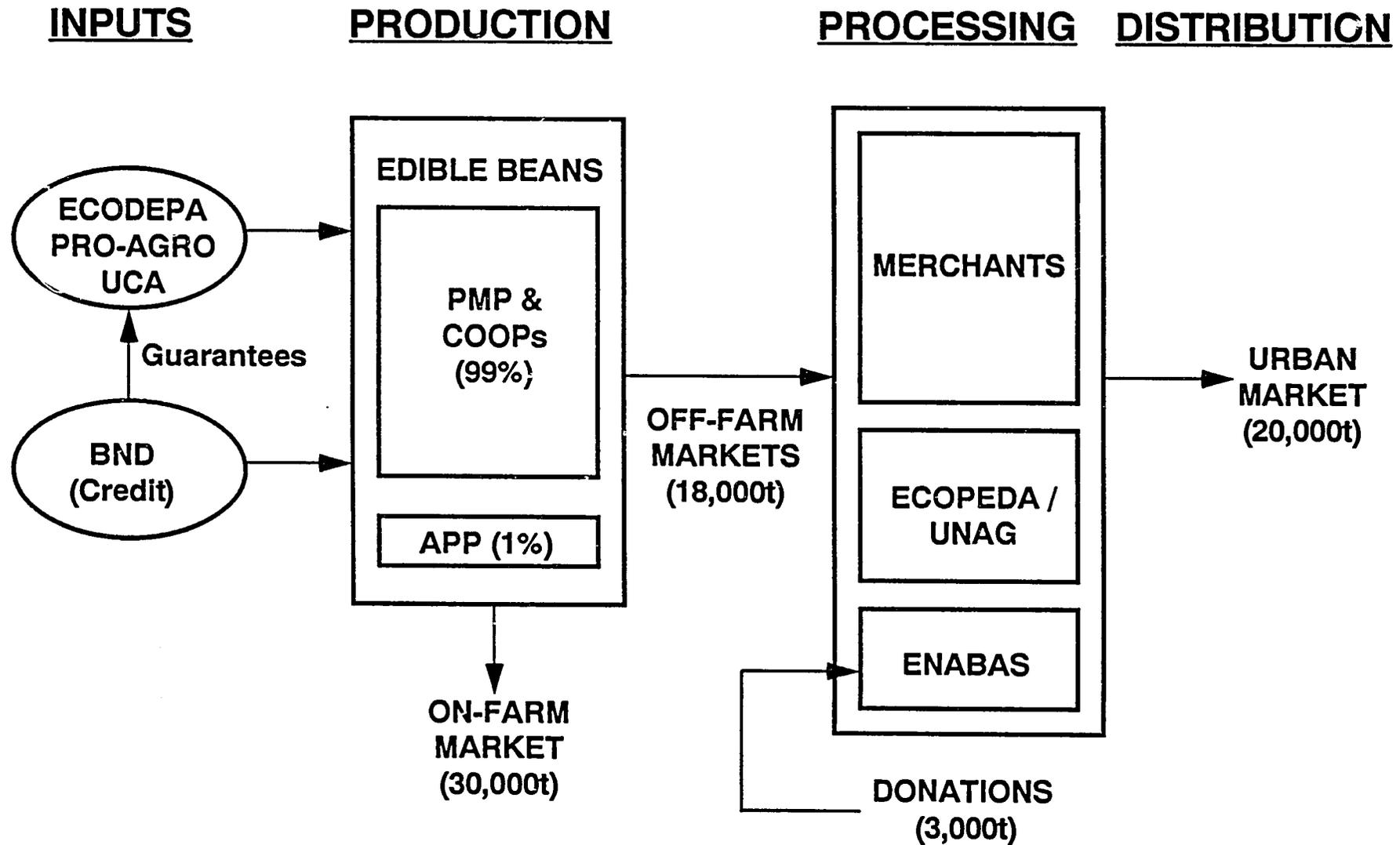
The total use is about 53,000 tons, and has expanded about 3.0% per year. Distinct on-farm and urban market segments can be identified:

- **On-farm consumption is about 30,000 tons, or 55 grams per person per day. It is projected to grow at about 2.3% per year, in line with rural population growth, and reach 38,000 tons by 2000.**
- **Urban consumption per capita declined slightly in the 1980s, but is currently about 23 g per day. Since meat consumption has declined due to lower income levels and is unlikely to recover soon, bean consumption is projected to increase 4.3% annually in the 1990s.**

At the wholesale level, urban merchants provide bags and transportation, either directly or through a transportista. The beans trade is a cash business characterized by wild price fluctuations, making speculation dangerous (see figure).

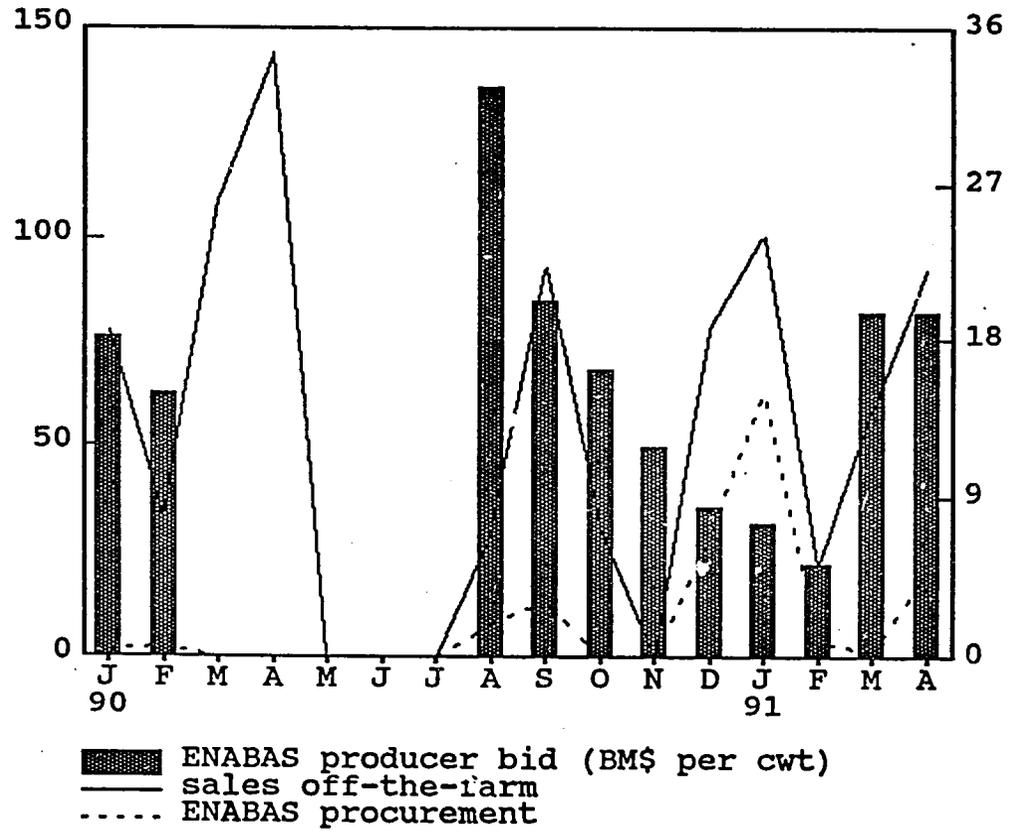
- ENABAS historically handled few beans until ordered to supply them to demobilized elements of the two armies. ENABAS made modest purchases in 1988/89, almost none in 1989/90 and active purchases in two months in 1990/91 (see figure).
 - In 1990, ENABAS generally priced its beans above the free market price, except in August when it was slow to readjust to the price leap. Its ex-farm price initially outbid the market, but failed to adjust to inflation.
- The combination of an exportation in Nicaragua and a drought in El Salvador drove the San Salvador price to about \$40 per cwt, about twice the Nicaraguan price. In consequence, pressure has built for illegal cross-border movements.

Bean System: Total Market (50,000t)



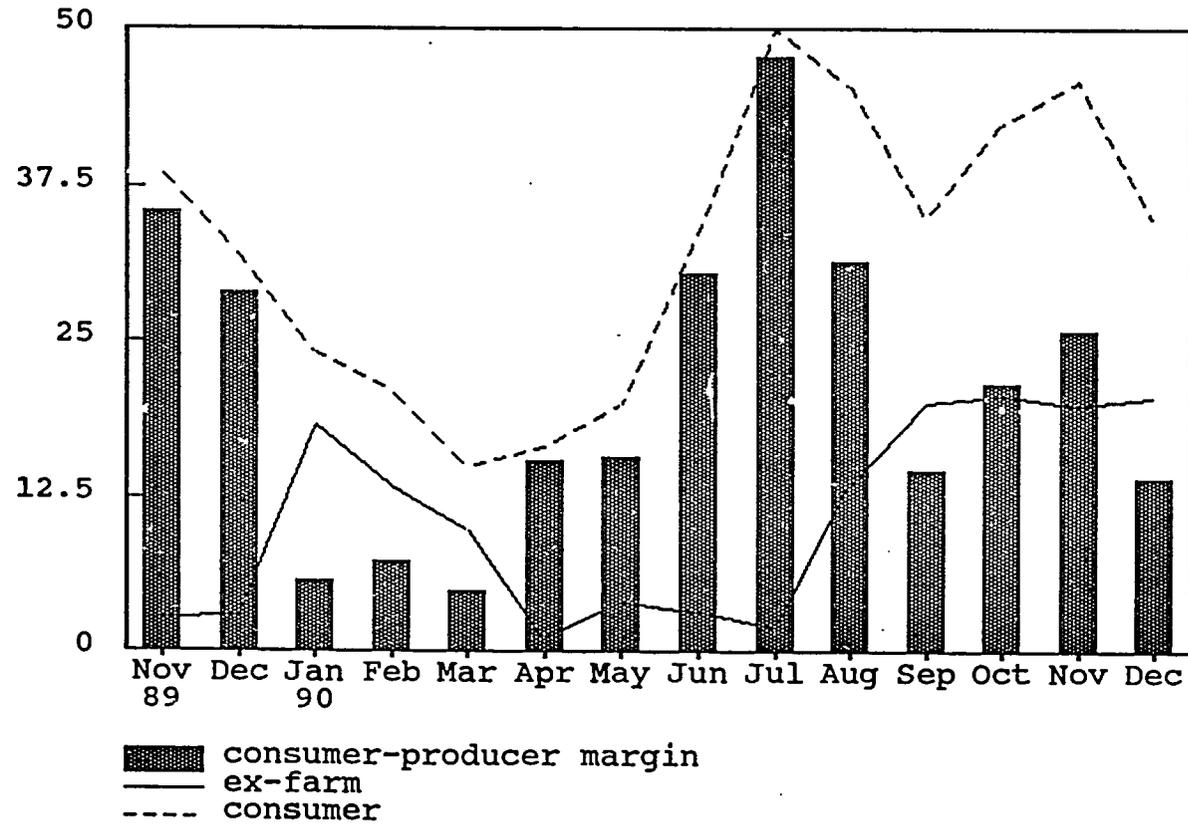
Edible Beans
National Off-the-Farm Sales & ENABAS...

k cwt



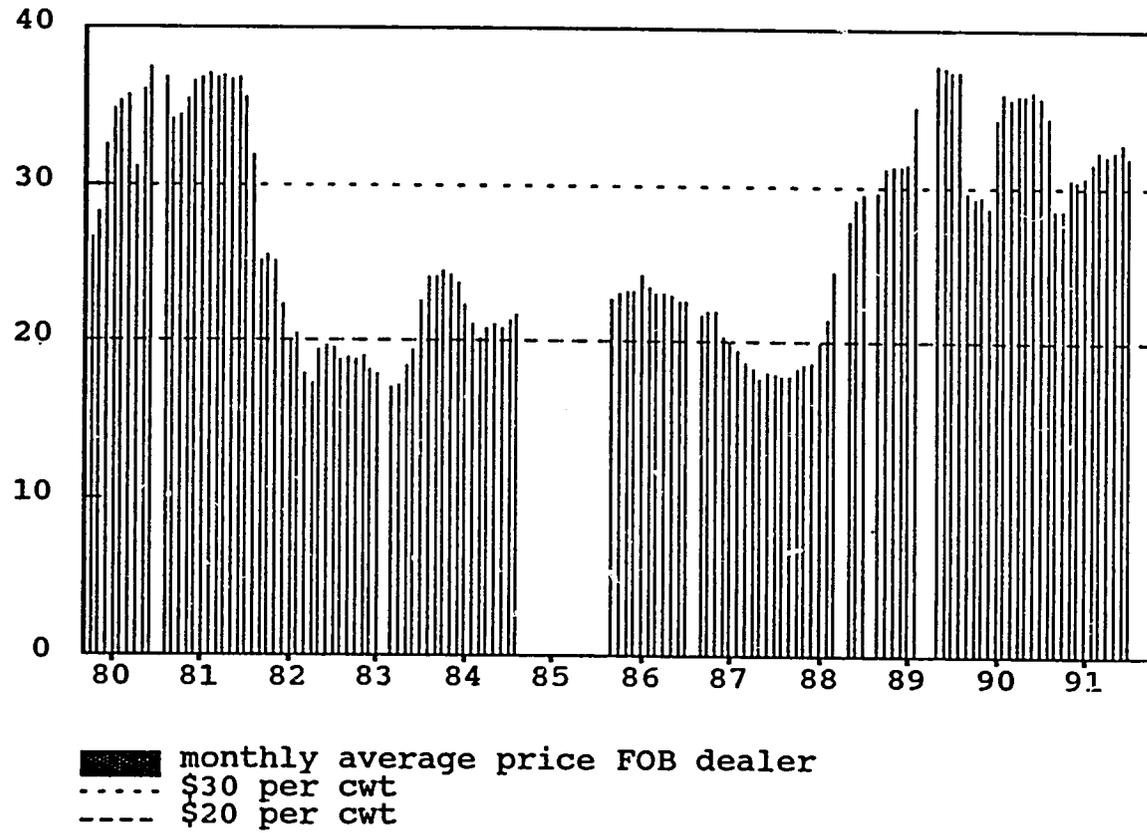
Edible Beans Prices

BM\$ per cwt



Small, Red Beans
Prices

nominal dollars per cwt



IV. Commodity Systems

D. Edible Beans

Almost all (99%) beans are produced by small and medium farms, with yields that range from 7 to 11 cwt per manzana. Many small farmers plant beans as a second crop, usually following corn. Traditionally corn is the subsistence crop and beans are the "cash" crop.

Given the variety of production methods, the depressed ex-farm price of C\$108.60 is marginal to profitability. All farming techniques would be very profitable at current international price levels, and could generate returns that would indicate a land value of approximately \$1,000 per manzana.

<u>Farming method</u>	<u>Costs per manzana (cordobas)</u>	<u>Revenue per manzana (US \$)</u>	<u>Domestic Resource Cost</u>
Hand labor	78.10	163	1.56
Using oxen	110.55	118	2.12
Using no tiil	80.75	237	1.02

Clearly, beans are extremely competitive with imports (DRC below 5 shows favorable competitiveness at official exchange rate of C\$5 to \$1.) In contrast to corn, beans have more desirable characteristics for small farmers in remote areas:

- Relative high value
- Less perishable
- Can be grown efficiently with hand labor

IV. Commodity Systems

D. Edible Beans

The restriction of exports is the most important constraint to increased production of beans. Farmers lose a potential market and receive depressed prices. A shift to free market prices would probably reduce urban consumption, but any surplus could be exported.

- Plantings in 1991/92 are flat because of low prices and the lack of export markets.
- Exports (mostly to Central America) could reach 30,000 tons by 2000 (\$18-25 million) if the export ban were eliminated. The principal limit to growth is the area with suitable growing conditions.
- Over the medium term, new varieties of bean could be introduced to meet consumer preferences in specific markets, for example black beans for Guatemala.

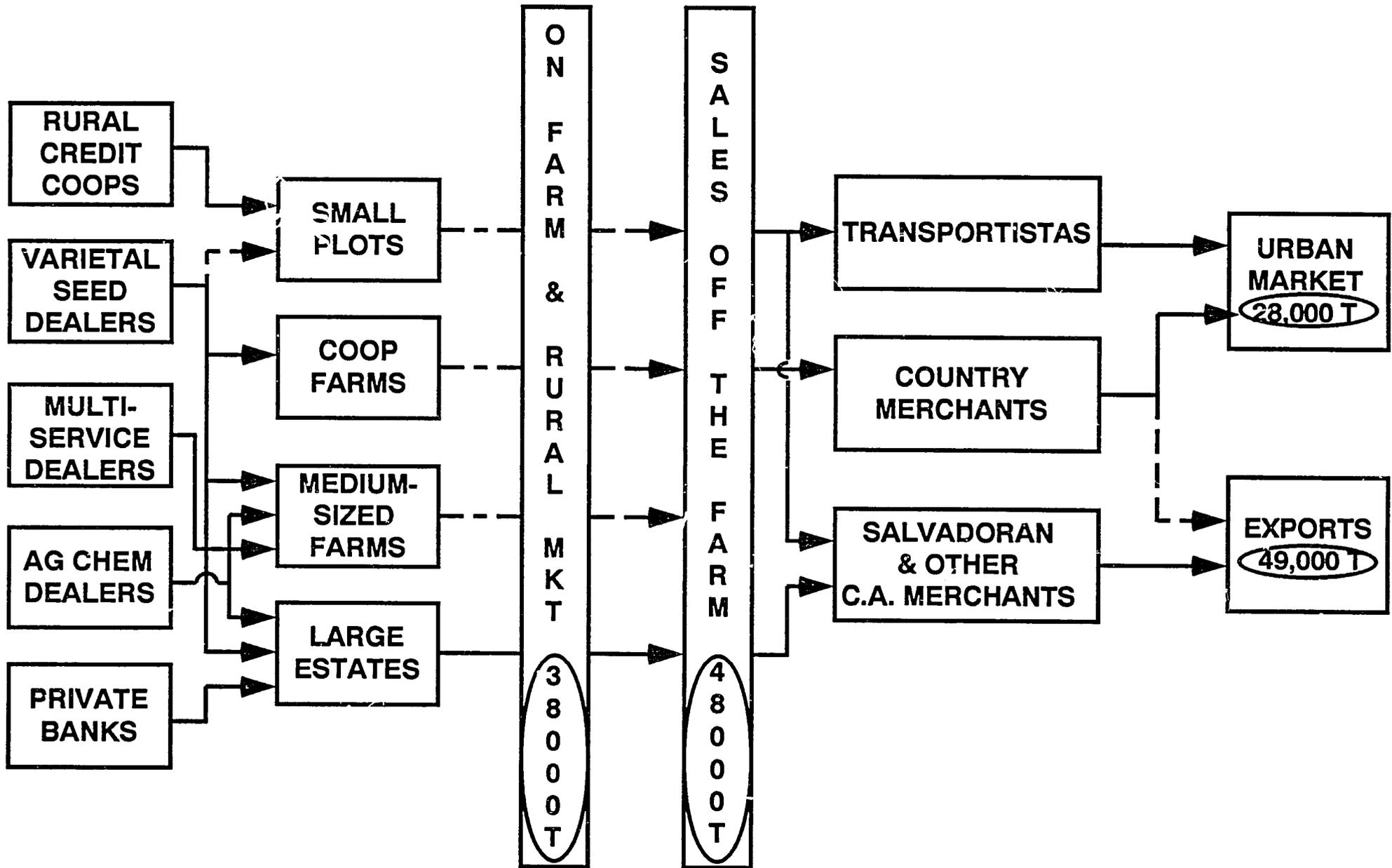
The bulk of trade in edible beans would be carried out by private merchants and cooperatives since little drying is required (in contrast to corn and sorghum). Thus, ENABAS is not crucial to the future promotion of beans.

The key issue over the short term is how to manage the transition to free trade. The government is concerned that immediate liberalization of trade will result in immediate domestic shortages and price increases as stocks are exported.

- One approach would be to permit imports while simultaneously allowing free exports. Given the expected crop in the U.S.A. this year, imported beans could be available, depending on consumer acceptance. The net result would be an increase in domestic food prices but relatively abundant supplies, while offering producers and traders better prices. This would encourage more plantings next season.

The evolution of the bean system is characterized by the following figure.

Bean System 2000



IV. Commodity Systems

E. Rice

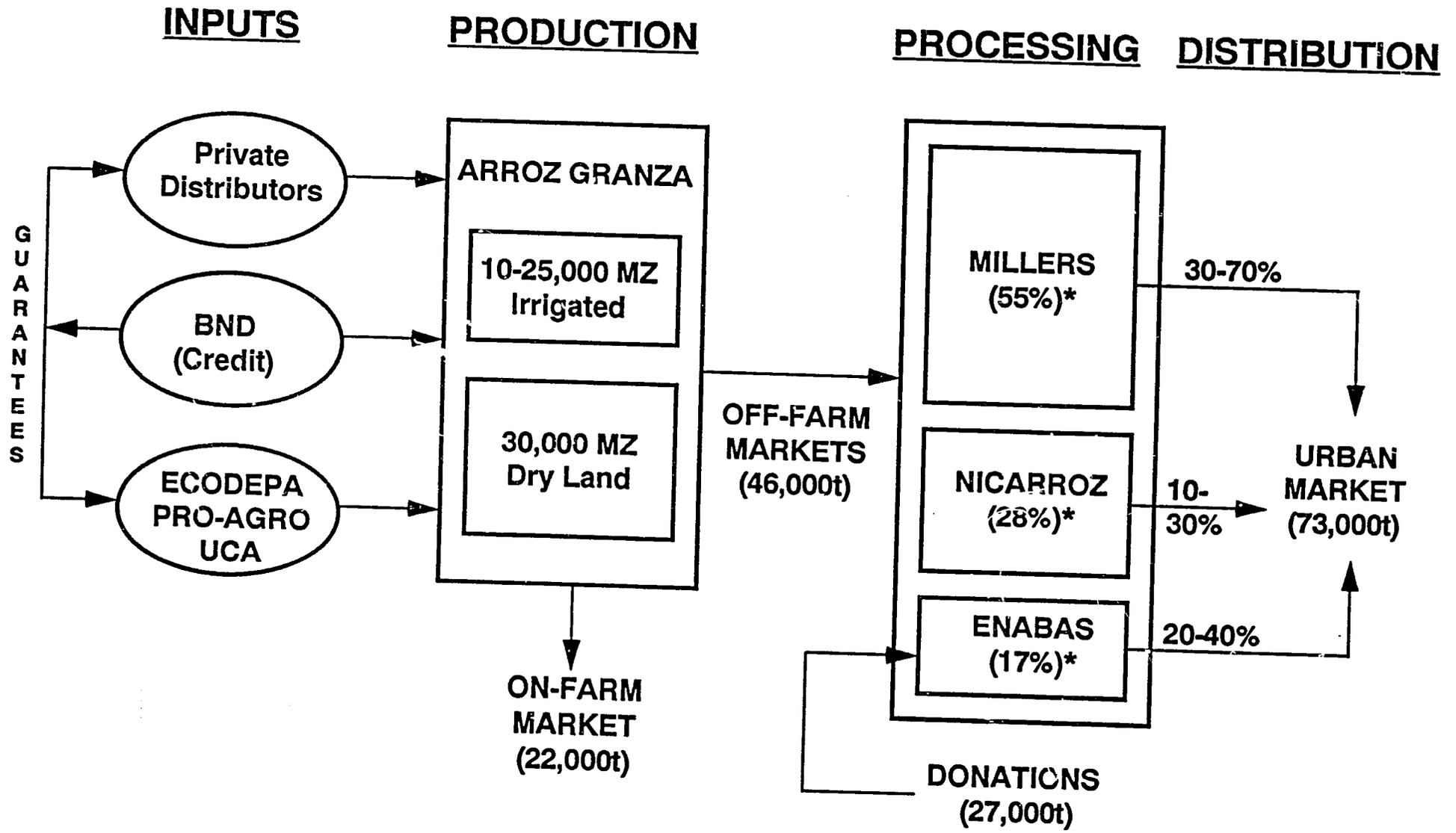
The domestic market is currently about 109,000 tons, but contracted about 1% per year between 1980 and 1990. Rice was introduced in the 1970s, with heavy government promotion. In a market environment, it is projected that per capita consumption will return to levels prevailing in the 1960s. Since rice is a "superior" energy food, it could replace some corn if per capita income rises. In rural areas, the price of rice is almost three times that of corn. Urban per capita consumption fell from a high of 120 grams per day to 87 grams currently, and is projected to fall to the same 62 grams by century's end.

As with other grains, the principal market segments are on-farm consumption and the urban market:

<u>Segment</u>	<u>Current consumption</u>	<u>Per capita consumption</u>	<u>Projected growth (%)</u>
On- farm	22,000 tons	40 grams	-0.6%
Urban	73,000	87 grams	0.7%

Domestic production does not meet demand. Off-farm sales are about 71,000 tons, with the balance of 35,000 provided from imports.

Rice System: Total Market (95,000t)



IV. Commodity Systems

E. Rice

Rice millers buy unmilled rice from producers or intermediaries, remove the husk and bran, then merchandise the white rice to the retail trade (mostly small stores and some tiendas campesinas). Milling is handled by: NICARROZ, a state enterprise handling its own production from its 6 farms; ENABAS (which handles imports as well as some local purchases) and private operations. Capacity is as follows:

<u>Entity</u>	<u>No. of mills</u>	<u>Milling capacity</u> <u>(cwt/day)</u>	<u>Upright storage</u>	<u>Godown storage</u>
NICARROZ	6	285,000	369,000	121,000
ENABAS	4	173,000	253,000	250,000
Private	25	554,000	134,000	371,000

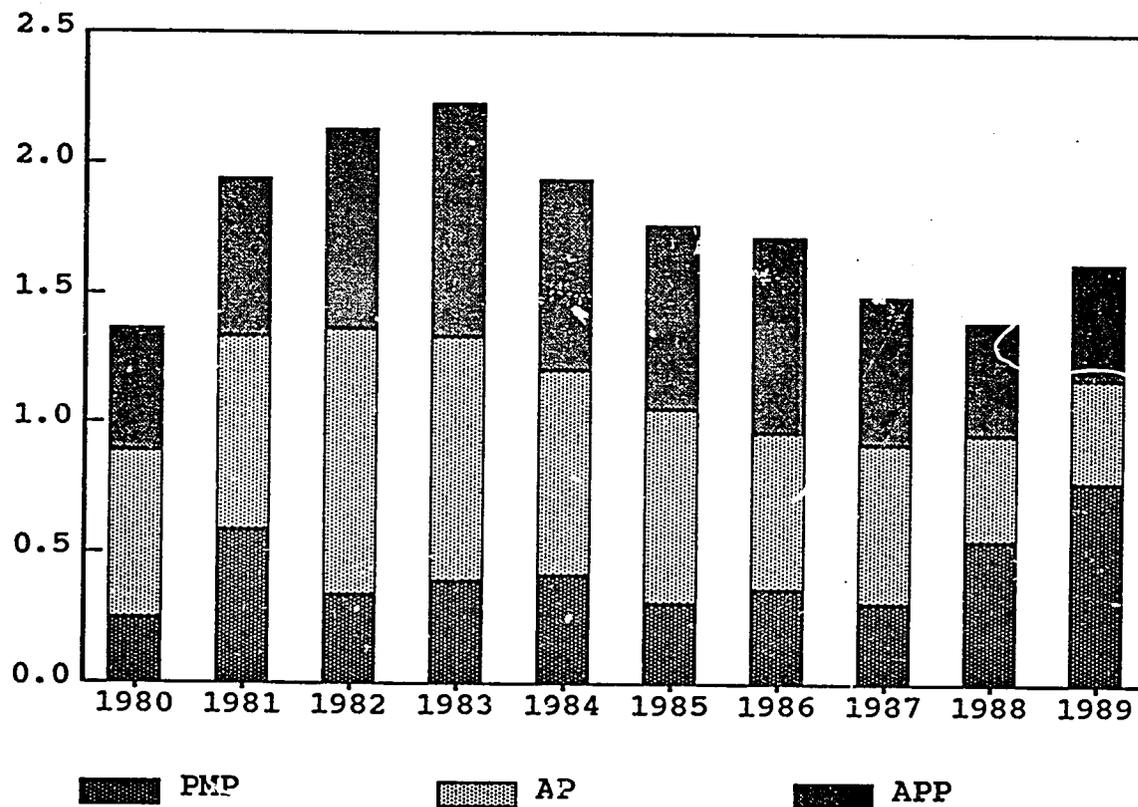
The state-owned entities supply between 30 and 70% of the urban market, with 20-40% for ENABAS and 10-30% for NICARROZ.

- ENABAS's pricing practice appears erratic. Its bid to producers in 1990 declined through the effect of inflation while ex-farm prices stayed level, particularly in the last half of 1990. After holding its wholesale price well below the market, ENABAS brought prices into line after February 1991 (see figure).

Rice
Production by Producer Type

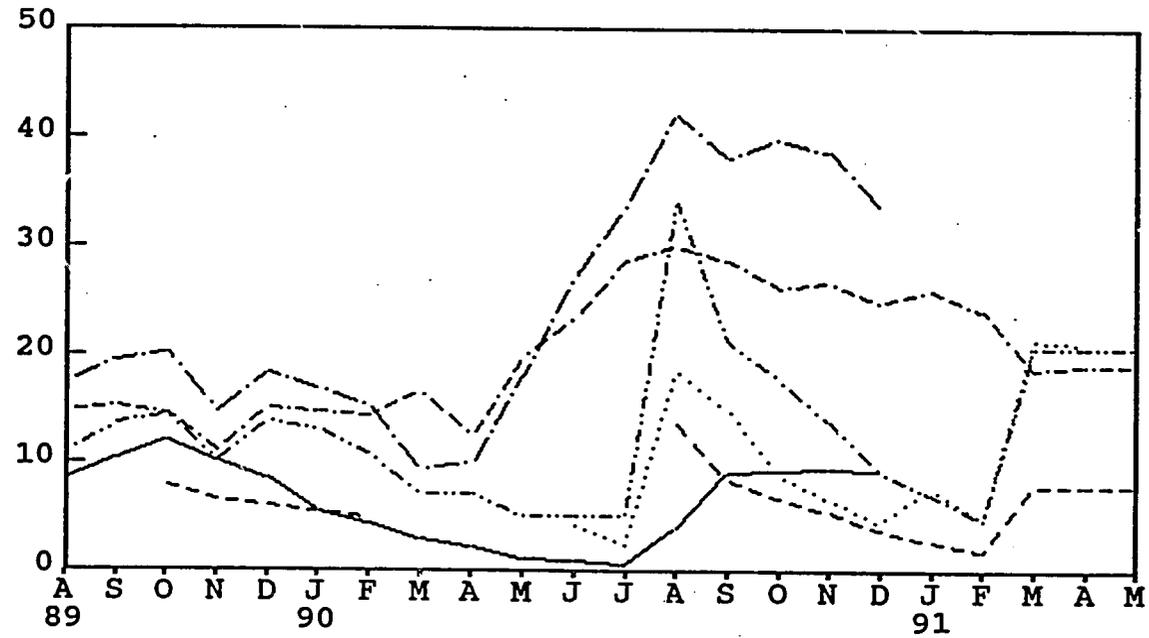
k mz

Thousands



Rice
Prices

BM\$ per cwt



- unmilled ex-farm--market
- unmilled ex-farm--ENABAS
- wholesale--market
- wholesale--ENABAS
- wholesale--NICARROZ
- consumer--market

IV. Commodity Systems

E. Rice

About half the rice output is generated from about 25-30,000 manzanas of non-irrigated land, mostly on small and medium scale farms. The balance is produced on about 100 irrigated farms, six state-owned, that, according to the rice growers association, will be down to 10,000 manzanas in 1991/92 from 25,000 last year. (More recent forecasts are more optimistic.)

- Yields on small and medium farms are just over 22 cwt, while larger private farms average about 28 and state farms about 36.
- Dryland rice using hand labor and oxen is marginally competitive in world markets; however, irrigated rice would have to generate yields of 70 cwt to be competitive at current exchange rates, and 55 cwt at a rate of 8:1 (see figure).

If the question of feeding the urban population is uncoupled from policies regarding large-scale mechanized rice production, some areas now in rice could convert to other higher value crops that can best utilize the irrigation facilities.

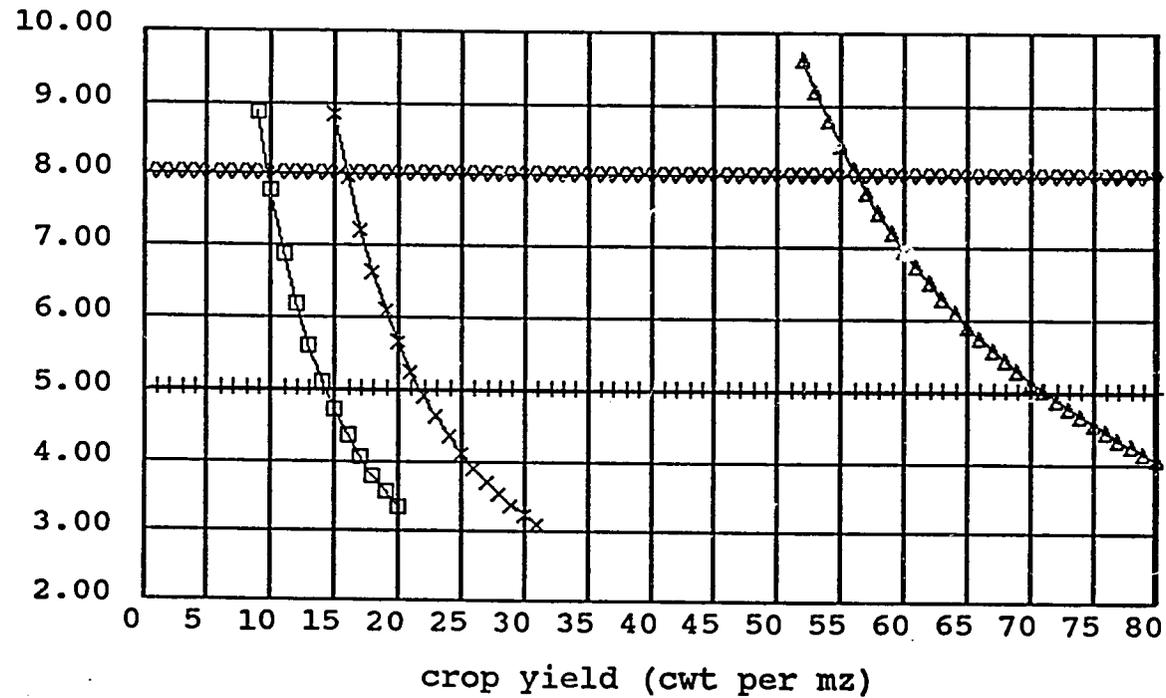
Dryland rice is likely to persist as a cash crop only so long as the domestic price is at a premium over corn, and almost comparable to the price of beans. Open markets likely will shift from rice to beans in a rotation with subsistence corn.

ENABAS should sell off its rice mills and exit the rice trade. NICARROZ should sell each of its farming operations as is, leaving to buyers the decision whether to grow rice in competition with international small farmers and supplies.

The expected future structure of the rice system is presented in the following figure.

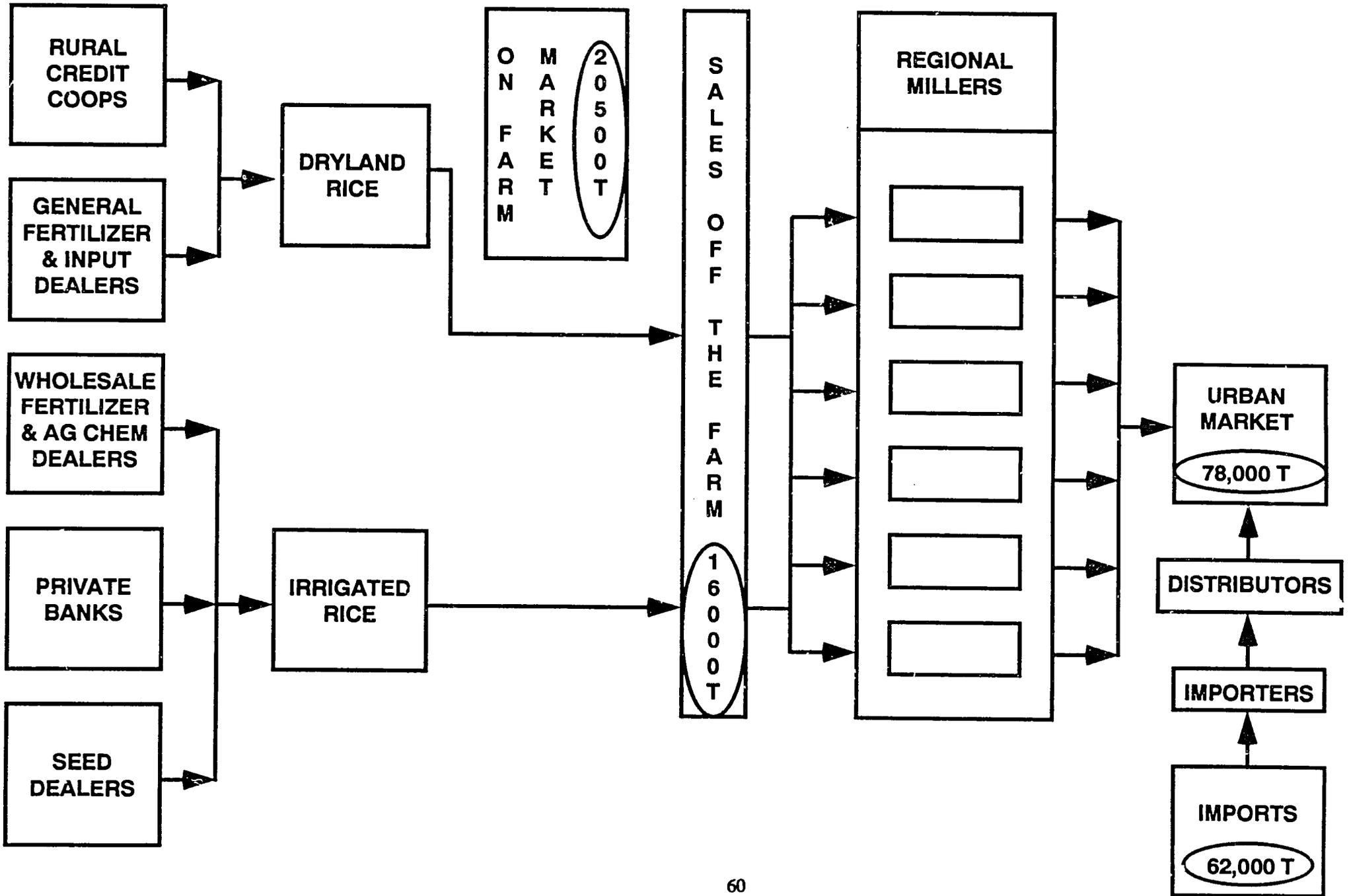
Domestic Resource Cost as a Function of Yield
Rice Using Alternative Technologies

Cordobas per \$



- DRC (hand labor)
- × DRC (oxen)
- △ DRC (irrigated)
- + official exchange rate
- ◊ equilibrium exchange rate

Rice System 2000



IV. Commodity Systems

F. Sorghum

Sorghum is used (about 94,000 tons total) for both food (million and white sorghum) and animal feed (industrial). While historically, human and animal consumption have each accounted for about half the output, the feed market has contracted in recent years.

- The feed market for sorghum has declined 60% since 1986 due to the severe contraction of the poultry industry.
- On-farm food consumption increased in recent years as alternative food sources available to subsistence farmers declined.

The outlook is for slightly declining food consumption and expanding demand for feed (in the medium term).

- As income increases, demand for sorghum both for food and feed will grow.
- Some potential exists for modest exports within Central America. Domestic costs are only marginally over world prices (8-10%) but yields can be increased significantly.

Prices are similar to those for corn (about C\$40/qq). Since yields are also similar, while costs are lower, sorghum tends to be more profitable than corn for mechanized producers with average or below average costs.

- Costs are 25% lower for mechanized farmers and 20% for semi-mechanized (relative to corn).
- Most producers are able to cover costs, with efficient producers slightly profitable.
- As with many other crops, returns are better on lower technology farms.

The demand for sorghum is derivative on the demand for poultry. The outlook is also dependent on the ability to improve yields/cut costs.

IV. Commodity Systems

F. Sorghum

The production of sorghum is dominated by private producers who farm 73% of the 45,000 ha. in sorghum.

- There are about 355 large scale producers and 2,335 small scale private farmers
- State enterprises account for 9% of the land in sorghum and co-Ops 18%.

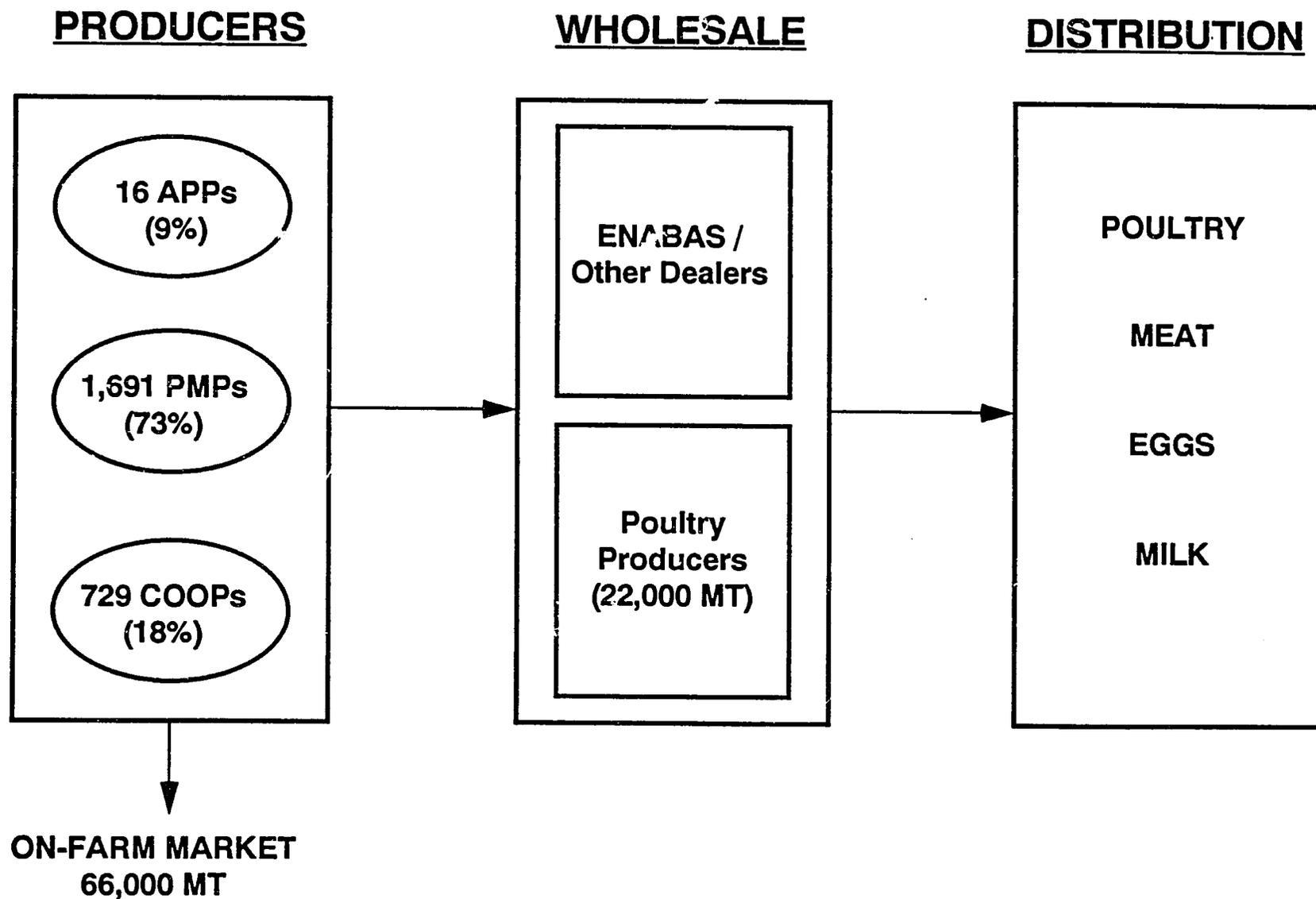
Yields are highest for industrial sorghum, but have been declining slightly for all types.

Industrial	31 qq/mz
Million	15 qq/mz
White	21 qq/mz

Off-farm purchasing and distribution is handled by ENABAS, private feed mills/poultry operators and other dealers.

- Storage and mixing capacity is adequate, especially given the contraction of volume.

Sorghum System



IV. Commodity Systems
G. Poultry

Approximately 69.1 million pounds of meat were consumed in 1990:

Poultry	36%
Beef	35%
Pork	29%

The poultry market grew quickly between 1980-1987, stimulated by strong government encouragement. Annual growth rates:

Chicken	5.1%
Eggs	4.4%

However, 1989 production of 11.9 million pounds was less than half the 1987 level.

- Lower income reduced demand while direct and indirect subsidies were cut.
- 1990 saw renewed growth once grain prices and producer margins stabilized.

IV. Commodity Systems

G. Poultry

Production is currently dominated by two private firms that control about 84% of the market. State production was stopped in 1988, while most of the 1,600 small scale producers have gone out of business.

- The small producers emerged in response to the subsidies of the early-mid 1980's. However, low efficiency (30% more concentrate feed per bird than the large firms), together with the cost-price squeeze of recent years has reduced the number of small scale growers to about 40.
- These small scale producers are effectively subcontractors of the large firms.

The key to the poultry business is the feed/meat conversion rate and the price of grain and protein supplements.

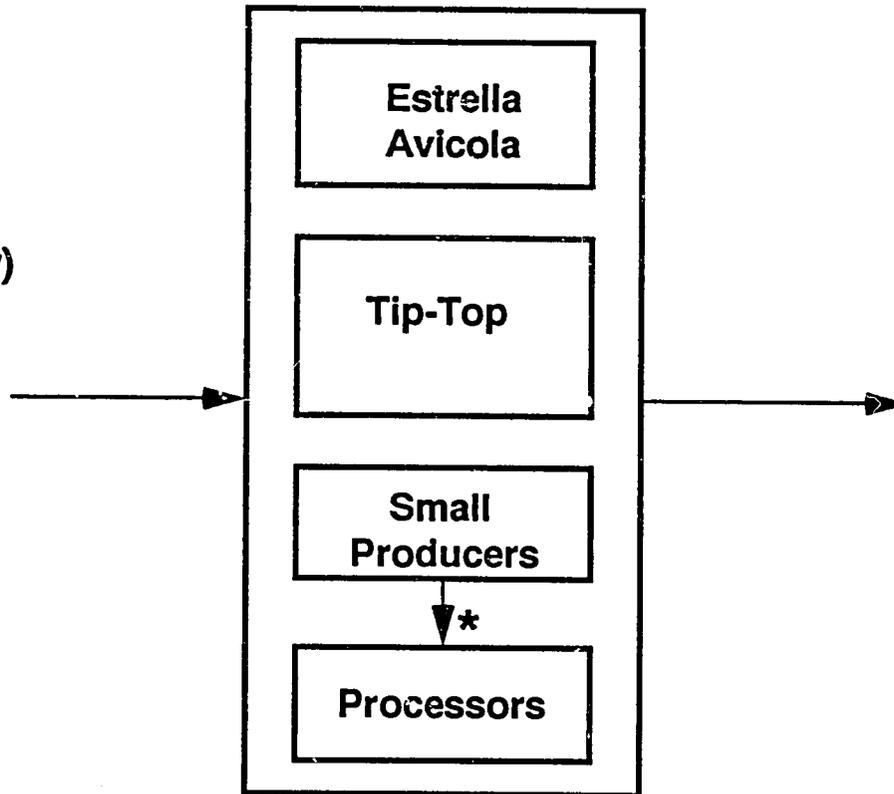
- The conversion rate is about 8.5 lbs. of compound feed per bird (3 per pound of meat).
- About 62% of the feed is sorghum, with imported soy and fish meal providing the balance. This must be imported and is a critical factor in the cost structure.
- The lack of domestically produced protein supplements (especially with reduced production of cottonseed) could be a problem for the industry, especially if the currency is devalued.

Poultry System

INPUTS

- Day old chicks/
fertilized eggs
- Compound feeds
(8.5 lbs/bird
- 3 lbs/lb poultry)
- Sanitary / vet
products
- Facilities
- Administration
- Labor
- Capital

FEEDER/PROCESSOR/SLAUGHTER



DISTRIBUTION

URBAN MARKET
25 million lbs poultry
26 million eggs

* About 40 small poultry producers sell to large processors.

IV. Commodity Systems

H. Coffee

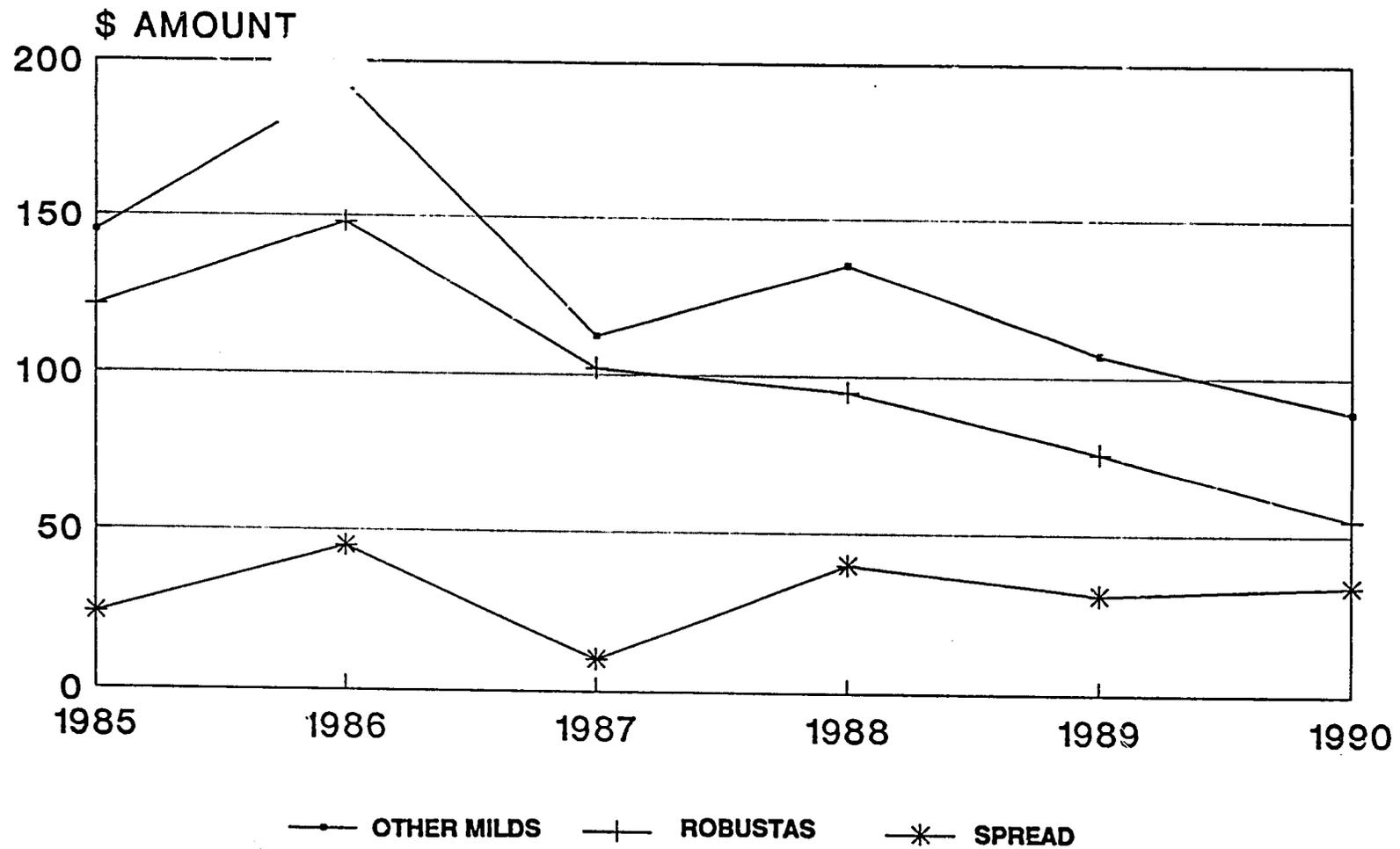
With the collapse of the International Coffee Agreement in 1989, a new era of liberalized trade implies both opportunities and risks for Nicaragua. On the positive side, the market increasingly seeks washed arabicas, or other milds, of the type produced in Nicaragua. The risk is that the chronic over-supply of coffee in recent years suggests an industry shake out in which low cost/high quality producers will emerge in an excellent position for the longer term.

- The quota system locked in market shares for each country, regardless of quality or cost. This primarily protected Brazil and exporters of less desired robustas. Thus, liberalization represents a major opportunity for producers of milds to increase their market shares. Since coffee is the world's third largest traded commodity, gaining a small increase in share represents a major opportunity in terms of value.
- The strong preference for milds is reflected in an increased price spread between robustas and milds which reached 62% in 1990. This will further help producers of milds during an industry shakeout (see figure).
- However, prices for milds have declined from \$135 per quintal in 1988, to \$89 in 1990.

Although worldwide demand for coffee has expanded slowly over recent years, the European and particularly the German markets have expanded more rapidly. This is also a positive development given the strong preference for milds and Nicaragua's current orientation towards this market.

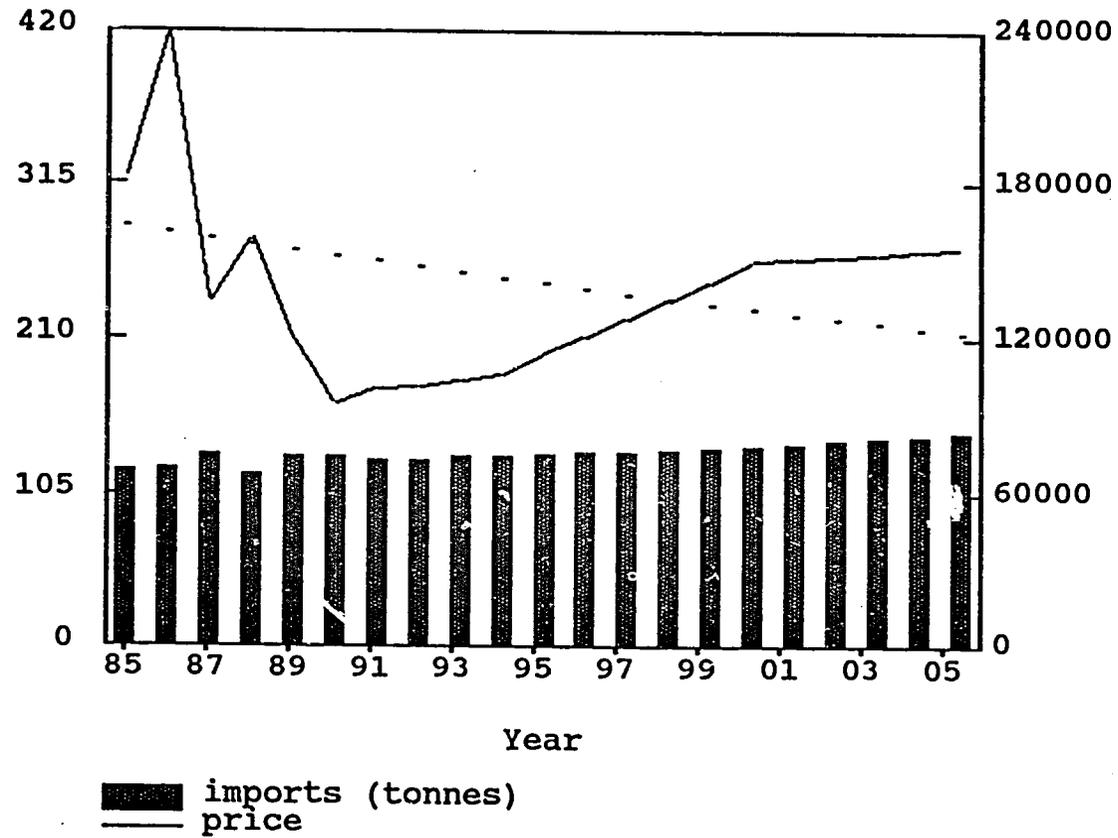
The overall implication is that markets should not be a constraint for Nicaragua, provided it can be competitive at current, or even somewhat lower prices over the short term. As indicated in the figure, the World Bank expects that a shakeout will lead to a price recovery over the medium term.

PRICES FOR OTHER MILDS, ROBUSTAS & SPREAD

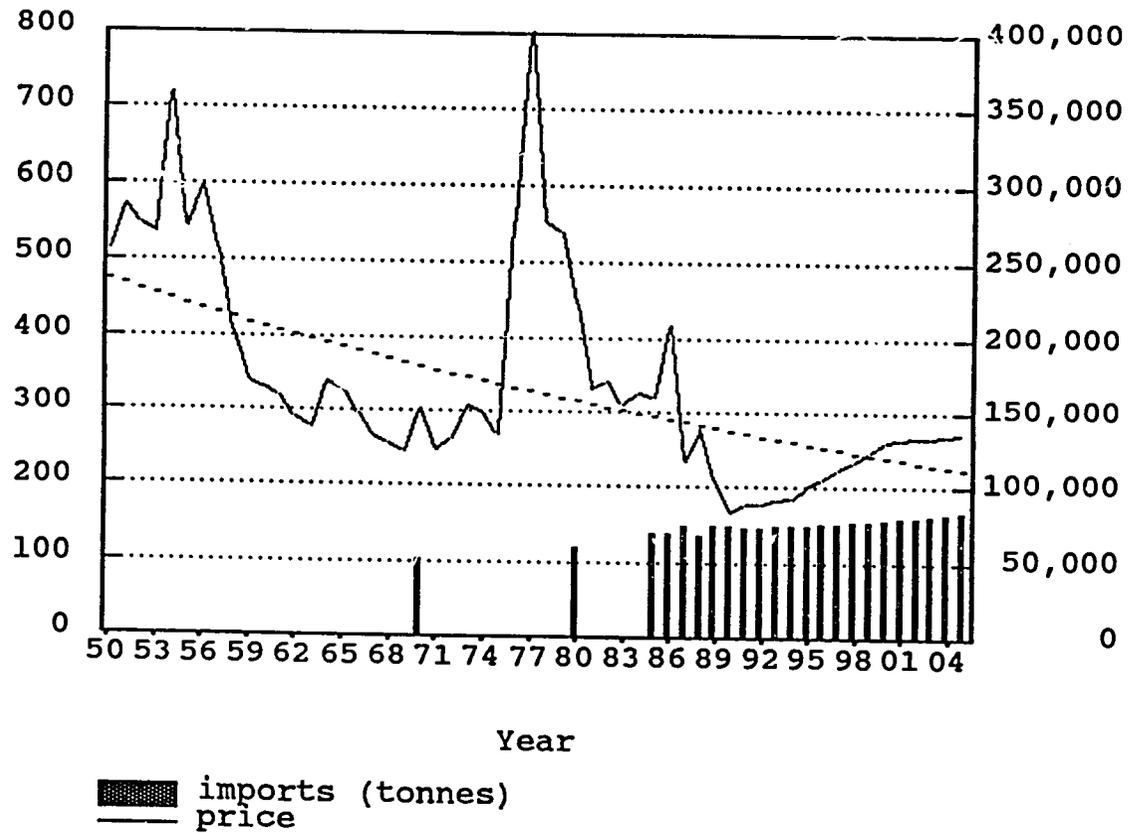


World Coffee Market--Volume & Price
Actual & World Bank Projections

1985 cents per kg



World Coffee Market--Volume & Price
 Actual & World Bank Projections
 1985 cents per kg



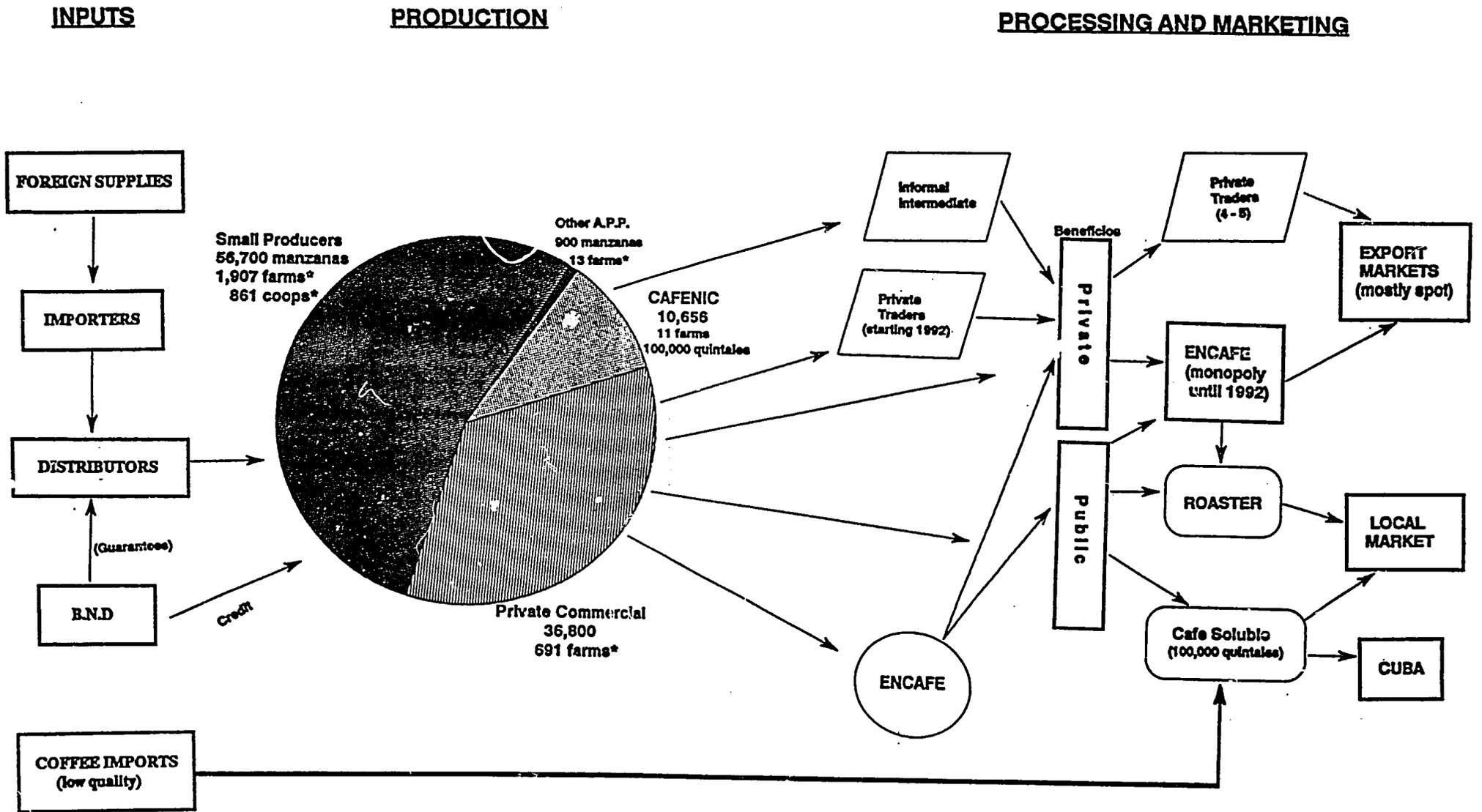
IV. Commodity Systems

H. Coffee

The coffee system in Nicaragua, as depicted in the Figure, is characterized by:

- **Small scale production on slightly more than half the land under cultivation with this crop**, a situation which already existed before the revolution. The major change has been the organization of small producers into co-Ops, mostly CSS, apparently as a means to obtain credit.
- **State owned farms (CAFENIC) on what used to be the best commercial estates**, and which have been returned to former owners or distributed to workers and demobilized military personnel.
- **A state owned marketing monopoly (ENCAFE) which buys and markets all coffee**. A few private traders are being licensed beginning in the next season. While growers have resented the perceived abuses of the monopoly, there is general recognition that ENCAFE has been successful in enforcing quality standards.
- **Adequate, but old washing and drying capacity** owned partly by the state and partly by the private sector.
- **The growing role of CONCAFE** which aspires to provide a range of services, including market intelligence, quality control and research and development.

COFFEE SYSTEMS



* Number of operations receiving credit

IV. Commodity Systems

H. Coffee

The major challenge facing the coffee sector in Nicaragua is how to improve dismally low yields which are the lowest in Central America. Yields in 1990/91 were down to 14 quintales on the prime CAFENIC estates (where they had been up to 50), and 3-5 quintales on small scale units.

The most important problem on commercial plantations appears to be low labor productivity and inadequate management attention. Acrimonious labor-management relations appear partly ideological and partly due to exceptionally low wages (\$1 per day). Not only have workers been difficult to find at these wages, but many devote much of the day to subsistence plots.

- Improving yields requires very careful and labor intensive agronomic practices.
- Based on cost figures from CONCAFE, it appears that increasing the wage bill (tied to productivity increases) would increase revenues more than costs, if better management practices are used.

On smaller scale units using rudimentary technology, the principal problem may be that the return on sales (based on CONCAFE figures) is 39% (compared to 12% for technified and 18% for semi-technified). The question is whether the cost of additional inputs, would be justified by increased yields. The lack of mechanisms for providing technical advice on improved practices is another constraint.

Other key problems affecting yields and expansion include:

- Infestation by the coffee borer
- Decapitalization of plantations
- Deterioration of roads and antiquated transportation/processing equipment
- Inadequate labor interest and skills for harvesting.

IV. Commodity Systems

H. Coffee

A conservative scenario for the next ten years, based primarily on modest increases in yields (still low by international standards) would result in a tripling of output. This would occur as follows:

	Manzanas			Yields			Output		
	1991/92	1996/97	2001/02	1991/92	1996/97	2001/02	1991/92	1996/97	2001/02
Ex CAFENIC	11,000	11,000	11,000	14	29	35	154,000	318,500	385,000
Traditional	56,700	56,700	56,700	3	5	7	170,100	283,500	396,900
Other commercial	38,000	38,000	38,000	8.5	16	26	323,000	608,000	983,000
Currently abandoned	0	30,000	30,000	0	3	6	0	90,000	180,000
TOTAL	105,700	135,700	135,700	6.1	9.5	14.4	647,000	1,300,000	1,950,000

This level of output would generate:

	<u>1991/92</u>	<u>1996/97</u>	<u>2001/02</u>
Exports (\$ MM)	58.5	130	234
Price/Quintal (\$)	90	100	120

Revolving two year credit of \$50 million is required to rehabilitate and upgrade coffee yields as indicated above.

IV. Commodity Systems

I. Cotton

Cotton, which used to be Nicaragua's major foreign exchange earner, is a product of major concern since exports have declined precipitously in the last decade. World prices have been relatively strong, but are declining rapidly.

	<u>1979</u>	<u>1990</u>
Output (Million quintales)	2.47	0.52
Value of exports (Million \$)	135.7	36.6

The domestic market is about 2,000 tons of processed cotton (8%), but declining due to the closure of the principal textile mill. In addition, cottonseed oil and meal are sold domestically.

At current prices and 1990 yields, average returns would be 25% below costs.

- Each quintal yields about C\$473 from seed and C\$4725 from lint, or C\$5,197 per manzana.

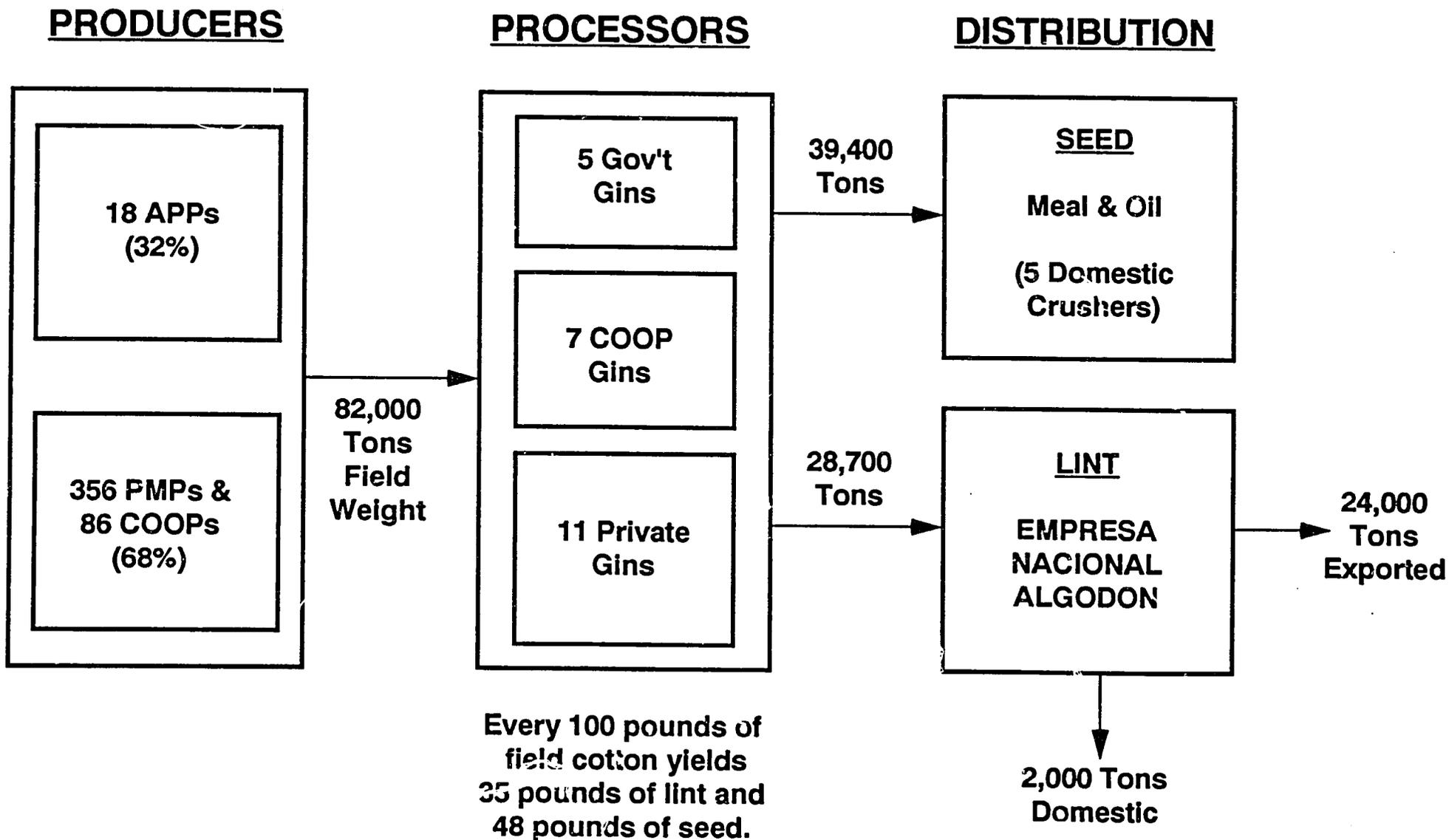
The key problem has been declining yields due to the difficulty in controlling pests, increased costs of chemicals, and damage to soil quality. The outlook for cotton is bleak unless new technologies/varieties can be identified that address these problems in an economic fashion.

- It is expected that the land planted will remain at 35-40,000 manzanas, at least in the near future.
- Expansion over the longer term will depend on whether costs can be significantly reduced (primarily through lower pesticide use) and yields improved (partly depending on the extent to which the soil has been damaged).
- Transferring appropriate technologies that require skilled management and high discipline to small scale producers and/or attracting larger scale investors (until the economics of new practices are well established) are likely to be key constraints to increased output.
- Growers are not sure what crops to shift to. Marginal lands are being used for grazing and trees, and dryland rice. One problem is the lack of an institution looking at the situation from a regional, rather than crop-specific perspective.

A key issue for investigation is whether other oil/protein or export crops can be substituted.

- So far, peanuts appear most promising; soybeans much less so. Other possibilities are untested.

Cotton System



IV. Commodity Systems

I. Cotton

The cotton system structure shows heavy state involvement:

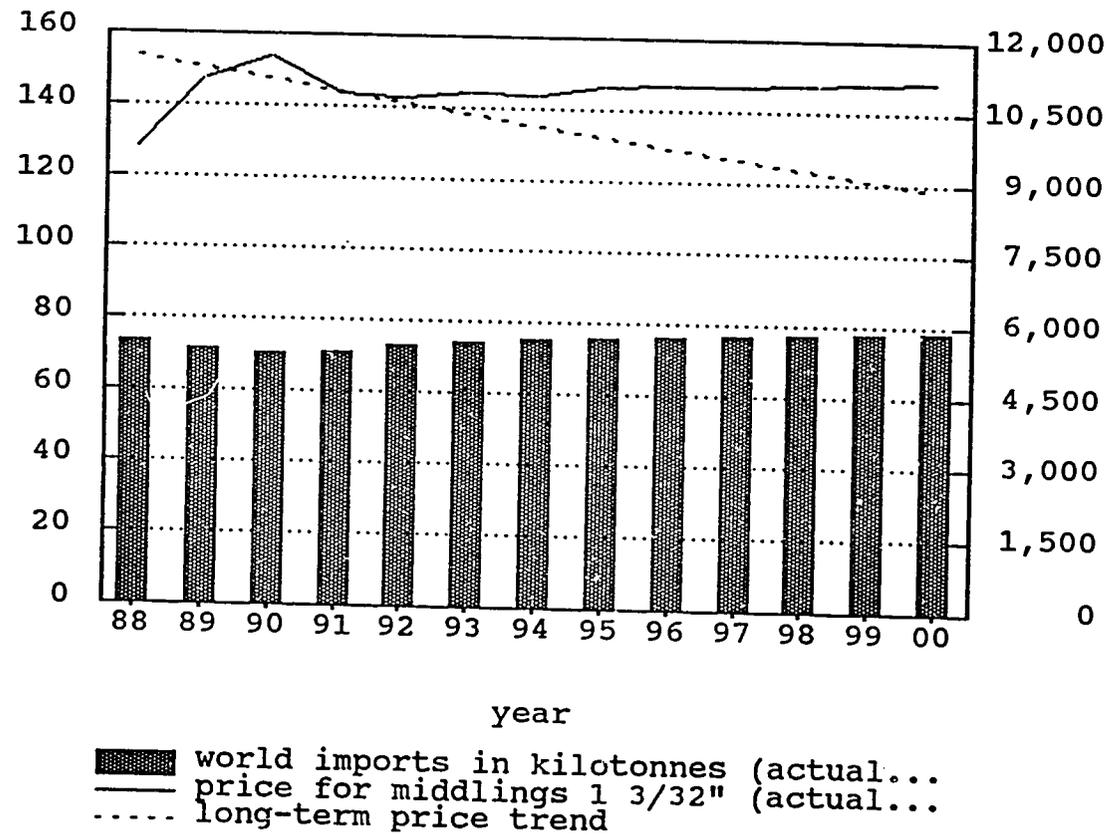
- About 32% of cotton acreage is on 18 state farms with the balance on 356 private farms. The trend has been towards smaller private farms (some very small scale).
- Of 23 gins, 5 are state owned and 7 operated by coops.
- State owned ENAL has had a purchasing monopoly, although private traders are to be licensed this year.

Given the heavy dependence on imported inputs, this product has been key for the private distributors of chemicals and equipment.

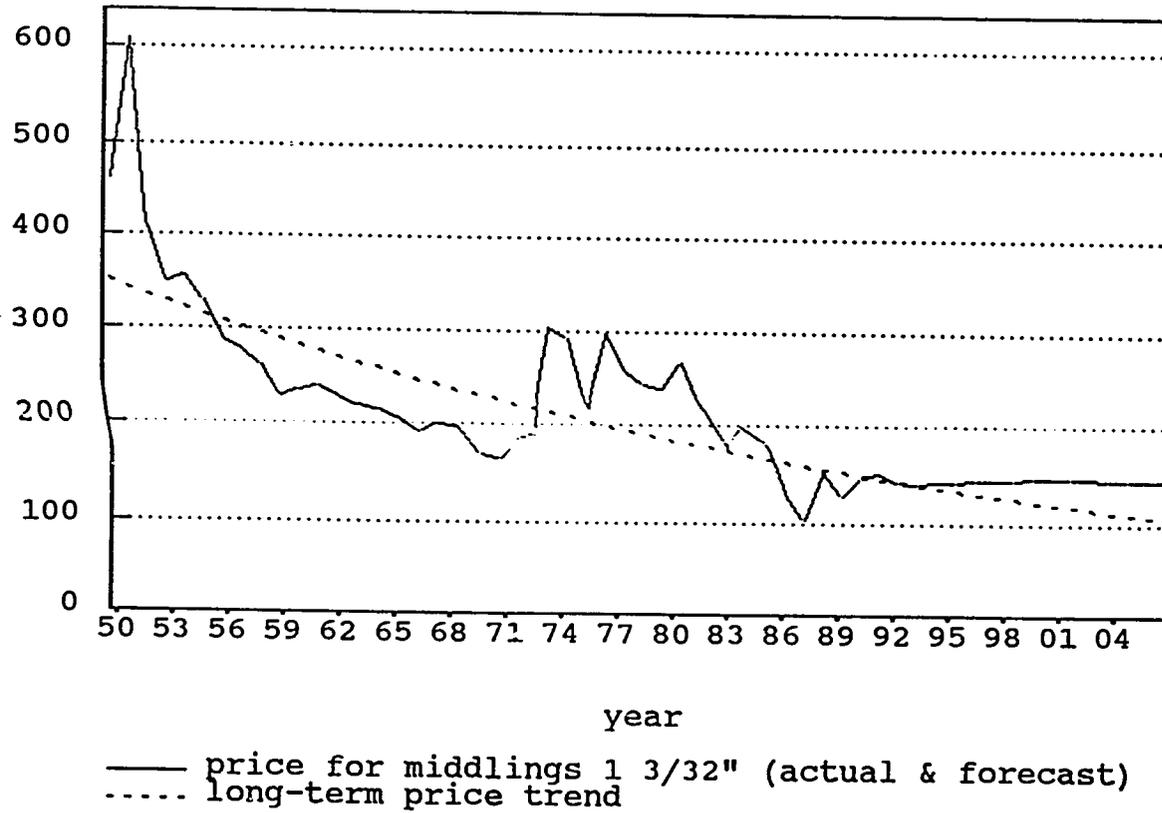
The cotton outlook is dominated by rising production costs and likely weak world prices.

- World cotton production has been increasing more rapidly in exporting countries than consumption is growing in importing countries.
 - Production growth, Exports 1980-90: 3.2%
 - Consumption growth, Imports 1980-90: 1.4%
- Current prices are reflecting saturated markets (down \$0.63 per pound between July and late August), while the long term price trend is downward (see figure).
- Adequate supplies, increasing competition for world markets and price well below 1991 levels are likely for the foreseeable future.

World Cotton Trade
 Actual Price & World Bank Forecast
 1985 cents per kilo



World Cotton Trade
 Actual Price & World Bank Forecast
 1985 cents per kilo



IV. Commodity Systems

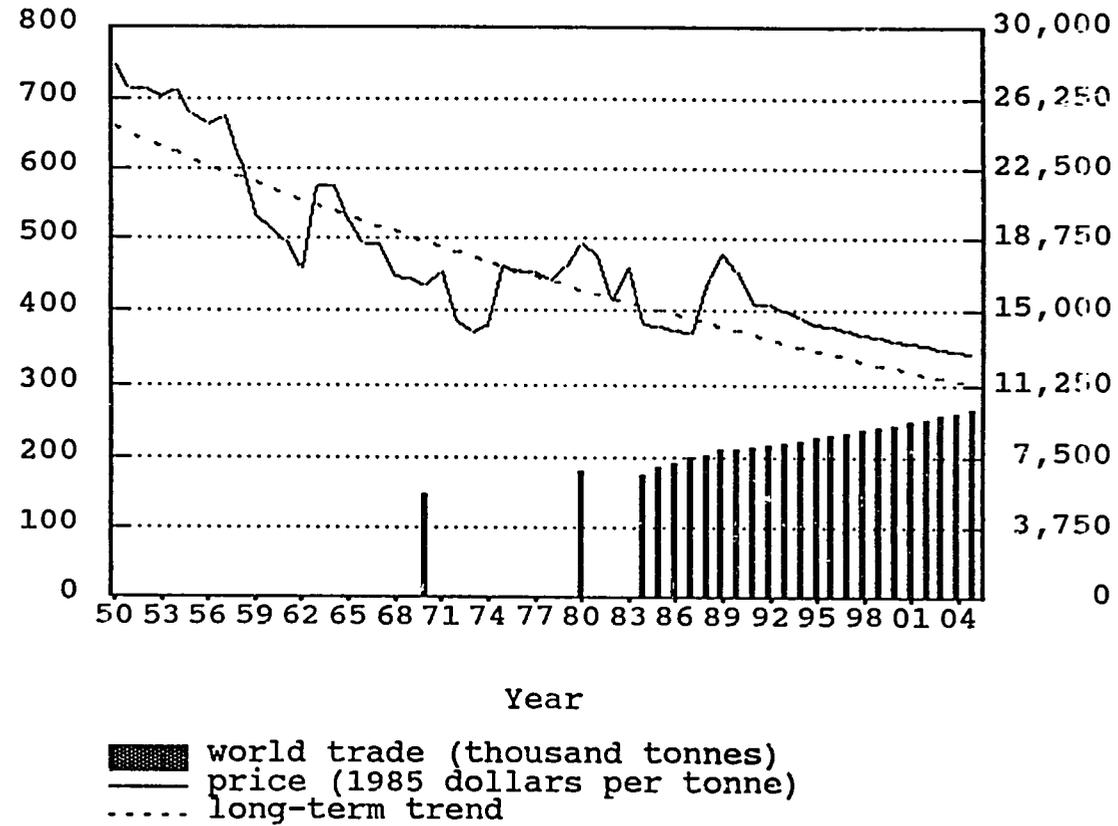
J. Bananas

The world market for bananas has been among the strongest for primary commodities. Imports have been increasing, while prices have remained strong. Europe (with 40% market share), and especially Germany (14%) are key markets along with the U.S. Some key trends include the following:

- While the European market is expected to continue to grow (influenced by the appeal of bananas in Eastern Europe), **the outlook will be heavily influenced by the EC's policy on bananas after 1992.** Key countries such as the U.K., France, Italy and Spain provide protection to domestic, colonial or former possession production. Recent studies suggest that free trade would increase imports from third country sources by 12-26% and world prices by 2-6%.
- The U.S. market offers lower prices and requires higher quality than the European market. German import prices were 33% above U.S. levels in 1990 (\$.75 vs. \$.57 per kilo).
- In response to the positive outlook, major investments are underway or planned throughout Central America and elsewhere, especially in Latin America.

While the market outlook is good (especially relative to other products), the possibility of a rapid supply response implies that competition will increase, on the basis of both cost and quality. As the European market matures, it is likely to become more quality conscious. Thus, the current conventional wisdom in Nicaragua, that the European banana market will absorb anything, would be a major mistake. This is confirmed by the long term decline in the real price of bananas as shown in the figure.

World Banana Market--Volume & Price
 Actual & World Bank Projections
 1985 dollars per tonne



IV. Commodity Systems

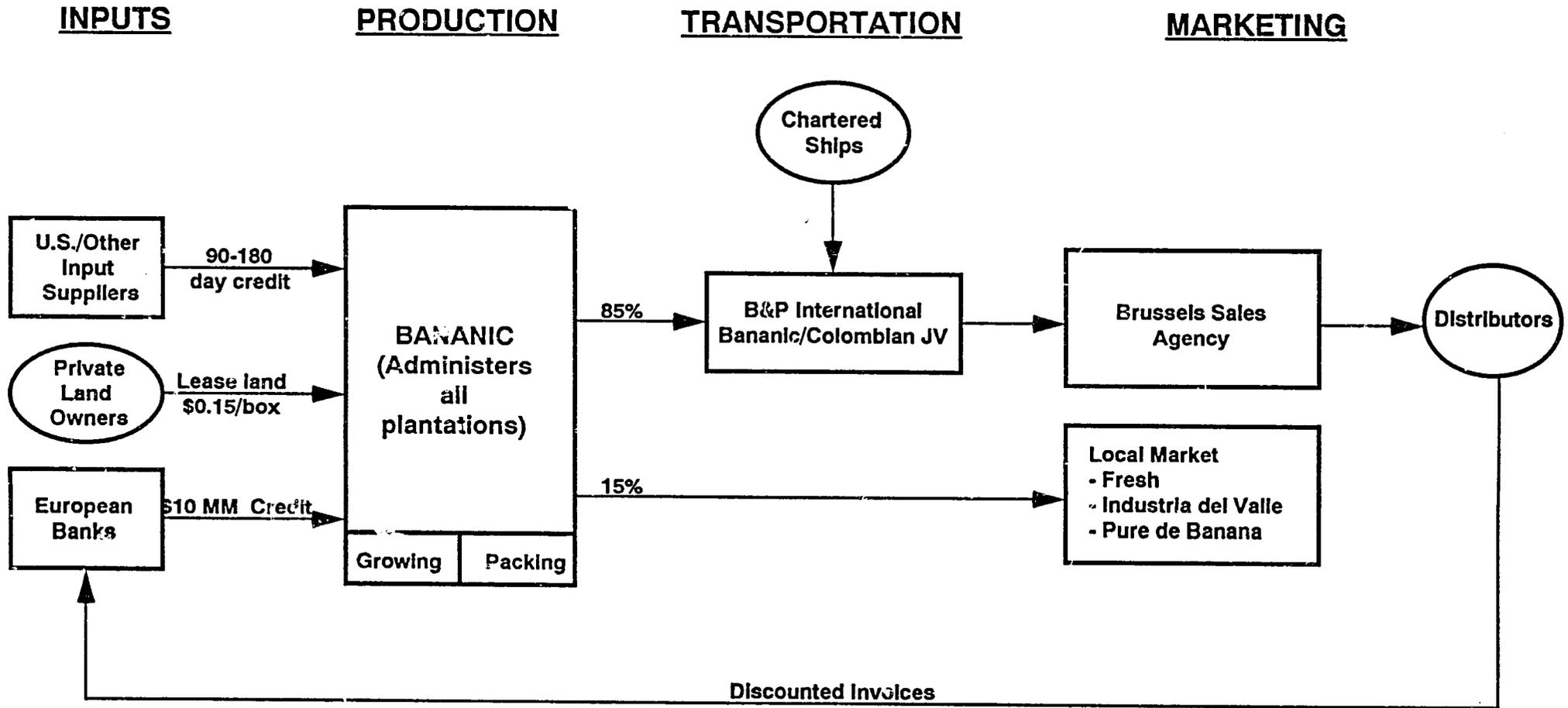
J. Bananas

Nicaragua's output in 1990, estimated at 95,100 metric tons, represents less than 1% of the world market. BANANIC, a state-owned company in the process of privatization, has had a monopoly of production and marketing. BANANIC was reorganized in 1988 and has been relatively successful in restructuring its operations and improving performance.

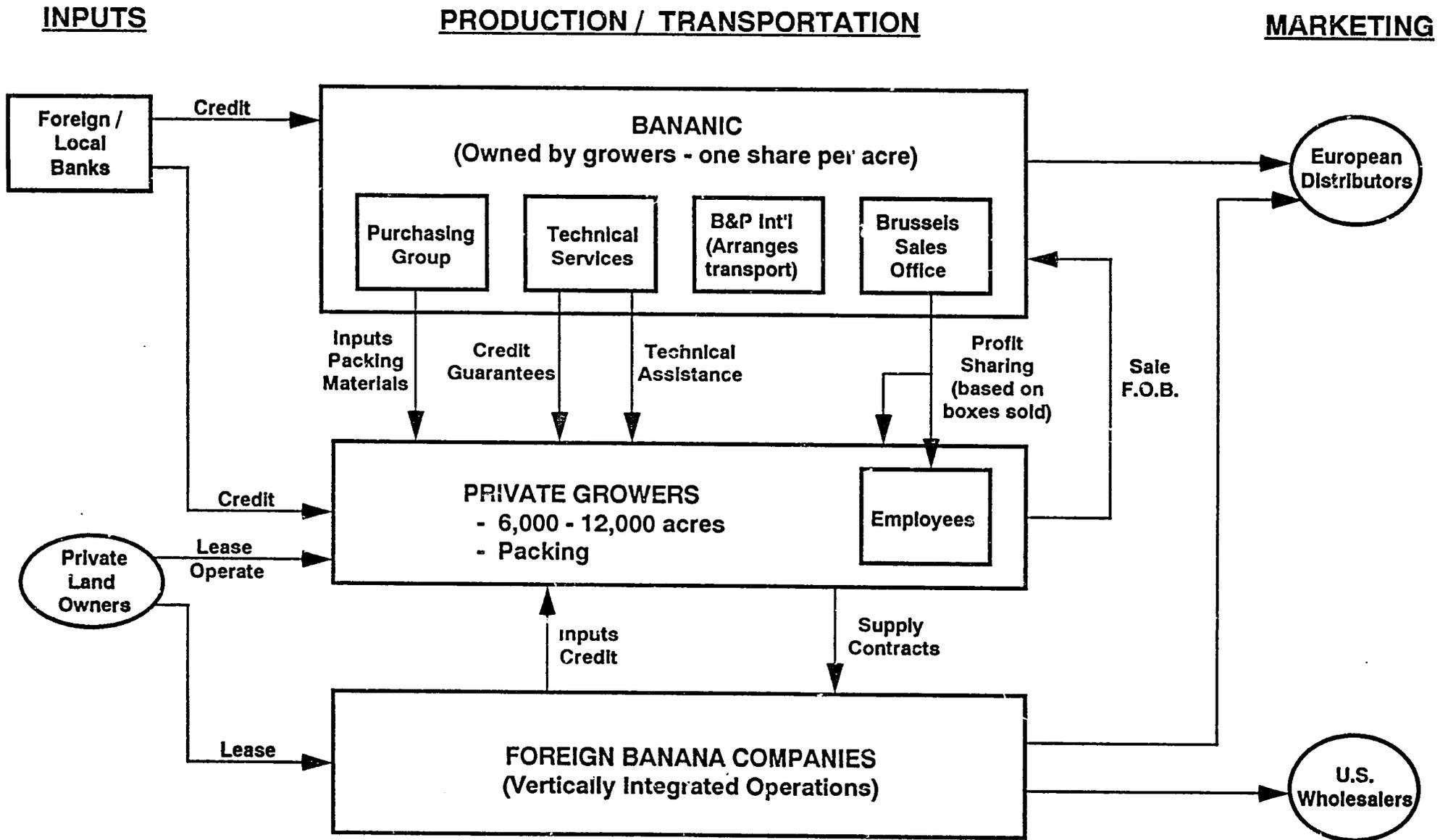
The emerging structure of the system involves:

- The privatization of BANANIC through shares granted to growers according to their acres in production (one share per acre).
- Marketing in Europe through BANANIC and its Brussels sales office, with any dividends divided among growers based on the boxes exported by each (with a yet to be negotiated share for workers).
- Continuation of the current transport/marketing joint venture with the Colombian growers association, as a means of reducing shipping costs.
- Parallel promotion of investment by foreign fruit companies to develop new areas and provide access to different (U.S.) markets.

CURRENT STRUCTURE OF BANANA SYSTEM



LIKELY FUTURE STRUCTURE OF BANANA SYSTEM



IV. Commodity Systems

J. Bananas

The potential for further development of bananas is significant. About 3,000 hectares of land are available in prime growing areas of the Pacific. Other areas are also believed to be suitable but will require more infrastructure. Through expansion, exports could easily be doubled to \$30 million over the next five years (more if yields improve further).

Banana production appears adequately profitable. One feasibility study shows an IRR of 23%, while another grower suggests profits of \$2 per box and costs of \$4 (with a sales price of \$1.00).

The overall conclusion is that this is a sector that should attract private investment, local and foreign, without much support. The principal requirements for rapid growth are:

- **Revocation of the law granting BANANIC exclusive rights in the Pacific region;**
- **Finalization of the privatization process;**
- **Strengthening of the overall investment climate.**

IV. Commodity Systems

K. Melons

The U.S. market for imported melons is primarily from November to April when prices peak. Imports in recent years have expanded rapidly, as summarized in the following:

<u>Year</u>	<u>Cantaloups (1,000 cwt)</u>		<u>Miscellaneous melons (1,000 cwt)</u>	
	<u>All sources</u>	<u>Central America</u>	<u>All Sources</u>	<u>Central America</u>
1987	3,106	469	904	727
1988	3,492	737	767	543
1989	4,629	1,407	1,105	821

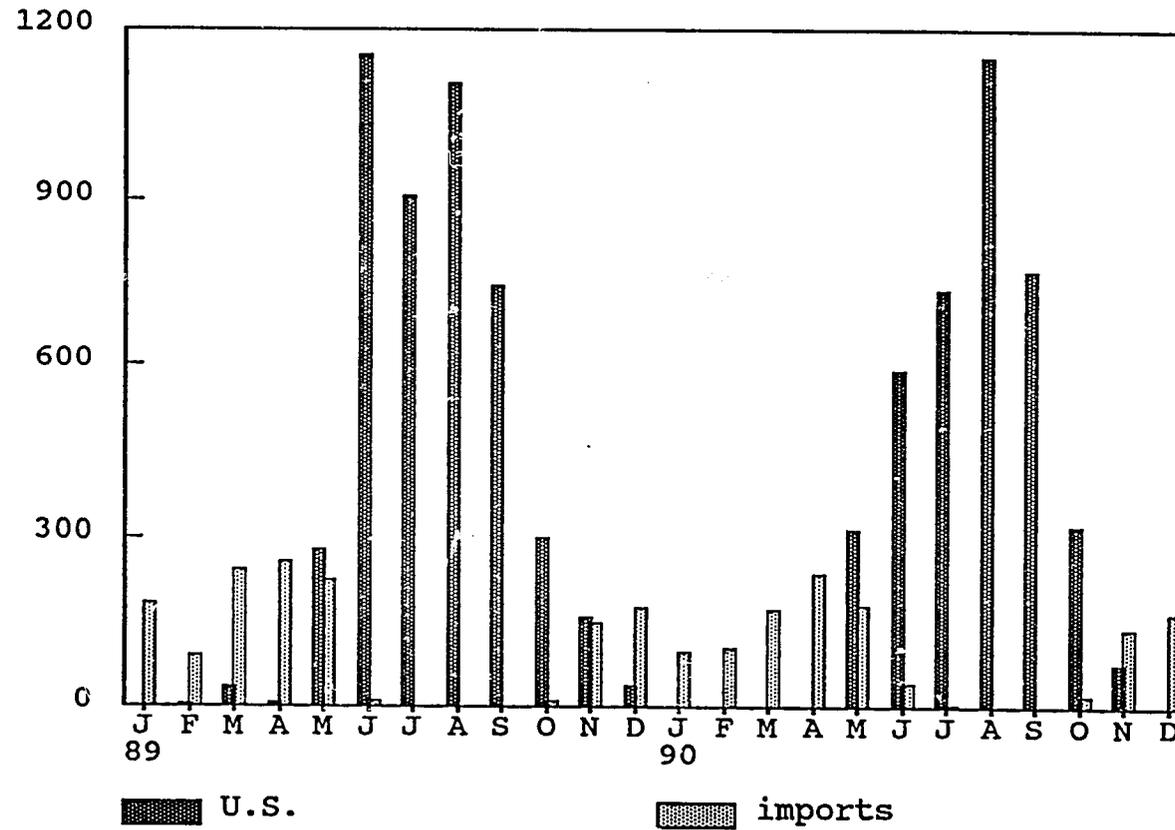
- Mexico, Honduras and Guatemala are the principal sources.
- Prices for honeydews peaked in 1990 at about \$18/carton(Feb.,Chicago), and at \$25/carton for (Dec.)

Although the market is expanding, it is highly treacherous. Not only is it thin, contributing to volatility, but it is shaped by:

- Exporting on consignment, a system that can easily work to the detriment of the exporter.
- High exposure to non-tariff barriers, perishability (especially cantaloups) and quality/phyto-sanitary regulations.

Honeydews Shipments by Origin

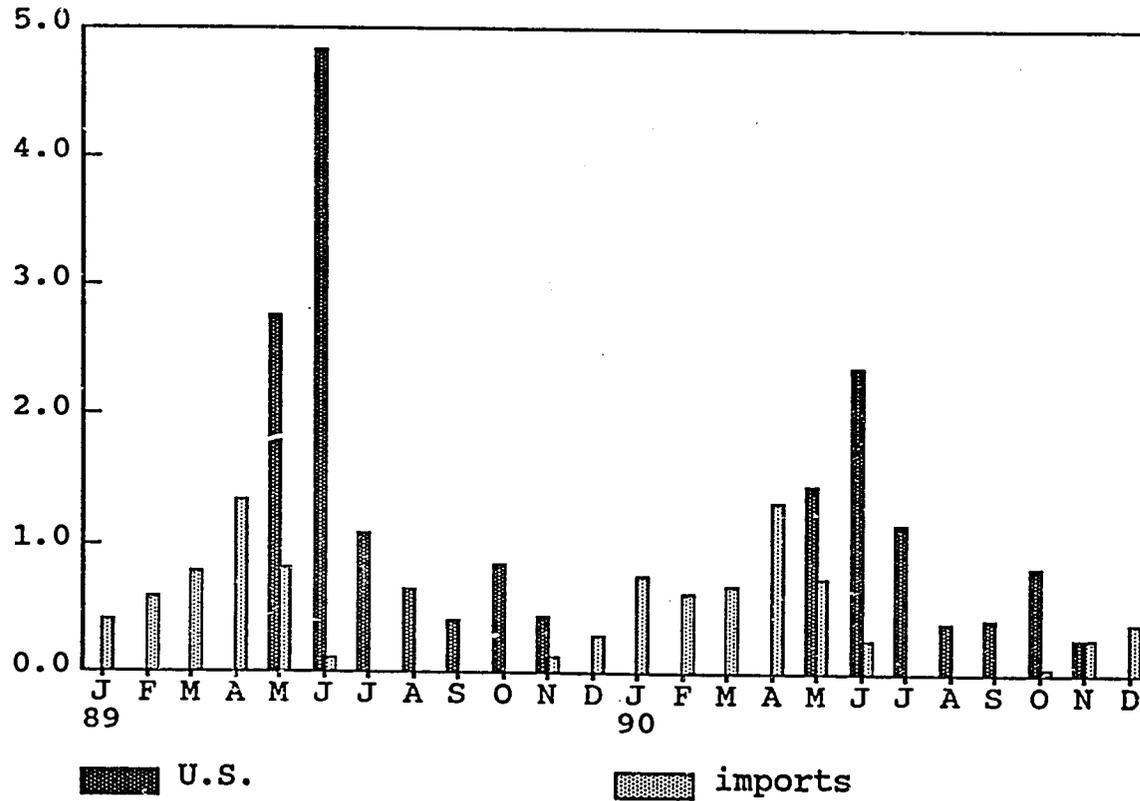
k cwt



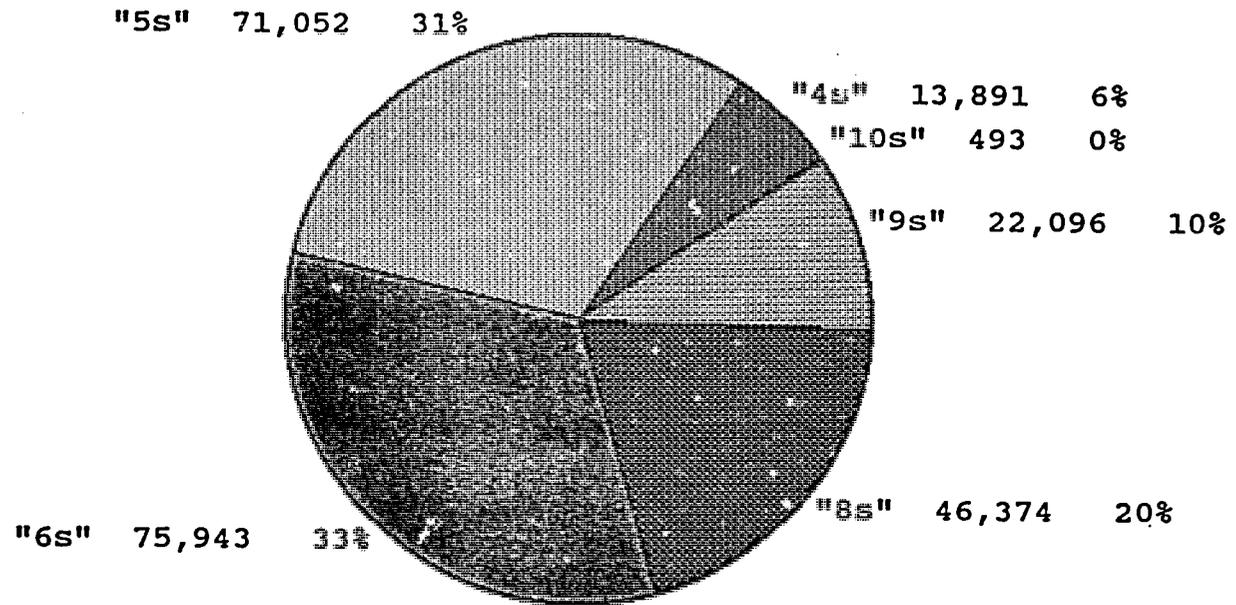
Cantaloupes Shipments by Origin

k cwt

Thousands



Nicaraguan Honeydew Production
(by size)



1990

IV. Commodity Systems

K. Melons

Production in Nicaragua is limited to about 11 producers who planted honeydews for the U.S. market for the first time in 1990. The motivation was to take advantage of installed irrigation systems intended for rice, a crop no longer profitable. With \$1.3 million in financing from the FNI and technical assistance by PROEXAG:

- Just under 600 manzanas were planted
- 230,000 boxes were harvested.
- **Only two producers broke even or made a small profit; \$ 1 million will have to be refinanced.**

Despite the poor results, plans for 1991/92 call for 1,000-1,500 manzanas including 500 in canteloup.

Key issues affecting the melon business in Nicaragua include:

- High shipping costs due to the shipping cartel, and the lack of volume for charters.
- Shipping through Honduras or Costa Rica, such that Nicaragua has a competitive disadvantage of \$.60-.80 per box.
- The lack of cold storage, which is essential for cantaloupe.
- The need to use just the right type of irrigation (the existing overhead systems may not be appropriate) and soil.
- Exposure to strikes by customs officials and phyto-sanitary officials during peak season (as occurred).

Melons are illustrative of the difficulties of developing non-traditional markets. The up-front development costs are high (just in obtaining experience) while the potential gains are very modest over the short-medium term. However, their development is necessary over the medium term to provide viable options to less competitive products. This requires the capability to: identify and test possibilities; develop appropriate varieties; process and pack; and most important, obtain access to markets.

V. Developing a Strategy for the Agribusiness Sector
A. Methodology and Objectives

Strategic planning is a process, not a document. It is only successful to the extent that key decision makers and interest groups participate and come to share a vision of, and commit to, priority objectives, corresponding supporting strategies, and the action plans for their realization. To be successful, a strategic plan must:

- Carefully evaluate markets and competitive position.
- Select and commit to a few top priority objectives and strategies.
- Ensure that the financial, human, and other resources are identified and committed.
- Include assignment of responsibilities, specific targets, and milestones for measuring progress.
- Be sufficiently flexible to allow for periodic review and adjustment.

The following section is offered not as a strategic plan, but rather as a framework to stimulate discussion and help guide the process. Ultimately, the resulting strategy must reflect a Nicaraguan consensus and commitment.

In preparing the following guidelines, it is assumed that Nicaragua is committed to liberalizing its economy. This is understood to mean both an emphasis on professional business management, private investment/ownership of the means of production, as well as competitive and functioning markets.

It is also assumed, in line with the assessment of the macro-economic context in Section II, but subject to further refinement, that the priority objectives should be:

- **Creation of productive jobs (both new jobs and improved income for marginal farmers/laborers)**
- **Generation of foreign exchange**
- **Improved resource (land, labor, capital) use**
- **Improved nutrition**

V. Developing a Strategy for the Agribusiness Sector
B. Principal Opportunity Areas

The first step in formulating an agribusiness strategy for Nicaragua is to identify the products/markets that offer the best opportunities for long-term competitiveness and profitability.

- Naturally investors are free to invest in any area. As policies are liberalized, investors may enter any activity that they believe makes economic sense. The designation of priorities seeks to ensure that Government and donor resources concentrate their resources on alleviating constraints where the economic impact is judged to be the greatest.

Given relatively free market policies, private investment will naturally flow to the most profitable activities. However, the dilemma facing government is whether to invest its limited resources in restructuring currently less profitable or competitive activities in the hope that they can be "winners", or whether to focus resources on encouraging further investment in established or future "winners".

- The question must be answered by determining where the best sustainable returns (in terms of jobs, foreign exchange) can be "earned" from the investment of public funds.
- The experience of other countries suggests that "restructuring" initiatives tend to be very costly, especially since there is only some chance of achieving competitiveness.
- The experience of other countries in picking "winners and losers" has rarely been successful.

V. Developing a Strategy for the Agribusiness Sector

B. Principal Opportunity Areas

The Growth/Competitiveness Matrix illustrates the relative attractiveness of various commodity systems for Nicaragua (see figure). The vertical axis measures the projected growth rate of the value (volume times price in constant dollars) of world trade through the year 2000 (as projected by the World Bank). The horizontal axis indicates Domestic Resource Cost (for 1991) as a proxy for international competitiveness. The area of the circles indicates the value of current Nicaraguan sales.

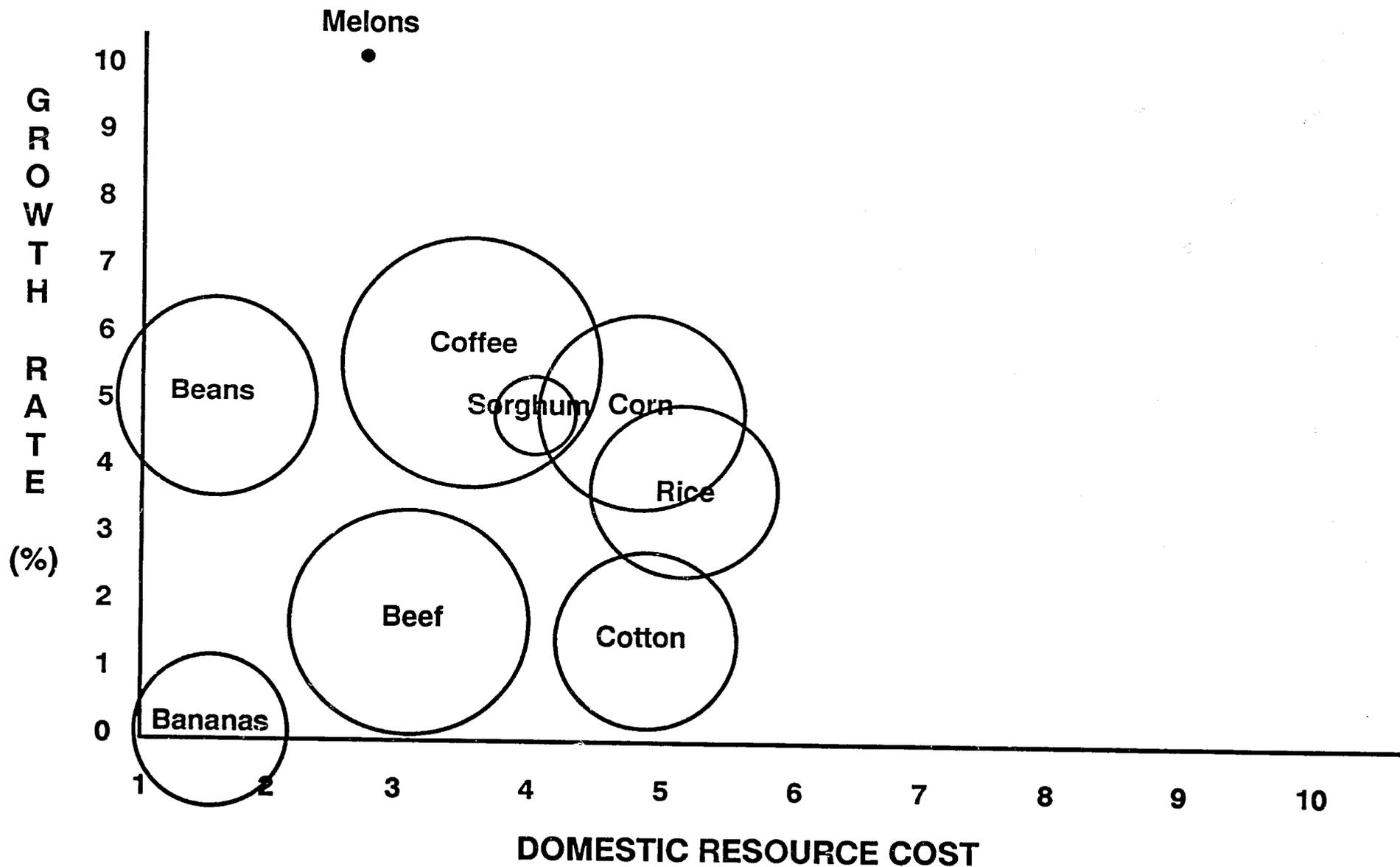
The matrix shows beans, coffee, meat and bananas to be the most attractive opportunities.

- Although bananas is low on the vertical axis, the high level of competitiveness makes further investment profitable, at least in the medium term. Part of the profits can be re-invested in other attractive systems.
- Beans, meat and coffee have market growth potential which can be capitalized on with investments to further improve competitiveness (move to the left on the DRC axis).
- Melons (as a proxy for non-trationals) shows great market potential. However, the base is extremely small and the investment and managerial requirements for significant growth are substantial. On the other hand, the need for experimentation and development of future "star" performers, especially to begin replacing the poor performers, is graphically indicated.

The commodities with low levels of competitiveness (cotton, rice and corn), also tend to be the ones with the lowest projected growth rates. This raises doubts as to whether the investments and efforts required to try and make these commodities more competitive are justified by the potential returns.

- Even if a major effort is made to increase yields and reduce costs to allow Nicaragua to "catch up" to world levels, by that time world prices and productivity will have moved on to new levels.
- However, it must be emphasized that some growers are, and will continue to be profitable/competitive in these products. The principal issue is what to do about the large numbers of producers who are not.

GROWTH RATE - COMPETITIVENESS MATRIX NICARAGUAN AGRIBUSINESS



V. Developing a Strategy for the Agribusiness Sector

C. Issues/constraints

Low productivity is by far the most important problem facing Nicaraguan agriculture in general, including the most promising opportunity areas. The key contributing factors, which must be addressed, include:

- **Poor returns to technology** - Yields on "technified" farms are not sufficiently high to earn a return on the capital employed, hence profitability is generally lower than it is on farms using rudimentary technology. A number of factors appear to be responsible, including poor management and techniques, decapitalization, inappropriate or obsolete technology, high costs of inputs, and monopoly marketing. **All of these result in an inadequate return to farmers (large and small) on investments in superior technology and discourage the adoption of improved technologies, even if available.**
- **Lack of effective technology transfer mechanisms and service institutions** - input suppliers and marketing agents presently lack incentives to work closely with producers. There is little competition (competition for clientele, reliable and high quality supplies). Similarly, existing associations focus on gaining policy concessions rather than providing services to their constituencies. **The problem is especially acute for small-medium scale farmers who tend to be treated in a paternalistic fashion by overly centralized institutions.**
- **Policies which distort market signals** - These include the **central allocation of credit** on the basis of formulas, **controls on imports and exports of basic grains** (which for example have seriously depressed the price of beans), and preferential tax and foreign exchange regulations for "non-traditional" products.
- **Limited R & D** to develop/test improved and commercially attractive varieties and technologies and to determine new product opportunities, especially in regions currently dedicated to economically marginal products.
- **Bias in the allocation of resources:** from the interior to the Pacific coast, from crops with a future to those with a past.

V. Developing a Strategy for the Agribusiness Sector
 C. Issues/constraints

The key issues/constraints affecting the most promising product categories are summarized below:

Commodity	Short Term	Medium Term	Long Term
Beans	Export ban	Need for new varieties for export markets Improvement of yields	Improve technology
Coffee	Low yields Deferred care/decapitalization of plantations Lack of medium term financing Need for private traders	Outdated management practices Rudimentary small farm technology/ lack of incentives and mechanisms for improvement Poor condition of rural roads	Need for improved varieties Need for aggressive marketing strategy (including niche mktg./ product differentiation)
Cattle/Beef	Lack of meat quality control lab Inadequate return for producers to improve quality Low reproductive rate	Weak packer/producer linkages Need to develop higher value (niche) markets Need for medium term credit for herd improvement	Poor quality forage
Bananas	Need for foreign investment Incomplete privatization of BANANIC	Mediocre quality	Lack of long term market strategy (differentiated product)
Non-trationals	Lack of know-how Lack of marketing/market access Lack of refrigerated infrastructure Unreliable support from public agencies: customs, phytosanitary	Infrastructure investment High cost transport Lack of local development	Limited market size for each product Late arrival in marketplace

What emerges is a general problem with low yields, poor quality and non-differentiated products and access to markets. While addressing these constraints will unquestionably require improved know-how and technology, more critical are the need for adequate incentives for producers to improve yields/quality and dynamic mechanisms for transferring the know-how and providing the access to markets.

V. Developing a Strategy for the Agribusiness Sector

D. Strategies

The primary policy initiative should be trade liberalization such that investment will flow into the systems that make the most economic sense for Nicaragua -- those with good market potential, an important labor/domestic component, modest infrastructure/know-how requirements, and where possible, efficient production on small-medium scale units.

Over the short and medium term, the most rapid growth can be expected in export products, especially coffee, but also cattle/meat, bananas, and beans.

- These products are competitive today and have the best market potential, allowing for expansion and in some cases the generation of significant numbers of jobs (or higher incomes).
- Higher incomes will generate domestic demand for additional food products such as poultry/sorghum, vegetables and grains.
- Part of the earnings from the export sector should be reinvested in product development aimed at further improvement of these key products, as well as system coordination that will lead to higher "non-traditional" exports and other new products/varieties such as oil seeds.

Expansion of agricultural output will largely result from the improvement of yields of better quality crops.

- The key will be to allow free access to export markets, and to promote vigorous competition among suppliers of inputs and credit, as well as processors and marketing agents, in order to reduce costs and improve prices to producers, as well as to stimulate greater incentives among these intermediaries to build strong relationships with their clients.

Improvement of nutrition levels in urban areas can best be achieved by seeking the cheapest and best sources of food. Much of this can be efficiently supplied domestically (beans, and possibly sorghum, dryland rice) but some could be more efficiently imported, freeing up land for crops that better utilize scarce resources.

V. Developing a Strategy for the Agribusiness Sector

D. Strategies

The policy framework is a critical component of the overall strategy. In general, these should be aimed at ensuring a optimal use of resources, access to markets and vigorous competition. While implementation of some policies may require a phased process, all of the following are indispensable as soon as possible:

- **Elimination of the system of central allocation of credit by commodity** and its replacement by standard business criteria. In order to ensure that small farmers receive credit (if they are involved in profitable activities), non-bank sources of financing such as trading companies/marketing agents, input suppliers, and credit co-Ops should be encouraged.
- **A competitive exchange rate** should be maintained which encourages labor intensive products while discouraging excessive imports.
- **Free access to export markets** for all products and a minimum of regulatory procedures for processing export/import related paperwork. Conversely, **imports should also be liberalized**, including food products/grains.
- **The elimination of legal and administrative barriers to entry, and promotion of competition**, for firms/co-ops to provide services to agriculture, including:
 - importation and distribution of inputs
 - purchasing, processing and marketing of output
 - provision of credit (including non-bank sources)
- **Reliance on markets to determine prices**, with government regulation focused on eliminating collusion and anti-competitive practices.
- **Continued emphasis on privatization of state companies**, especially those involved in marketing/processing and inputs. However, **public monopolies should not be replaced by private monopolies**.

Ensuring an appropriate policy framework is the primary role of the Government; implementing programmatic initiatives required to stimulate investment in improved productivity will require leadership from the private sector.

V. Developing a Strategy for the Agribusiness Sector

D. Strategies

Keeping in mind the focus on improving yields/productivity, especially in the priority products indicated above, the most important short term strategic initiatives for implementation include the following:

- **Promotion of investment by progressive traders, processors and other marketing agents** likely to provide improved access to markets (or new segments) and/or to work proactively with farmers to improve quality and yields. This would include Nicaraguan emigres (especially those with foreign marketing expertise) and foreign agribusinesses. It also involves promoting joint ventures between producers and these firms. Privatization should also focus on buyers likely to improve the linkages with producers.
- **Encouragement of grass-roots and regional associations, co-ops and other local private initiatives** aimed at providing services (marketing, credit, bulk purchasing of inputs, management training and information) and/or involved in identifying and testing new product opportunities and/or improved technologies.
- **Medium and long term financing vehicles**, including funds provided by donor agencies and access to foreign capital through debt/equity transactions and discounting of export contracts.

Over the medium term, primary initiatives would include:

- **Human resource development** at all levels, including management, technical and labor.
- **Infrastructure improvement**, emphasizing key bottlenecks such as roads in coffee producing areas, storage and transportation facilities for perishables, and port improvement (including possibly an Atlantic port.)

V. Developing a Strategy for the Agribusiness Sector

E. Priorities for Donor Agencies

Donor agencies will have to play a key role in finalizing and implementing the strategy. An initial priority should be conditioning financial support to the development of a coherent strategy and implementation of key policy reforms. Likely programs requiring donor support include:

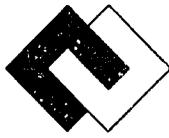
- **Institutional strengthening of regional/local producer associations and/or co-ops with an emphasis on establishing or strengthening services to members.**
- **Establishment of medium-term credit facilities (privately administered) for the rehabilitation of coffee, improvement of beef cattle, and development of other export projects.**
- **Supporting the establishment of private financial institutions, non-bank sources of finance and access to foreign capital.**
- **Strengthening the data collection and policy analysis capabilities in the Government and private sector.**
- **Helping identify and follow-up new market and product opportunities, especially substitutes for mechanized corn, irrigated rice and cotton, oil seeds to complement grains, and/or new export possibilities.**
- **Facilitating the privatization of state-owned enterprises.**
- **Supporting efforts to introduce new concepts in labor/management relations, agribusiness management and investment opportunities (seminars, conferences, publications).**
- **Supporting the establishment of private foreign investment promotion efforts.**

V. Developing a Strategy for the Agribusiness Sector

F. Next steps

The strategies recommended above are intended as prototypes. A final strategy will be "owned" by the Nicaraguan Government and key interest groups and require the following steps:

1. **Review and refine the strategy with key Government officials and private (large and small scale) sector groups.**
2. **Organize and conduct workshops with top level representatives from critical interest groups, in order to forge a consensus strategy, commitment to implementation and agreement on who will provide the leadership for implementation.**
3. **Obtain support from donor agencies.**
4. **Disseminate and publicize widely.**



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CARANA Corporation

**FRAMEWORK FOR AN AGRIBUSINESS
STRATEGY IN NICARAGUA**

VOLUME II

for

USAID/Nicaragua

Prepared By CARANA Corporation

and

Sparks Companies

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4350 North Fairfax Drive, Suite 500, Arlington, VA 22203 USA

telephone: (703) 243 1700 fax: (703) 243 0471

CORAL GABLES, FLORIDA

SAN JOSE, COSTA RICA

LA PAZ, BOLIVIA

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I. INTRODUCTION

CARANA Corporation and Sparks Companies were retained by USAID/Nicaragua to conduct a series of studies of the agricultural sector and to help facilitate the formulation of a comprehensive agribusiness strategy. The summary of conclusions and recommendations, and the implications for an agribusiness strategy have been presented under separate cover as Volume I. This second volume incorporates some of the more detailed analyses that have been used as key inputs for Volume I.

This second volume is organized into the following sections:

- I. Current State of Nicaraguan Agriculture, providing an overview of recent agricultural performance and some of the key issues and problems. This section also includes analyses of the competitive position of Nicaraguan agriculture (nominal and effective protection and domestic resource costs) as well as projections to the year 2000 under alternative policy scenarios, especially for basic grains.
- II. The Structure of Agribusiness Systems in Nicaragua takes a systems approach to analyzing selected commodity systems. After discussions with USAID and Nicaraguan Government and private representatives, the systems selected for study included: coffee, cotton, bananas, melons (as an example of non-traditionals), corn, beans, rice, sorghum and poultry. These account for most of the crop sector, with the most obvious omission being cattle, which was already being studied by other USAID consultants. The system analyses focus first on markets and then on the structure of the integrated production/input/and distribution system in Nicaragua.
- III. The Present State of Man-Land Relations in Nicaragua, an analysis of the land tenure situation prepared by Stephen Miller. This section focuses on the effects on agricultural production and productivity of tenure relations, social relations and other aspects of man-land relations in Nicaragua. Special efforts have been made to determine trends since the election of 1988.
- IV. Statistical Annexes present the detailed crop balances, projections and domestic resource cost analyses prepared as part of the project. The lack of reliable and consistent data was one of the principal hurdles encountered in conducting this study, and the statistical tables presented here represent our best efforts in reconciling many of the difficulties with Government information. The data base is available on diskette for further analysis.

II. CURRENT STATE OF NICARAGUAN AGRICULTURE

A. OVERVIEW

Agriculture is the most important sector of the Nicaraguan economy with just under one-fourth of the GNP (24 percent in 1990) and 73 percent of export earnings. Most of the sector's value added is from crops (61 percent of the total; 35 percent from export crops, 20 percent from basic grains and 6 percent from other crops). Just over one-third of the value added comes from livestock (primarily beef), 3 percent from fishing and 1 percent from forestry.

Both basic grain and export crop production are crucial to the nation's food supply and economy. Nearly 40 percent of the arable land is used to produce for export (primarily coffee, cotton, sesame and sugar cane, but including bananas, tobacco and peanuts). The seven most important agricultural exports in 1990 accounted for \$236 million of the nation's \$321 million total. Coffee alone made up 21 percent of the total, and together with sugar, cotton and bananas accounted for nearly 50 percent of the total. (Table II-1)

Corn is the most important basic grain (with 47 percent of harvested area in 1990), followed by beans (28 percent) with the remainder accounted for by sorghum and rice (14 percent and 11 percent, respectively). Most of the Nation's production is used for direct human consumption or animal feed (While there is virtually no commercial trade in basic grains, donations have become very substantial in recent years amounting to just over 135,000 mt in 1990, 19 percent of consumption). By contrast, exports amounted to just under 10,000 mt.

Nicaragua's agricultural sector has been under intense economic pressure in recent years, both before and after the new administration came to power in 1990. During its decade-long reign, the Frente Sandinista de Liberacion Nacional (FSLN) presided over an unprecedented economic collapse:¹

- Gross Domestic Product (GDP) per capita fell seven of the last eight years of Sandinista government, and was below 1960 levels by 1989;
- Inflation accelerated during almost every year since 1979, reaching 33,000 percent in 1988;
- Wages fell to less than 10 percent of the 1979 level by 1989;

¹ CARANA Corporation, "Nicaragua's Political Economy: The Role of the Private Sector", Prepared for USAID/Nicaragua, June 21, 1991.

Table II-1

TRADITIONAL AGRICULTURAL EXPORTS

	1988	Volume 1989 (000qq)	1990	1988	Price 1989 (dollars/unit)	1990	1988	Value 1989 (mil \$)	1990
COFFEE	674.0	733.0	816.0	124.5	125.5	122.4	84.6	89.6	67.6
COTTON	756.5	532.9	524.8	70.2	52.3	69.7	53.1	27.9	36.6
SESAME	57.3	66.5	136.7	41.5	47.9	61.0	2.4	3.2	8.3
BANANAS	3859.0	3878.0	4828.0	3.8	5.4	4.8	14.7	21.0	23.0
SUGAR	751.4	1698.1	2530.9	7.2	10.2	13.7	5.4	17.2	34.6
MOLASSES		440.9	661.4		1.6	1.9		0.7	1.2
MEATS	21.0	44.6	65.1	0.9	0.9	1.0	19.3	40.6	64.6
TOTAL	6119.2	7394.0	9562.9				179.5	200.2	235.9

- International indebtedness increased by more than 7 times the level at the beginning of the Sandinista Revolution, reaching nearly \$10 billion in an economy with a GDP smaller than \$1 billion.

Following the February, 1990 election of the UNO coalition, the new government was forced to concentrate primarily on national reconciliation rather than economic policies, and economic deterioration continued (a drop in GDP of nearly 6 percent; central government fiscal deficits of 20 percent of GDP, inflation of 30 percent per month).

The government announced its new stabilization plan in March, 1991 with strict limits on money supply growth and credit, a series of programs to reduce public sector deficits, a privatization program for state owned enterprises and reform of the nationalized banking system. Nevertheless, the system continues to lack clear, legally enforceable rules governing private enterprise and property rights, government enterprises and other interventions continue their predominant role in the economy (control of the banking system and a weak and politically polarized private sector), and there is a serious lack of information and experience in developing and expanding markets and investment across the economy.²

In general, Nicaragua's economy is small, heavily protected and highly subsidized. In 1990, exports were \$321 million, while imports reached \$592 million, an imbalance that will seriously limit the nation's capacity to invest and grow. Gross investment fell 9.1 percent in 1990, and private investment declined nearly 3 percent. And, while the government is committed to expanding trade very serious constraints remain. The cordoba has been devalued, (but appears to continue to be overvalued despite a sharp decrease of inflation). Trade rules have been liberalized (tariffs cut, private firms given freedom to export) but a large number of non-tariff barriers remain including requirements for import and export licenses and formal approvals for foreign exchange to import, and others.

An additional constraint on Nicaragua's agricultural sector is the residual structures and uncertainty remaining from the Sandinista land reform programs and uncertain land titles (See Chapter III).

² For example, state firms account for 31% of GDP and 9% of employment. Virtually all exports and imports have until recently been controlled by state franchised monopolies; enterprises that are highly inefficient and are a major source of GON's fiscal deficit, and which provide poor services across the economy.

The GON is moving to privatize more than 300 firms (ranging from restaurants and discotheques to cement factories and fishing fleets) through the creation of CORNAP, the government holding company responsible for privatization of state enterprises.

B. AGRICULTURAL POLICIES

The Sandinista agricultural policies were highly interventionist at all levels of production, marketing, distribution pricing and trade. In addition to shifting large amounts of land into state farms and cooperatives, the GON controlled markets and marketing through parastatals that served as purchasing and distribution channels. It also controlled exports and imports of agricultural products and inputs, and the distribution of credit and foreign exchange.

For example, ENABAS, the basic grains marketing agency, has been responsible for the purchasing and distribution of corn, sorghum, and beans (and the handling of rice in cooperation with NICARROZ). ENABAS maintains 160,000 mts of storage capacity (100,000 mt of upright storage) located strategically throughout the nation. (Chart II-1) ENABAS purchase prices are based on world prices and domestic production and marketing costs and sells at administered prices in local markets.

ENABAS's primary strategy is to purchase grain at harvest when prices are at seasonal lows and sell as required throughout the year. Seasonal patterns of ENABAS corn and sorghum stocks tend to be high during October-February, reduced to minimal levels during the March-August period, and then increased steadily during September-February.

Off farm sales of corn, beans and rice, and purchases by ENABAS during 1990-91 are shown on Charts II-2, II-3, and II-4. Purchases vary sharply by month, have been declining rapidly and generally amount to a relatively small share of total farm sales. Because of its control of storage and distribution facilities, ENABAS plays a relatively larger role in urban markets, for example, with more than 70 percent of urban corn sales in October, 1990.

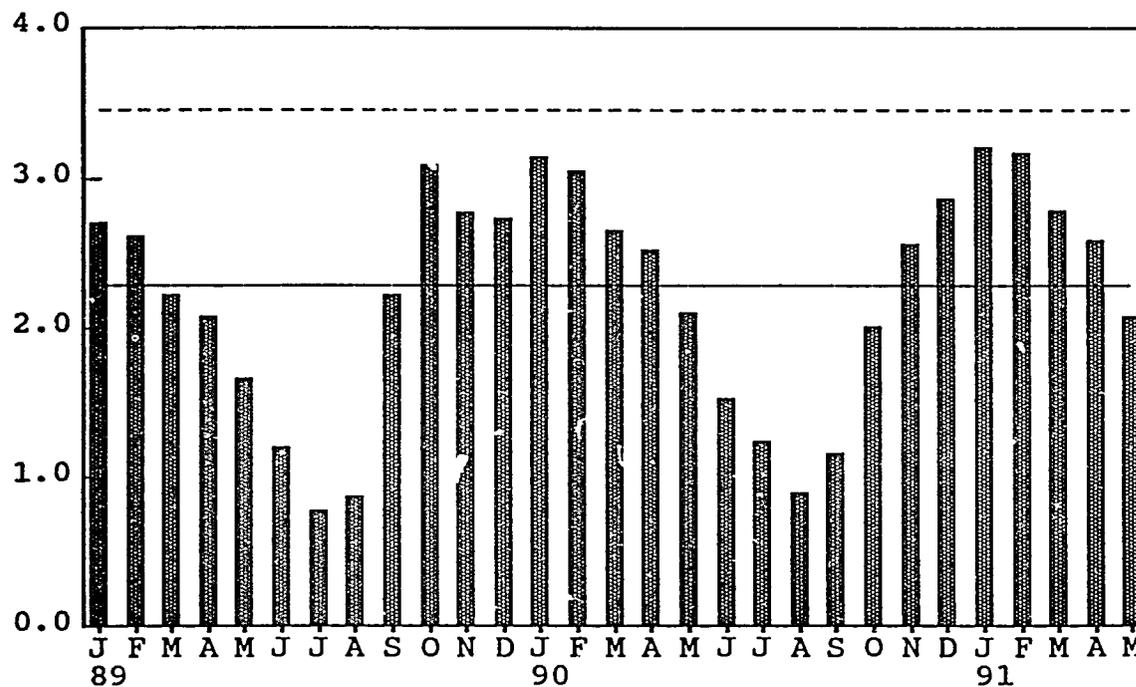
ENABAS's role in regulating food supplies by controlling basic grain stocks regulating producer prices and importing and selling food stuffs is the most far reaching government intervention in Nicaraguan agriculture, but it is by no means an isolated activity. The Sandinista government intervened at every level in the provision and pricing of agricultural inputs, agricultural production, and in the collection, processing and marketing of products, and many of those policies have changed only slowly. Examples include:

- Provision of subsidized credit, with allocations by subsector. While levels of subsidy have declined, allocation policies continue.
- Provision of fertilizers, agricultural chemicals, fuel and machinery through state owned enterprises, with regulated pricing structures (with inputs sold to producers at up to 2.4 times the CIF price);

Grain Storage Capacity
(Upright Bins)

(million cwt)

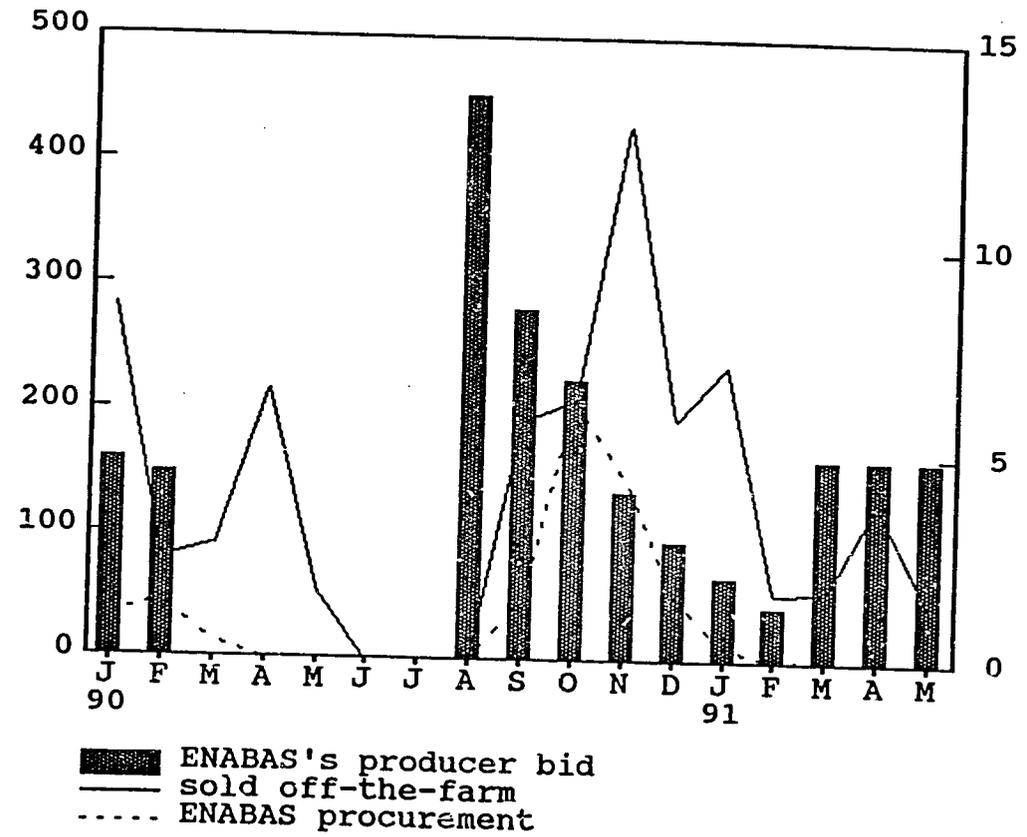
Thousands



corn + sorghum carryout
 terminal upright capacity
 total upright capacity (incl DAPs)

Corn
Sales Off-the-Farm & ENABAS Procurement

k cwt



7

Chart II-3

Edible Beans
Urban Consumption & ENABAS Sales

k cwt

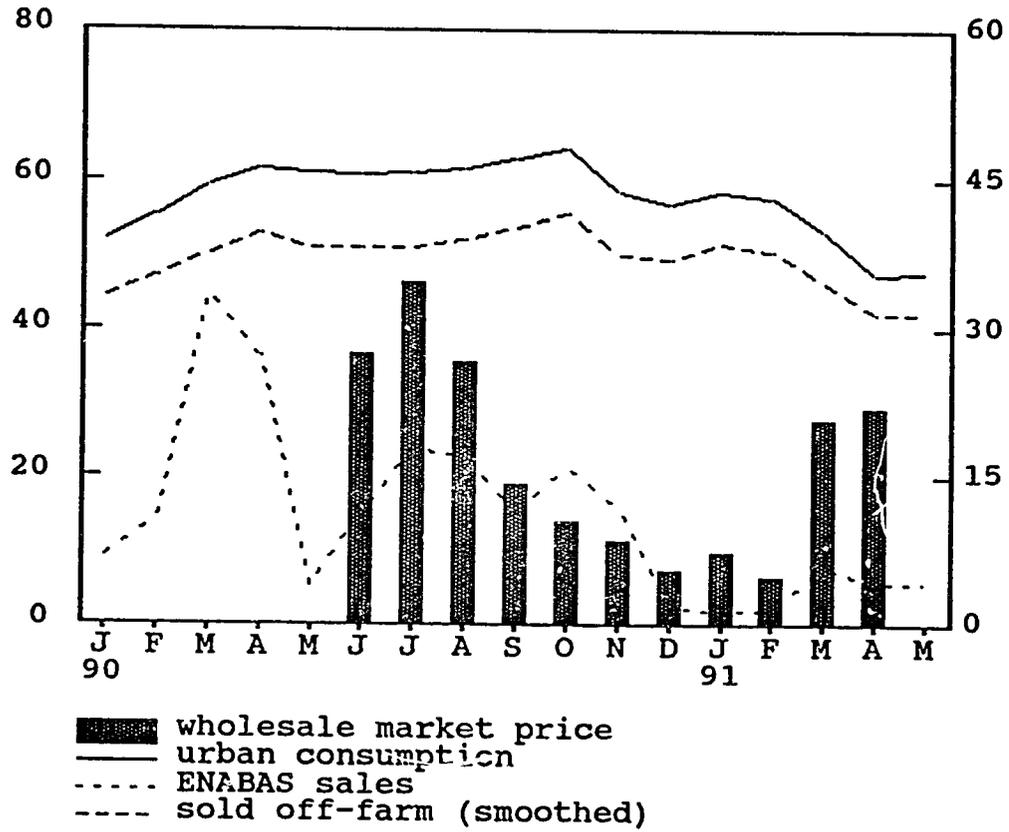
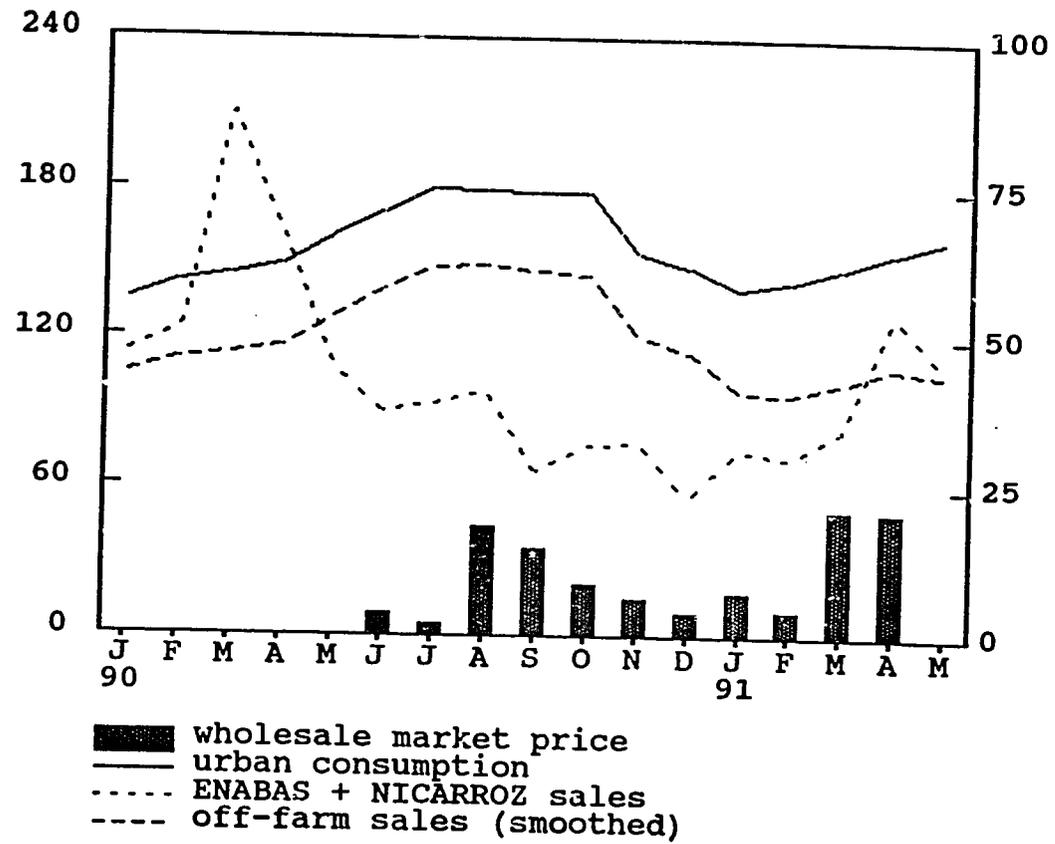


Chart II 4

Rice
Urban Consumption and ENABAS & NICARROZ...

k cwt



- **Agricultural product marketing through parastatals, such as: ENABAS, NICARROZ, ENCAFE, ENAL, BANANIC and others;**

The role and importance of these institutions is discussed in more detail in the context of individual commodity subsector in following sections. In general, they have proven costly to operate, highly bureaucratic and rigid. Because their operating costs are high, they widen the spread between market prices and prices received by farmers and reduce producer returns, production incentives and sector responses to market growth and change.

Nicaragua's parastatal dominated marketing structure has an additional impact in that it distorts both economic incentives and production signals. Whereas free markets indicate to producers shifts in demand (and in competing supplies) through changing market prices, Nicaragua's parastatals tend to both distort normal price shifts changes through market interventions and mask them by imposing high costs and wide marketing margins. The resulting distortions in producers incentives have led to uneconomic shifts in both crop and livestock production and consumption.

Because the distortions reduce production investment throughout the sector, they also reduce producers' incentives to increase productivity, one of the underlying reasons for recent slow growth in crop yields in Nicaragua.

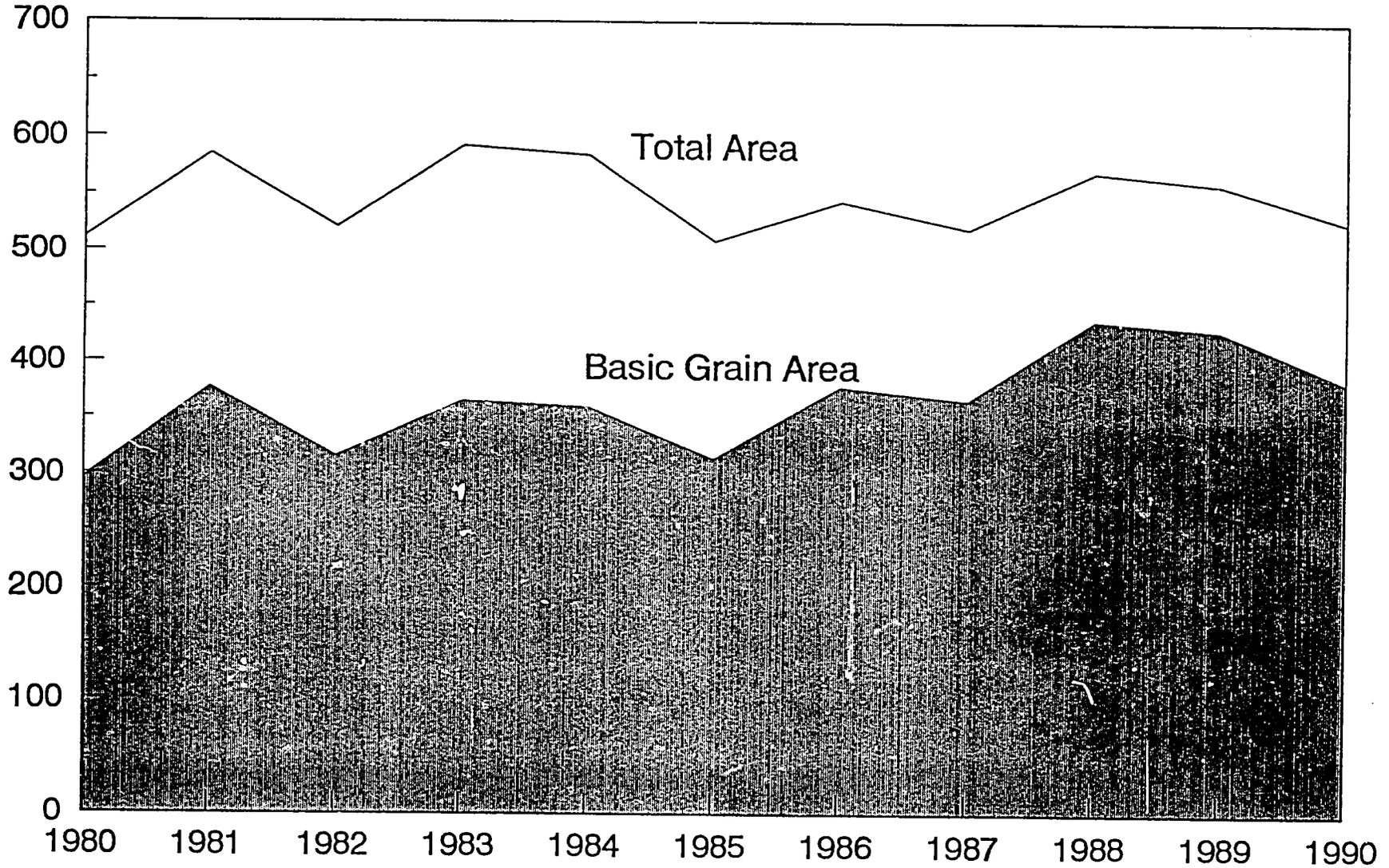
C. RECENT AGRICULTURAL PERFORMANCE

Agricultural production patterns have been quite complex in Nicaragua in recent years. Basic grain production increased intermittently through 1988, while export crop output has been declining since 1983. However, world prices of several export crops increased sharply in 1989 and were relatively strong in 1990 for sugar, sesame seed, cotton and meats while the U.S. markets also reopened. Nicaraguan producers responded with increased output. Sugar and meat export volume more than tripled during 1988-90; sesame sales more than doubled, while banana shipments increased 25 percent. Shipments of traditional exports increased 21 percent in 1989 and 29 percent in 1990. In spite of the fact that world coffee prices were weakening during the period, the value of exports increased 11 percent in 1989 and 18 percent in 1990.

By contrast, basic grain production was hit hard by the enormous increases in input costs (and by the collapse of the domestic poultry market and poultry production). Corn production stabilized after 1988 and basic grain production has been stagnant during 1988-89 in spite of growing needs (See Chart II-5). Harvested area for the four crops dropped precipitously during 1988-90 (by 119,000 ha; 25 percent). However, unusually good bean and corn yields were sufficient to increase production nearly 5 percent during the period in spite of cost pressures to reduce levels of investment in fertilizers, soil preparation, crop treatment and other factors. Since population is increasing at an average annual rate of about 3.3 percent, basic grain

Total Area -vs- Basic Grain Area

('000 Ha)



11

production per person is being reduced slowly under the current trends³. The sharp reductions in corn, sorghum and bean area after 1988 imply reductions in production potential, since recent yield declines imply little likelihood of rapid productivity growth in the near future especially as long as economic incentives for basic grain production continue to be low. (Charts II-5, II-6 and II-7)

The stagnation in basic grain output has meant very significant declines in availability per person, an enormously important trend because of the nation's dependence on domestic production of these crops for its food supply. Commercial basic grain production was 384,000 mt in 1990. These locally produced products, together with 115,000 mt of donations, provided just under two-thirds of domestic food consumption.⁴ On farm food consumption, normally a very important component of the nation's food supply, has been increased significantly by recent economic contraction which have increased the number of subsistence farmers. The grain products together with sugar and imported flour provide more than 86 percent of the nation's energy supply.

In 1980, an average of 2129 calories per day were available in Nicaragua, with 1562 calories available from domestic grains and sugar. By 1990, total daily calories had declined to 1536 (28 percent), with 1242 available from domestic grains and sweeteners. In addition, donations of grains constitute nearly 20 percent of the total domestic supply (See Table II-3).

D. COMPETITIVE POSITION OF NICARAGUAN AGRICULTURE

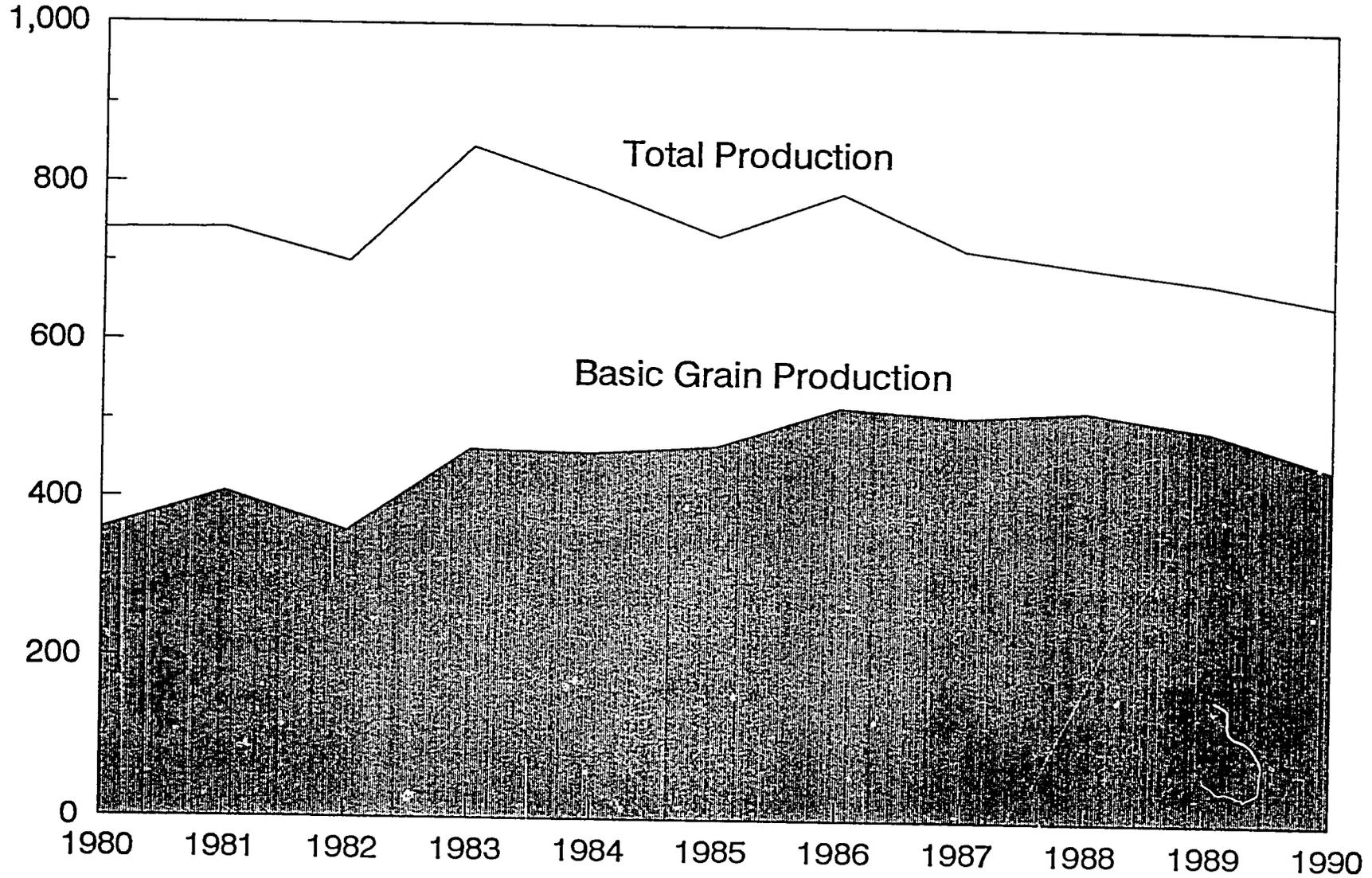
One important characteristic of basic grain production in Nicaragua is its small scale, a function of its traditional agricultural organization and limited markets. However, the sale of basic grains produced in Nicaragua to nearby countries, now restricted by GON policies, could improve economic returns to the industry and lead to increased investment and production if producers could sell legally and competitively into those markets.

³ Some notable shifts in land use have occurred over the past decade. The total amount of land devoted to basic grains sporadically increased from 296,000 ha in 1980 to 438,000 ha in 1988 before declining to 329,000 ha in 1990. Harvested area in export crops followed an opposite trend (declining from 215,000 ha in 1980 to 205,000 in 1982 and to 142,000 ha in 1990).

⁴ Program Alimentario Nicaraguense, "Balances Alimentarios; 1980-90" PAN is an inter-ministerial committee charged with developing information for governmental use. The estimates in the report cited reflect clean, wholesale weight products that move through commercial channels. They do not reflect on-farm or other non-commercial consumption, and other significant (but unknown) consumption amounts. Nevertheless, food consumption estimates on this basis are widely used in Nicaragua and elsewhere.

Total Production -vs- Basic Grain Production

(TMT)



Yields for Basic Grains

(MT/Ha)

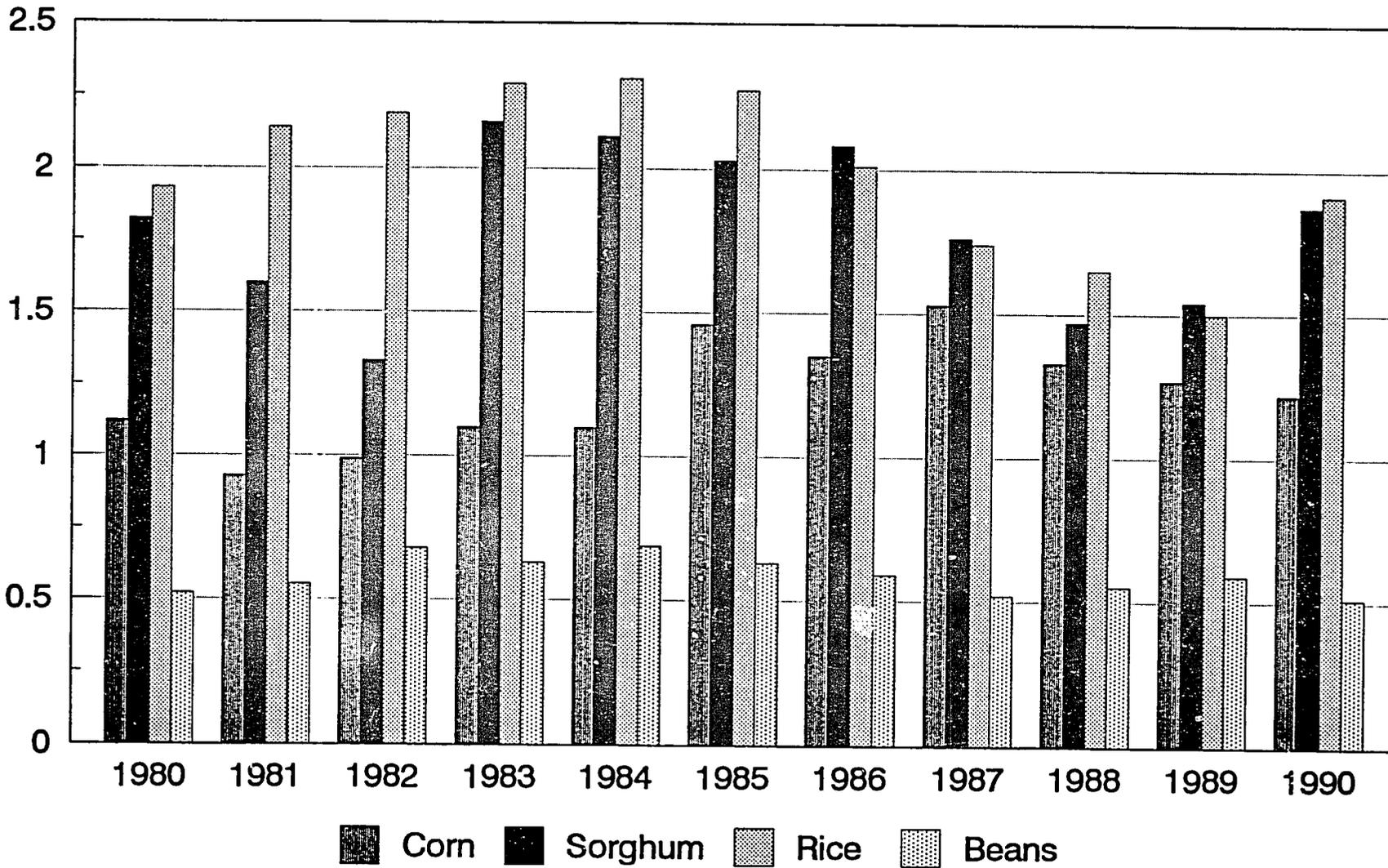


Table II-2

DIETARY SHARE OF MAJOR FOODS

<u>FOOD PRODUCT</u>	<u>(KCal/day)</u>			<u>(percent)</u>		
	<u>1980</u>	<u>1985</u>	<u>1990</u>	<u>1980</u>	<u>1985</u>	<u>1990</u>
RICE	430	351	275	20.2	15.1	17.9
CORN	631	774	530.9	29.6	33.4	34.6
WHEAT	205	148	85.1	9.6	6.4	5.5
BEANS	141	154	153.4	6.6	6.6	10.0
SUGAR	360	522	283.2	16.9	22.5	18.4
OILS	86	107	66.9	4.0	4.6	4.4
BEEF	85	58	19.7	4.0	2.5	1.3
PORK	28	24	10.1	1.3	1.0	0.7
POULTRY	17	20	13.6	0.8	0.9	0.9
MILK	123	123	80.7	5.8	5.3	5.3
EGGS	23	36	17.4	1.1	1.6	1.1
TOTAL	2129	2317	1536	100.0	100.0	100.0
Donations	8	123	303.8	0.4	5.3	19.8
Local Production	2121	2194	1232.2	99.6	94.7	80.2

Export restrictions tend to reduce economic returns and production incentives in any nation, and Nicaragua is no exception. Except in acute shortage situations and in the absence of production subsidies to offset the restrictions, trade limits tend to work counter to their purpose and limit domestic availability (and increase reliance on imports for many products where imports are permitted) since they limit markets, reduce production scale and efficiency and diminish investment. And, they encourage contraband trade. The most immediate measure of competitiveness is CIF costs of Nicaraguan commodities delivered to nearby markets, the nominal protection rate.

While Nicaraguan economic policies have held basic grain prices above world prices in recent years (indicated by nominal protection rates), the comparison between production costs and competitive market prices in nearby markets indicates that Nicaraguan producers have the potential to compete in several of these markets at least part of the time.

Domestic basic grain producers are protected from competition from international producers in several ways. The most important and intrusive are quantitative trade restrictions, requirement for import licenses and approval for foreign exchange to buy on world markets. The impacts of these policies are reflected in measures of "nominal" and "effective" protection.

The nominal protection rate compares domestic and world prices for products (at a given reference point) (See Table II-3).⁵ It is a general measure of government price and market intervention (although prices depend on local supply and demand factors so that most measures of protection vary depending on local weather conditions as well as government policies). In general, countries with high rates of protection tend to be importers who are protecting domestic industries from international competition.

Protection normally is achieved by a combination of ad valorem and quantitative restrictions on imports. In Nicaragua, import duties are low and fixed (and are not applied to direct imports by the Government). However, wheat imports by the grain millers and corn imports by poultry producers pay 1 percent ad valorem, CIF. Corn imports under Section 416 (by ENABAS) are duty free as are imports of beans (or other basic grains).

⁵ The nominal protection rate compares domestic and international prices and measures the degree, in percentage terms, by which domestic prices are smaller or greater than international prices. If the result is less than one or negative, the product is unprotected. A result that is greater than one shows protection.

Table II-3

PRODUCTION COSTS: BASIC GRAINS, 1991

	YIELD (qq/mz)	COST C\$/qq	PROTECTION NOMINAL	RATES EFFECTIVE	PRICE MANAGUA	RETURN
CORN:	18	35.99	1.01	1.01	40.00	4.01
Hand Labor	40	38.64	1.01	1.02	40.00	1.36
Mechanized	50	41.16	1.00	1.00	40.00	-1.16
BEANS:						
Hand Labor	10	78.1	0.59	0.59	110.00	31.90
With Oxen	12	110.55	0.59	0.50	110.00	-0.55
Mechanized	15	80.75	0.59	0.50	110.00	29.25
Irrigated	20	110.35	0.59	0.50	110.00	-0.35
RICE:						
Hand Labor	12	85.75	0.93	0.93	105.00	19.25
	24	70.92	0.94	0.94	105.00	34.08
	42	113.86	0.94	0.91	105.00	-8.86
SORGHUM:						
With Oxen	36	34.04	1.10	1.16	40.00	5.96
Mechanized	45	34.63	1.08	1.11	40.00	5.37

GON does not provide significant amounts of direct protection for any basic grain; for corn and sorghum, domestic prices are very slightly higher than world market prices (1 percent for corn, 8 to 10 percent for sorghum), and for beans and rice protection is negative indicating that GON interventions in 1991 have kept prices below world levels. This implies that these crops would be expected to be able to compete effectively on world markets if they can be produced profitably at these prices.

A second crucial measure of competitiveness is producer returns under current policies, and given current costs. Each of the basic grains has positive returns for production with hand labor, but as levels of input use increase, returns decline and, for most, become negative. Mechanized corn production, for example, is unprofitable at current prices. Bean production is profitable for non-mechanized production and for mechanized production without fertilizers or other inputs, but not under irrigation. Sorghum production is profitable for both traditional and mechanized production. Thus, sorghum, beans and corn would appear to have potential to compete in regional markets at very slightly lower levels of protection if local production efficiency could be increased.

While duties are quite small in Nicaragua, the GON does protect the sector through its import licensing process, although also undercuts local prices through its commercialization of donated inputs and of a broad range of other products at artificially established prices. In general, imports and exports of grain (and grain products) are regulated to meet needs identified by a highly political process. The result is small amounts of protection for feed grains (corn and sorghum), but negative protection for beans and rice.

1. Effective Protection Rates

The effective protection concept focuses on value added, and compares that measure (returns minus cost of materials) for domestic producers with those in the international market. The purpose of the calculation is to estimate at once the net impact of all measures that affect either producers' prices or their costs. Thus, costs (such as taxes) and cost subsidies that are not reflected in measures of nominal protection may be seen in measures of effective protection.⁶

⁶ While the use of effective protection measures is relatively common, substantial practical difficulties are involved in their measurement because definition of value added is difficult. For example, the domestic value added from a number of production and marketing steps must be considered, each with both domestic and imported components. Thus, estimates of the value added component of imports are necessarily quite arbitrary. [cont. on next page]

In Nicaragua, producers have received a variety of subsidies including price supports, subsidized credit, favorable prices for fertilizers through exchange rate benefits, seeds, and others (benefits that are gradually being reduced or eliminated). However, the impact of these programs on producers' value added is small and effective rates of protection are relatively similar to the nominal rates. Effective rates likely will decline in the future as Nicaraguan markets become more open to international trade and investment.

2. Exchange Rates

Exchange rates affect the competitive position of agricultural commodities in very complex ways. An overvalued exchange rate makes export commodities more expensive than they would be otherwise, and thus reduces markets access and sales. However, it also reduces production costs by making imported imports cheaper than they would be otherwise, thereby stimulating production, especially of import intensive commodities. Thus, the net impact of shifts in exchange rate depends on the quantities of imported imports used in production.

For basic grains in Nicaragua, a devaluation in the exchange rate would be expected to reduce effective protection and substantially increase competitiveness. For corn, the effective protection would decline from just over 1 percent to -31 percent if the exchange rate were reduced from C\$5/\$1 to C\$8/\$1. For beans, the decline in protection is between 13 and 20 percentage points, while for sorghum the shift is between 41 and 36 percentage points (See Table 5).

3. Productivity

In addition to production input requirements and their costs, the major factor affecting production costs is yields. On a nationwide basis (for crops that nations depend upon heavily), relatively high average yields imply a large, well developed science base and competitive production. For example, corn yields in the United States (the highest yielding major U.S. grain crop) were 6.76 mt/ha for the 1986-88 period (including the 1988 summer drought, the most severe since the 1930s), nearly four-fold the average corn yield in Nicaragua.

[footnote 6 cont.]

As a result, it has become conventional to measure effective protection in terms of domestic costs of production plus the foreign exchange costs compared with the cost of importing and handling imports. This measure especially reflects the impacts of taxes, and subsidies. See, for example, Magdalena Garcia and Roger Norton, "Tasas de Proteccion Efectiva y Costo de los Recursos Domesticos," USAID/Honduras, May 1990.

Since effective protection rates are based on value added, they fully reflect year-to-year changes in unit costs and yields. Thus, increases in yields that change unit costs (and increases value added) can mean sharp changes in effective protection for that year. Increases in production subsidies that increase value added increase effective protection while taxes (and duties and import restrictions on inputs) increase costs, reduce value added and effective protection.

Table II-4

IMPACT OF EXCHANGE RATE CHANGES AND SECTOR COMPETITIVENESS, 1991

	Yield (qq/mz)	Cost C\$/qq	Official Rate Protection Rates		Equilibrium Rate* Protection Rates		Change	
			Nominal	Effective	Nominal (%)	Effective	Nominal (%)	Effective
CORN:								
Hand Labor	18	35.99	1.01	1.01	0.69	0.69	-0.32	-0.32
With Oxen	40	38.64	1.01	1.02	0.69	0.69	-0.32	-0.33
Mechanized	50	41.16	1.00	1.00	0.69	0.69	-0.32	-0.31
BEANS:								
Hand Labor	10	78.1	0.59	0.57	0.38	0.37	-0.21	-0.2
With Oxen	12	110.55	0.59	0.50	0.38	0.37	-0.21	-0.13
Mechanized	15	80.75	0.59	0.50	0.38	0.37	-0.21	-0.13
Irrigated	20	110.35	0.59	0.50	0.38	0.37	-0.21	-0.13
RICE:								
Hand Labor	12	85.75	0.93	0.93	0.61	0.61	-0.32	-0.32
With Oxen	24	70.92	0.94	0.94	0.62	0.61	-0.32	-0.32
Irrigated	42	113.88	0.94	0.91	0.62	0.59	-0.32	-0.32
SORGHUM:								
With Oxen	36	34.04	1.10	1.16	0.73	0.75	-0.37	-0.41
Mechanized	45	34.63	1.08	1.11	0.73	0.75	-0.35	-0.36

* Assumes a shift in exchange rate from C\$5/1 to C\$8/1

Nevertheless, Nicaraguan yields for rice and beans, crops with apparent export potential are greater than those of at least some neighboring countries. With Nicaraguan yields indexed at 100, Honduras' corn yields are similar, but those of their regional competitors are considerably higher. Both Honduras and Mexico have lower average yields for beans and Guatemala's yield is only slightly above that in Nicaragua. Nicaraguan rice yields are greater than those in Guatemala or Honduras, and nearly as large as in Mexico (See Table II-5).

4. Domestic Resource Costs

One major reason export markets are attractive is for the foreign exchange they generate. However, agricultural production requires the use of imported inputs and the net foreign exchange benefits from exports can be small if production requires heavy import use (See Table II-6).

Domestic Resource Cost (DRC) ratios reflect these characteristics. They compare the cost of producing (in terms of domestic products) and importing (in foreign currency terms) with the cost of producing adjusted by costs of imported inputs.⁷ Since the DRCs are presented in terms of the cost of saving units of foreign exchange by producing each of the crops in question, they respond directly to yield changes (and other cost shifts), but not to exchange rate changes.

In general, DRCs higher than the exchange rate indicate that local production is more costly in foreign exchange terms than imports (and therefore an uneconomic use of domestic resources), while low DRCs indicate potential currency savings from domestic production in spite of their use of imported inputs. Crops with the lowest DRC have the greatest potential for saving hard currency by increasing domestic production for export or to offset imports.

⁷ The domestic resource cost measure is calculated as the relationship between the net cost of producing the product utilizing national resources and the net cost in foreign exchange of importing that product. Furthermore, it is a measure of international competitiveness.

In addition, comparative advantage in the production of basic grains can be determined by comparing the DRCs to the exchange rate prevailing during the time of the computations. If the DRC is less than the foreign exchange rate, the country has comparative advantage in the production of this product. If the DRC is greater than the exchange rate, more foreign exchange will be saved by importing the item than by producing it.

Table II-5
Basic Grain Yields, Selected Crops and Countries

Item	: 1986	: 1987	: 1988	: Average	: Index
:	:	:	: -- kg/ha --	:	: (%)
Corn :					
Guatemala	1,772	1,565	1,595	1,644	113
El Salvador	1,678	2,045	2,214	1,979	136
Honduras	1,402	1,560	1,443	1,468	101
Nicaragua	1,499	1,448	1,402	1,450	100
Mexico	1,827	1,705	1,735	1,756	122
United States	7,487	7,497	5,311	6,765	467
:					
Beans :					
Guatemala	698	676	501	625	104
El Salvador	825	391	983	733	122
Honduras	536	544	575	552	92
Nicaragua	713	520	564	599	100
Mexico	596	572	581	583	97
United States	1,717	1,720	1,578	1,672	279
:					
Rice :					
Guatemala	3,195	2,214	2,526	2,645	76
El Salvador	3,902	3,602	4,160	3,888	112
Honduras	2,505	3,558	2,929	2,997	86
Nicaragua	3,933	2,815	3,686	3,478	100
Mexico	3,460	3,813	3,500	3,591	103
United States	6,334	6,227	6,178	6,246	180

Source: FAO.

Table II-6

**DOMESTIC RESOURCE COSTS,
BASIC GRAINS AND EXPORT CROPS
1991**

	<u>Yield</u> (qq/mz)	<u>Cost</u> C\$/qq	<u>Domestic</u> <u>resource</u> <u>cost (%)</u>	<u>Exchange</u> <u>saving/qq</u>
Corn:				
Hand labor	18	35.99	4.45	0.55
With oxen	40	38.64	4.83	0.17
Mechanized	50	41.16	5.38	-0.38
Beans:				
Hand labor	10	78.1	1.56	3.44
With oxen	12	110.55	2.12	2.88
Mechanized	15	80.75	1.02	3.98
Irrigated	20	110.35	1.85	3.15
Rice:				
Hand labor	12	85.75	3.43	1.57
With oxen	24	70.92	2.33	2.67
Irrigated	42	113.86	5.24	-0.24
Sorghum:				
With oxen	36	34.04	4.29	0.71
Mechanized	45	34.63	4.30	0.70
Coffee:				
Semi-technified	12	315.28	3.47	1.53
Technified	22	345.52	3.86	1.14
Cotton	13	369.42	4.89	0.11
Honeydews (crates)	1657	12.17	2.79	2.21
Bananas (crates)	2873	16.67	0.69	4.31

In 1991, the Nicaraguan foreign exchange balance would have been improved by production increases for the basic grains since the DRCs indicated exchange savings from domestic production.

These calculations reflect a very complex pattern of productivity and imported use responses. Bananas has the most favorable DRC, by far. Low input bean production is the next most favorable with a DRC of just over 1.0. DRC coefficients are favorable for each of the traditional export crops, and for honeydews (although only marginally favorable for cotton).

For corn and rice, the ratio is favorable for production using traditional methods, but unfavorable for mechanized production with its higher input requirements implying a very limited potential for expansion of production of those crops.

Because the DRC ratios are high for technified production of corn and rice, increased production of those crops is unlikely to save significant amounts of foreign exchange unless land area under cultivation using traditional methods is expanded or productivity increases sharply. However, the potential for increasing bean production appears to be high since both traditional and technified production methods would appear to earn relatively large amounts of foreign exchange (and to be quite profitable). Sorghum also has a favorable DRC, but the margin is small and sorghum is not now competitive in regional markets.

Cotton has a marginally favorable DRC, but returns little profit. However, the cotton DRC likely underestimates its full foreign exchange impact since oil meals are in short supply in Nicaragua and cottonseed meal offsets imports of other fish and vegetable meals for use in compound animal feeds.

One additional factor that has a major influence on DRCs is domestic yield. Because yield changes influence the DRC directly, relatively small changes have large impacts on productivity (Table II-7). For example, for technified corn a yield of 45qq/mz implies an unfavorable DRC of C\$7/\$, while a 15 percent yield increase would reduce the DRC to a favorable C\$4.9/\$ under otherwise identical conditions.

5. Competitiveness

Several important elements of competitiveness are summarized in Table II-7. In general, the most basic competitiveness measure is whether producer returns are positive, and whether there is a positive incentive for producers to maintain or expand production. This measure is relatively straightforward and direct, the comparison between production costs and domestic prices.

The second measure is whether commodities are competitive in international markets, basically a comparison between domestic and international prices (adjusted to a common border point). This comparison is reflected in the nominal protection

Table II-7

**YIELD INCREASES REQUIRED TO BE COMPETITIVE
SELECTED COMMODITIES AND PRODUCTION PRACTICES**

	Yield (qq/mz)	Cost C\$/qq	Protection Rates		Price Managua (C\$/qq)	Domestic* Market Advantage		World Market Advantage	
			Nominal	Effective		(qq/mz)	(%)	(qq/mz)	(%)
CORN:									
Hand Labor	18	35.99	1.01	1.01	40.00	1	6	-1	-6
With Oxen	40	38.64	1.01	1.02	40.00	-1	-2	-2	-6
Mechanized	50	41.16	1.00	1.00	40.00	-4	-8	-3	-5
BEANS:									
Hand Labor	10	78.1	0.59	0.57	110.00	3	34	4	36
With Oxen	12	110.55	0.59	0.50	110.00	-1	-5	4	36
Mechanized	15	80.75	0.59	0.50	110.00	4	29	5	36
Irrigated	20	110.35	0.59	0.50	110.00	-1	5	7	36
RICE:									
Hand Labor	12	85.75	0.93	0.93	105.00	2	16	0	2
With Oxen	24	70.92	0.94	0.94	105.00	10	41	0	1
Irrigated	42	113.88	0.94	0.91	105.00	-5	-12	0	1
SORGHUM:									
With Oxen	36	34.04	1.10	1.16	40.00	4	12	-5	-15
Mechanized	45	34.63	1.08	1.11	40.00	4	10	-6	-13

* Domestic and world market advantage reflects the yield change required to make production costs 5% below domestic and world prices. Where costs are above prices, the advantage is negative.

rate. The third comparison is the DRC ratio, the value of domestic resources required to produce or save each unit of foreign exchange.

The foregoing analysis describes Nicaraguan agricultural commodities in terms of these measures. Table II-7 summarizes for each basic grain the cost advantage in domestic and world markets, that is the difference (or ratio) between production costs and per unit returns in domestic and international markets. These are indicated in terms of yields required to provide a 5 percent advantage in each market, and for those markets where commodities are not now competitive, indicate the yield improvement required to permit them to compete.

Similar comparisons are not presented for export crops, since prices of these commodities are determined in export markets. For these products, the meaningful comparisons are the net returns to producers and the DRC's indicated above.

Each of the basic grains is profitable in domestic markets when produced by traditional methods. For corn, the advantage is 6 percent of domestic prices, but for beans it is a very large 34 percent. For rice and sorghum, the range is in between (12 percent for sorghum, 16 percent for rice). However for mechanized production modes, the advantage declines for each of the commodities except mechanized sorghum, which has as great an advantage as does that produced by hand.

However, only beans have ready access to world markets with current domestic price structures. Domestic corn prices are greater than world prices for all production methods (since the nominal protection rate is greater than unity), as they are for sorghum. Rice prices slightly below levels, but bean prices appear to be quite competitive on world markets at the present time.

E. IMPLICATIONS

1. For Domestic Food Supply

The stagnant basic grains sector implies very serious problems for the primary Nicaraguan food supply during the 1990s, and the foregoing review of policies and production incentives imply only very limited sector growth during the next few years. Production and consumption projections under **current** policies suggest expansion in production of beans and sorghum, while corn and rice output declines moderately during 1992-2000.

The implications of such trends for food availability are extremely serious. For example, per capita consumption of corn was 130 pounds/year in 1980 a level that increased to 161 pounds by 1985 before declining slightly below the 1980 level to 129 pounds in 1990. However, flat production trends during the balance of the decade would mean a decline in per capita corn consumption from 127 pounds in 1991 to

just over 82 pounds by 2000 depending on assumptions concerning donations. Similarly, rice consumption per person could decline from 51 pounds per person in 1991 to just over 21 pounds in 2000.

The outlook for sorghum and beans is little brighter, the results of some expected production growth. Sorghum food use is projected to decline from 37 pounds in 1991 to just under 31 pounds in 2000, while consumption of beans keeps pace with population. Consumption of the four basic grains that was 307 pounds per person in 1985 and 257 pounds in 1990 could decline to 165 pounds by 2000, a one-third drop in per person availability between 1990 and 2000. (Table II-8)

More cohesive and stable agricultural policies would be expected to stimulate production slightly, and reduce pressure on the food supply. Such policies would:

- Provide producers access to credit on the basis of expected productivity, rather than on the basis of central allocations as is done at present;
- End export restrictions so that producers could sell in local international markets when it is profitable to do so;
- End import restrictions and GON interventions in import markets so that producers could purchase production inputs at world prices (plus nominal duties);
- Provide research, development and technical assistance to help producers improve productivity and compete in local and international markets;
- End GON intervention in local markets through marketing and other parastatals; help develop local infrastructure so as to narrow producers' marketing margins and help agricultural subsectors become more responsive to changes in national and international supplies and demand;

The less intrusive and more supportive basic grains policies would be expected to stimulate production slightly, except for sorghum and bean output which likely would increase significantly. Because of their increasing profitability, production of these commodities would be expected to grow significantly so that production per person would increase. (Table II-9)

Less intrusive GON policies are projected to increase basic grain food consumption in two ways. They increase production incentives and production, both through increased area and higher yields (the result of increased investment in technical assistance and infrastructure), and they increase dependence on grain imports.

Table II-8

BASIC GRAINS PRODUCTION AND CONSUMPTION, ORIGINAL POLICIES

	Area (000 ha)	Yield (mt/ha)	Production (tmt)	Consumption		Population (mll)	Per Capita Consumption	
				Human (tmt)	Animal (tmt)		Human (per capita)	Animal (per capita)
CORN								
1980	161	1.12	181	163	6	2.77	130	5
1985	132	1.46	192	239	8	3.27	161	5
1990	193	1.22	236	223	10	3.81	129	6
1991	182	1.35	246	226	10	3.92	127	6
1992	182	1.35	246	182	11	4.04	99	6
2000	182	1.51	275	197	15	5.16	84	6
ROG '80-'90	1.80	0.86	2.67	3.19	4.90	3.24	-0.05	1.61
ROG '92-'00	0.01	1.41	1.42	0.94	3.85	2.79	-4.06	0.73
SORGHUM								
1980	48	1.82	88	30	30	2.77	24	24
1985	75	2.03	152	52	52	3.27	35	35
1990	45	1.87	84	65	28	3.81	37	16
1991	46	1.38	63	60	16	3.92	34	9
1992	48	1.43	69	62	17	4.04	34	9
2000	58	1.63	95	72	25	5.16	31	11
ROG '80-'90	-0.78	0.27	-0.50	7.83	-0.63	3.24	4.44	-3.75
ROG '92-'00	2.03	1.47	3.53	1.68	4.24	2.79	-0.92	1.73
BEANS								
1980	54	0.52	28	37	0	2.77	29	0
1985	72	0.63	46	50	0	3.27	34	0
1990	108	0.51	55	48	0	3.81	28	0
1991	123	0.53	65	50	0	3.92	28	0
1992	128	0.56	72	52	0	4.04	28	0
2000	172	0.82	141	66	0	5.16	28	0
ROG '80-'90	7.13	-0.24	6.83	2.64	0.00	3.24	-0.58	-
ROG '92-'00	3.76	4.88	8.83	3.21	0.00	2.79	0.14	-
RICE								
1980	32	1.93	62	119	0	2.77	95	0
1985	35	2.27	80	114	0	3.27	77	0
1990	37	1.91	72	109	0	3.81	63	0
1991	35	1.79	62	91	0	3.92	51	0
1992	35	1.81	64	83	0	4.04	45	0
2000	21	1.64	34	56	0	5.16	24	0
ROG '80-'90	1.50	-0.11	1.38	-0.85	0.00	3.24	-3.96	-
ROG '92-'00	-6.42	-1.23	-7.57	-4.93	0.00	2.79	-7.36	-
TOTAL BASIC GRAINS								
1980	296	1.21	360	349	36	2.77	278	29
1985	314	1.50	470	456	59	3.27	307	40
1990	383	1.16	446	445	38	3.81	257	22
1991	386	1.13	436	426	26	3.92	240	15
1992	394	1.14	450	379	28	4.04	207	15
2000	433	1.26	545	390	40	5.16	167	17
ROG '80-'90	2.60	-0.42	2.17	2.45	0.52	3.24	-0.76	-2.64
ROG '92-'00	1.19	1.19	2.40	0.37	4.43	2.79	-3.56	1.35

Table II-9

BASIC GRAINS PRODUCTION AND CONSUMPTION, ALTERNATIVE POLICIES

	Area (000 ha)	Yield (mt/ha)	Production (tmt)	Consumption		Population (mil)	Per Capita Consumption	
				Human (tmt)	Animal (tmt)		Human (per capita)	Animal (per capita)
CORN								
1980	161	1.12	181	163	6	2.77	130	5
1985	132	1.46	192	239	8	3.27	161	5
1990	193	1.22	236	223	10	3.81	129	6
1991	182	1.35	246	226	10	3.92	127	6
1992	185	1.48	274	204	11	4.04	111	6
2000	199	1.99	396	362	15	5.16	155	6
ROG '80-'90	1.80	0.86	2.67	3.19	4.90	3.24	-0.05	1.61
ROG '92-'00	0.87	3.81	4.72	7.46	3.85	2.79	1.99	0.73
SORGHUM								
1980	48	1.82	88	30	30	2.77	24	24
1985	75	2.03	152	52	52	3.27	35	35
1990	45	1.87	84	65	28	3.81	37	16
1991	46	1.38	63	60	16	3.92	34	9
1992	55	1.44	79	66	20	4.04	36	11
2000	91	1.67	151	88	50	5.16	38	21
ROG '80-'90	-0.78	0.27	-0.50	7.83	-0.63	3.24	4.44	-3.75
ROG '92-'00	5.72	1.65	7.46	3.32	10.53	2.79	1.09	9.03
BEANS								
1980	54	0.52	28	37	0	2.77	29	0
1985	72	0.63	46	50	0	3.27	34	0
1990	108	0.51	55	48	0	3.81	28	0
1991	123	0.53	65	50	0	3.92	28	0
1992	139	0.62	86	60	0	4.04	33	0
2000	203	0.97	197	99	0	5.16	43	0
ROG '80-'90	7.13	-0.24	6.83	2.64	0.00	3.24	-0.58	-
ROG '92-'00	4.85	5.80	10.93	6.55	0.00	2.79	4.22	-
RICE								
1980	32	1.93	62	119	0	2.77	95	0
1985	35	2.27	80	114	0	3.27	77	0
1990	37	1.91	72	109	0	3.81	63	0
1991	35	1.79	62	91	0	3.92	51	0
1992	32	1.80	58	77	0	4.04	42	0
2000	24	1.85	44	99	0	5.16	42	0
ROG '80-'90	1.50	-0.11	1.38	-0.85	0.00	3.24	-3.96	-
ROG '92-'00	-3.78	-0.33	-3.47	3.19	0.00	2.79	-1.89	-
TOTAL BASIC GRAINS								
1980	296	1.21	360	349	36	2.77	278	29
1985	314	1.50	470	456	59	3.27	307	40
1990	383	1.16	446	445	38	3.81	257	22
1991	386	1.13	436	427	26	3.92	240	15
1992	412	1.21	497	406	31	4.04	222	15
2000	516	1.53	788	649	65	5.16	277	17
ROG '80-'90	2.60	-0.42	2.17	2.45	0.52	3.24	-0.76	-2.64
ROG '92-'00	2.87	2.97	5.93	6.03	9.56	2.79	1.44	1.35

The comparisons between sector performance under current and alternative policies are quite dramatic because they imply a fundamental change; from a stagnant or declining sector at the end of the decade, to a sector with moderate growth and reorganization. For example, given projected rates of population growth and basic grain production growth under current policies, grain availability per person would be about 167 pounds by 2000, more than 100 pounds below the 278 pound level of 1980 and 90 pounds below the 1990 level. Thus, the improved levels observed under alternative policies seem especially favorable in comparisons with the downward trends projected in the absence of policy reform.

Domestic production of each of the basic grains is increased significantly under the alternative policies. However, much of the increase in food availability is the result of increased commercial imports. The alternative policy projects that a moderate duty will be imposed, but that basic grain imports will otherwise be unrestricted. As a result, they are projected to increase from zero in 1990 to 171,000 tons by 2000. Part of the foreign exchange for these purchases is projected to come from increased basic grain exports (primarily beans), but most is likely to come from traditional export crops which are much more efficient in their use of domestic resources than are basic grains.

For the four basic grains, more cohesive policies would be expected to imply production increases of 5.9 percent annually during 1992-2000 (rather than 2.4 percent as under current policy). Food consumption could increase from 240 pounds in 1991 to 277 pounds per person by 2000 and feed grains availability could increase from 15 pounds per person in 1991 to more than 28 pounds by 2000.

F. OVERALL IMPLICATIONS

The foregoing review of the current agricultural situation in Nicaragua holds a number of serious implications for GON policy.

The first is that imports of basic grains likely will be required in the future to feed the urban population. Under current policies, availability of basic grains per capita likely will decline sharply during 1991-2000 in the absence of growing exports. Declines in per capita availability of basic foods are well established. Even with more coherent and supportive policies, future availability will fall relative to current levels in the absence of imports. To avoid the social consequences of a declining food supply, commercial imports likely will be required. By 2000, under current policies, an additional 133,000 tons of basic grains will be required to hold per capita availability at the 1990 level, about \$20 million worth of grain annually at \$150 per ton. A key question for GON is whether to invoke extraordinary measures to produce this grain domestically, or to depend on commercial imports.

Since the traditional export crops are far more efficient earners of foreign exchange than are the basic grains (reflected by much lower DRC's), it is more economical for

Nicaragua to encourage additional production of coffee, bananas and beef, for example, to pay for imports of corn, rice or other grains than to produce the commodities directly, especially using mechanized production. As indicated above, it is efficient for Nicaragua to encourage increased productivity throughout the basic grains sectors, and to expand production of basic grains to the extent that is possible using traditional methods. However, except for sorghum and beans, the DRCs indicate that it is relatively less efficient to expand mechanized basic grain production than to import grains to meet Nicaraguan needs. This is true for a number of reasons.

Nicaragua has invested large amounts of capital in the development of production capital in the coffee, banana and beef subsectors and can expand those sectors relatively easily and efficiently using primarily domestic resources; more easily than it can the production of non-traditional crops, for example. And, in spite of stiff competition for coffee, banana and beef markets are less saturated and have greater growth potential than do cotton, corn, sorghum, rice or sugar markets at the present time.

Also, several of the traditional (and wealthy) exporting countries subsidize production and exports of corn, rice, sorghum and other food grains. As a result, these and similar products (including wheat flour) are available on world markets in most years at prices that Nicaragua cannot match. Until Nicaraguan productivity increases to the point that food supplies are not critical, it makes sense politically to buy products at subsidized world prices and produce those products which are traded on relatively free markets (including coffee and beef).

To fully appreciate the implications of the current economic situation in Nicaragua requires judgements regarding changes in production and productivity that may occur in the future. Given the risks inherent in such judgements, the following observations are offered:

- Poultry. The GON appears to have implicitly decided to expand domestic poultry production to provide high quality protein products for domestic production and as a conscious strategy to make beef consumption less attractive so as to free beef exports. This market intervention has several important implications.

Poultry production on the scale feasible in Nicaragua requires imports of several important inputs, including veterinary biologics, high quality, genetically improved day-old chicks (or fertilized eggs) and specialty feed stuffs (especially, high protein meals). Thus, even though the local industry appears to be relatively efficient, it will be difficult for it to compete with imported finished poultry products if the local industry's costs are inflated by policies that restrict access to high quality, low cost imports.

At the current time, import costs are increased by policies that require licenses and other regulations. These restrictions are partly offset by the overvalued cordoba which reduces effective cost of imports and increase potential costs of competing finished poultry products. Future growth of the domestic poultry industry depends on future growth of disposable income and the demand for food; availability of an adequate supply of local of imported feedstuffs; and, access to high quality genetic materials and medicinals, as well as carefully balanced domestic trade and investment policies.

- Investment in agricultural production is an enormous problem in Nicaragua- , the result of a large number of factors. These include weak markets, high costs and low productivity growth, lack of capital and the central allocating procedure for credit and lack of access to foreign markets for inputs, and for products. Because investment is such an important problem, the tendency is for the GON to ration capital in an effort to allocate it equitably. Instead, the approach should be to allocate it on the basis of potential return to each investment so that efficiency and earnings are maximized.
- Cotton production appears to be afflicted by more serious problems than the other commodities. Falling productivity appears to have reduced investment in the sector, a trend that has accelerated the basic productivity decline (in particular, producers are having enormous difficulty dealing with damaging pests without both high production costs and corollary environmentally damage).

Also, production in many of the world's large cotton exporters has grown rapidly in recent years, faster than have world markets. The result is current pressure on world prices and potential continued strong competition for markets in the future. Thus, the combination of increasing competition and declining world market prices seriously weakens the investment outlook for this commodity.

At the same time, this outlook raises serious questions regarding potential uses for land now in cotton, and regarding alternative supplies of high protein meal and oil now produced from cottonseed. To date, the National Cotton Commission has invested considerable effort in developing techniques to deal with pests that are reducing cotton productivity. While these efforts are badly needed, questions of alternative uses for cotton resources also are of high priority.

- Marketing costs. Because of past GON interventions in agricultural production and distribution, the important role of parastatals and the general decapitalization of the sector, the agricultural marketing infrastruc-

ture is highly disorganized and very inefficient. As a result, marketing costs are high, and the sector transmits price and investment signals from market to producer very indirectly. The result is diminished returns to producers, increased instability throughout the sector and sharply restricted investment in both production and marketing.

Investments in market infrastructure are provided by governments in developed countries worldwide and are extremely important in agricultural and agribusiness development.

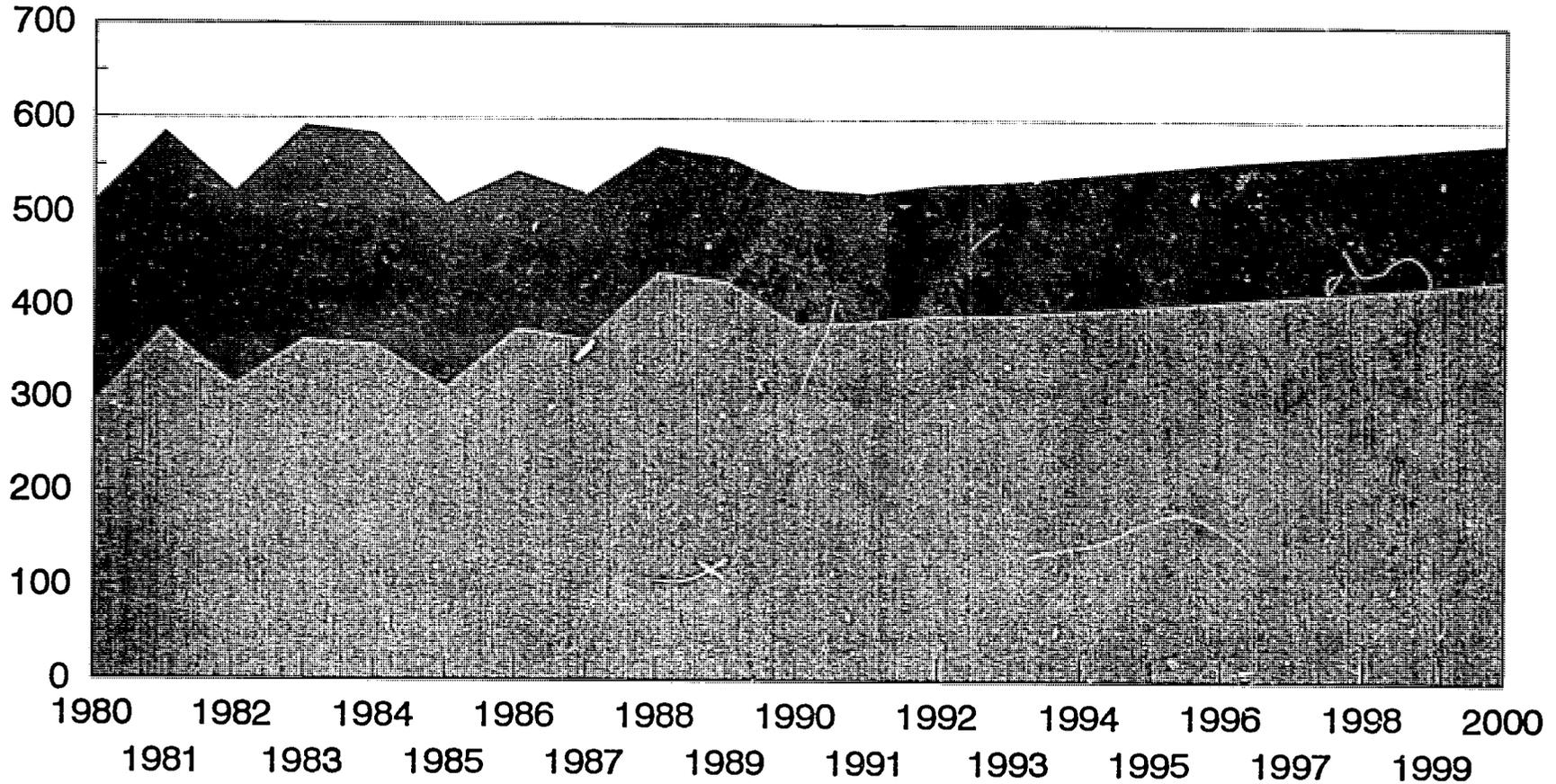
Because Nicaraguan markets are small, the competition from large numbers of well informed bidders for agricultural products necessary to insure low cost marketing may not be possible relying only on domestic channels. However, opening domestic markets to international competitors can make those markets much more dynamic. At the same time, moderate, uniformly applied tariffs can provide much of the protection from wide swings in world prices now provided by non-tariff barriers and trade restrictions. The result likely would be a much more vigorous agricultural sector, increasingly responsive to both domestic and international shifts in supply and demand.

- Beans and sorghum. These commodities are current bright spots in the basic grains outlook, but much of the outlook depends on which production technologies can be improved the most. Bean production includes a number of types and varieties, and market preferences are strong. Genetic potential also appears to be strongly related to individual varieties, both in terms of production potential and disease resistance. The GON must use these and other factors to allocate scarce funds for research, testing, technology transfer and technical assistance among competing crops and uses.

Each of the commodities that have an apparent comparative advantage in earning major amounts of foreign exchange (or avoiding foreign exchange outlaws) have very large needs for investment in productivity growth. This includes, especially, coffee production, forage improvement for cattle production, and bean and sorghum production. Because the lead time required on the basis of current judgements regarding production and market potential. While GON policy should be to make most resources available and require annual competition among production alternatives on the basis of expected short run returns, investment in both market infrastructure and industry research, development and technical assistance will need to be made on the basis of central GON evaluations of market and production potential and intermediate and long-term national development strategies.

Projected Total Production Under Current Policy

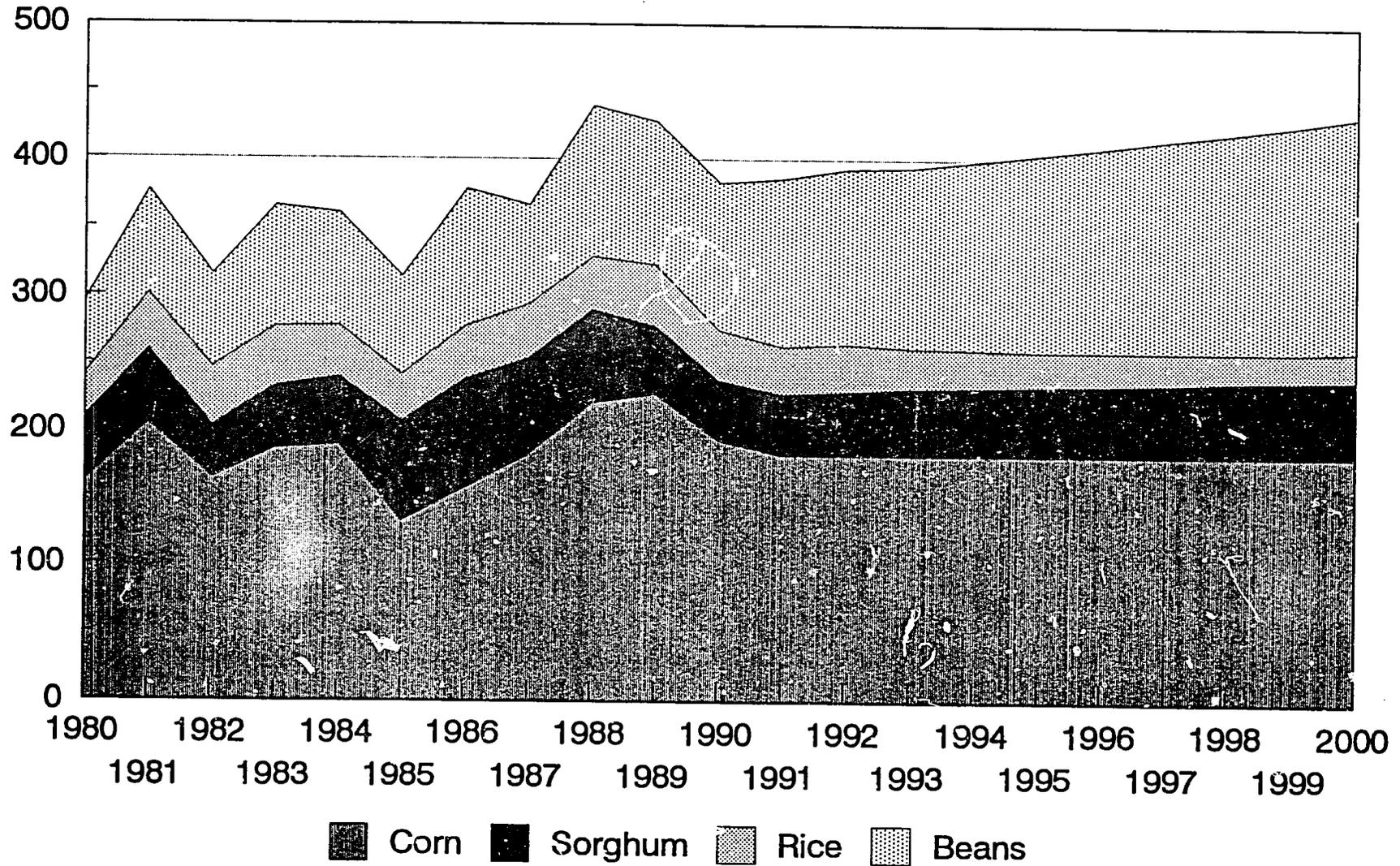
(TMT)



Basic Grains Export Crops

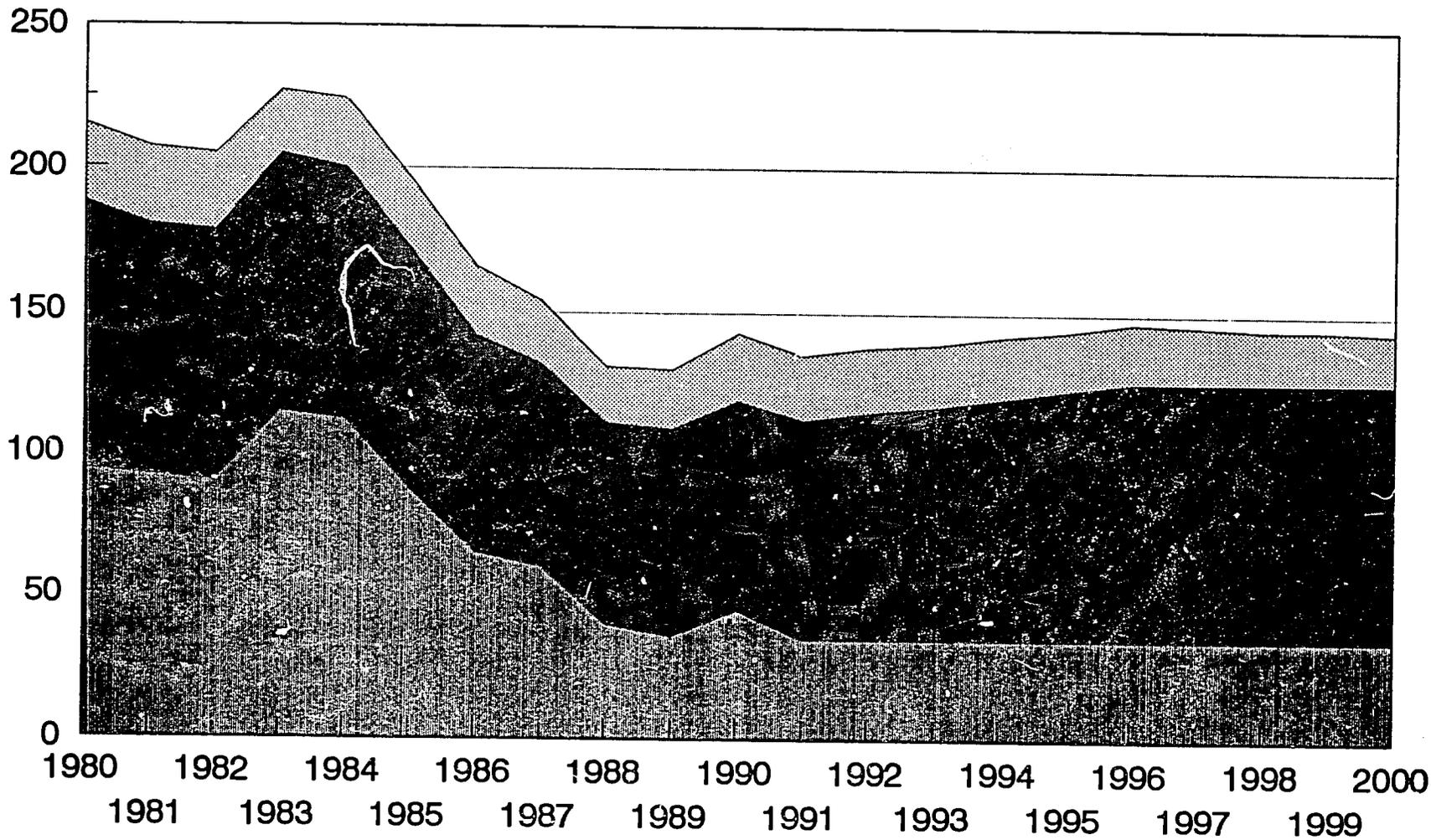
Projected Grain Area Under Current Policy

('000 Ha)



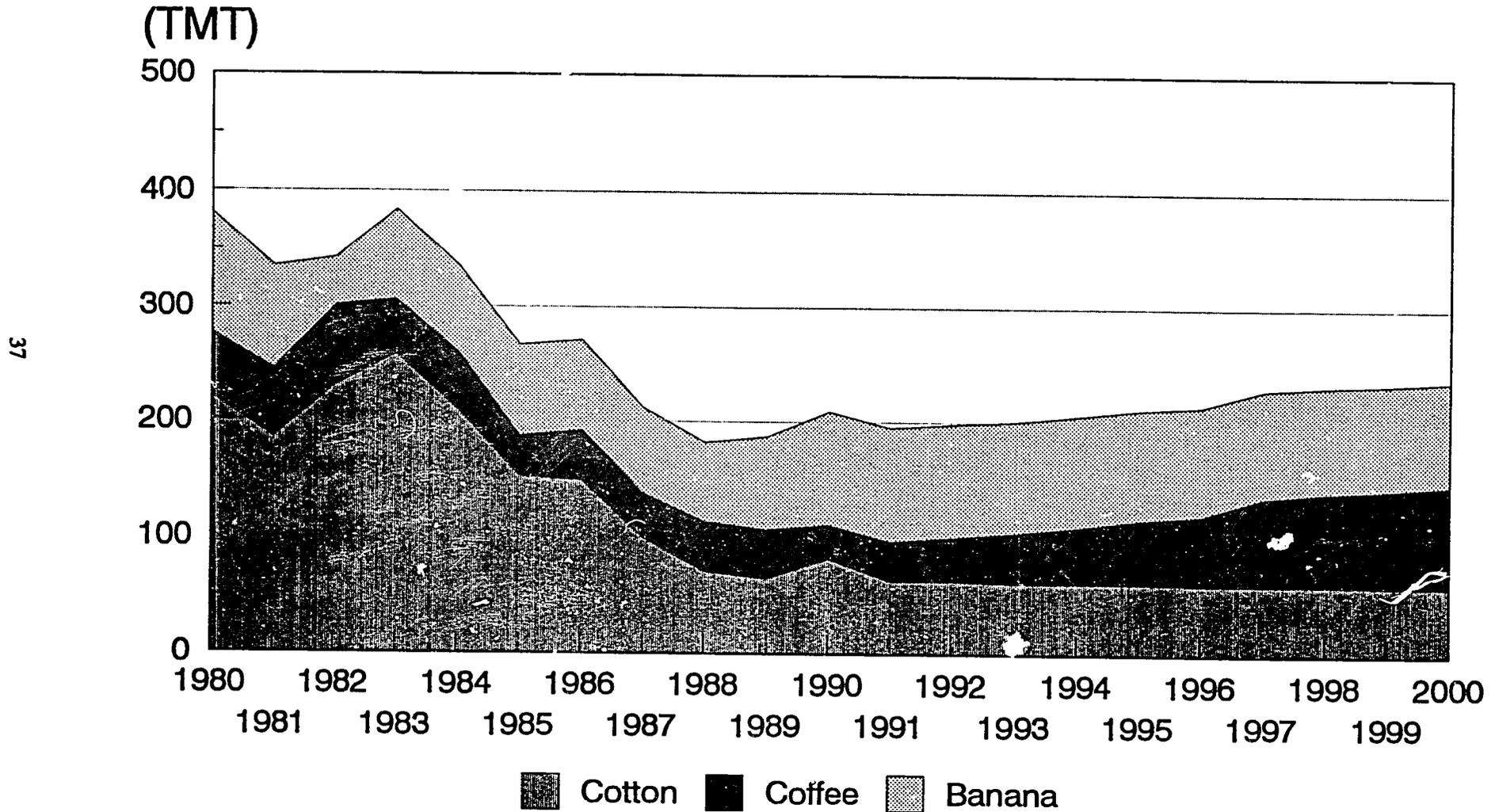
Projected Export Crop Area Under Current Policy

('000 Ha)



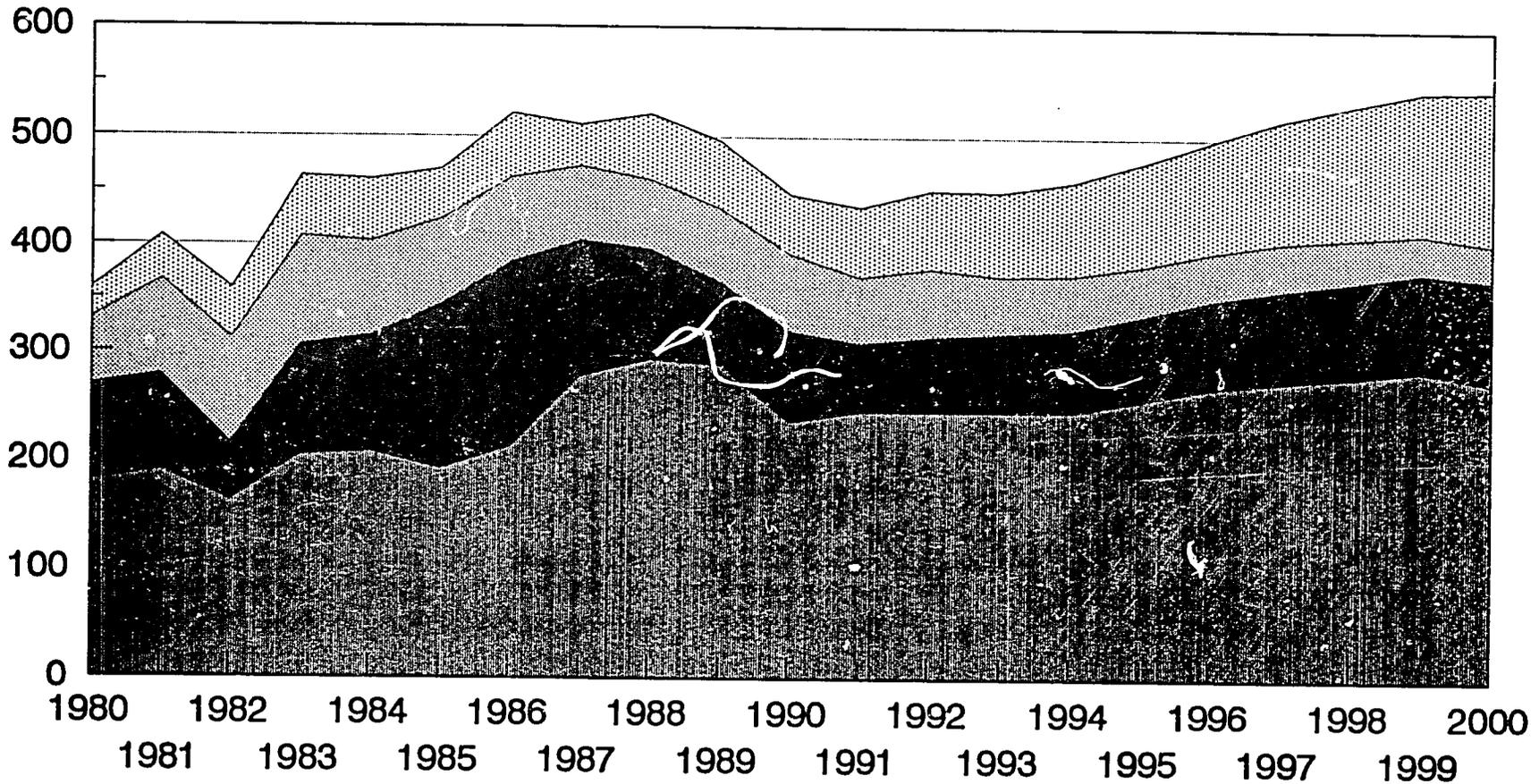
■ Cotton ■ Coffee ■ Banana

Projected Export Crop Production Under Current Policy



Project Basic Grain Production Under Current Policy

(TMT)

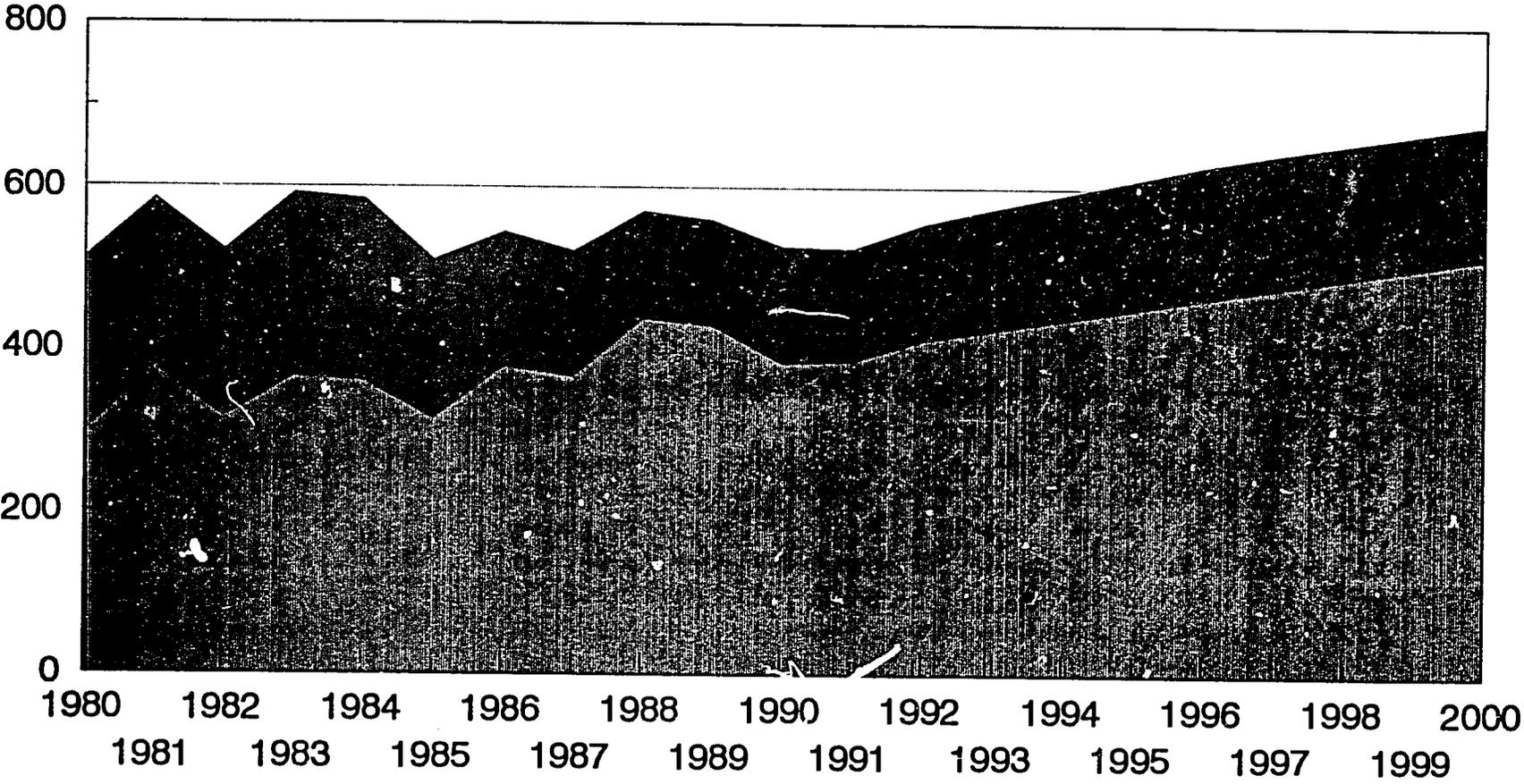


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■ Corn ■ Sorghum ■ Rice ■ Beans

Projected Total Production Under Alternative Policy

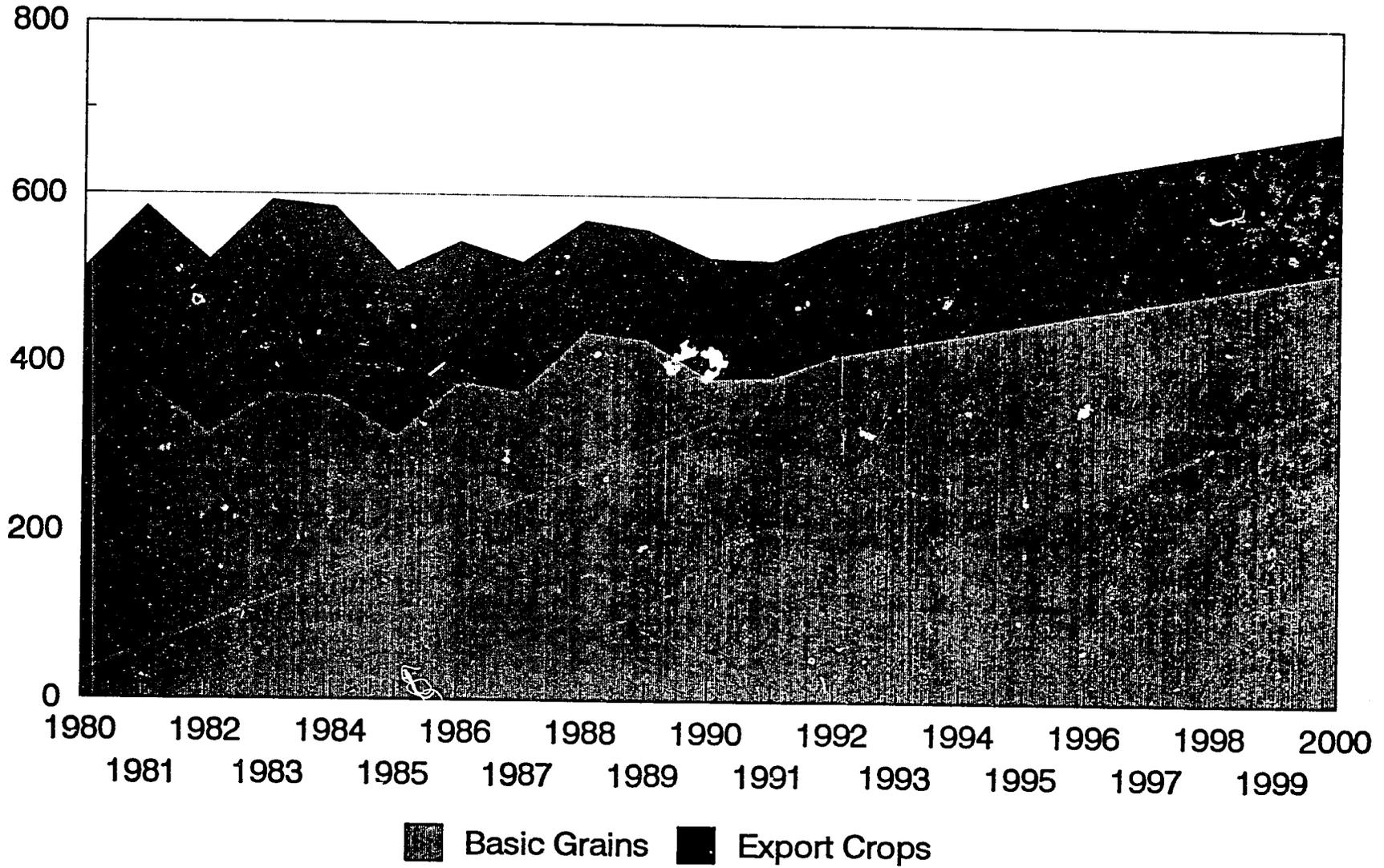
(TMT)



Basic Grains Export Crops

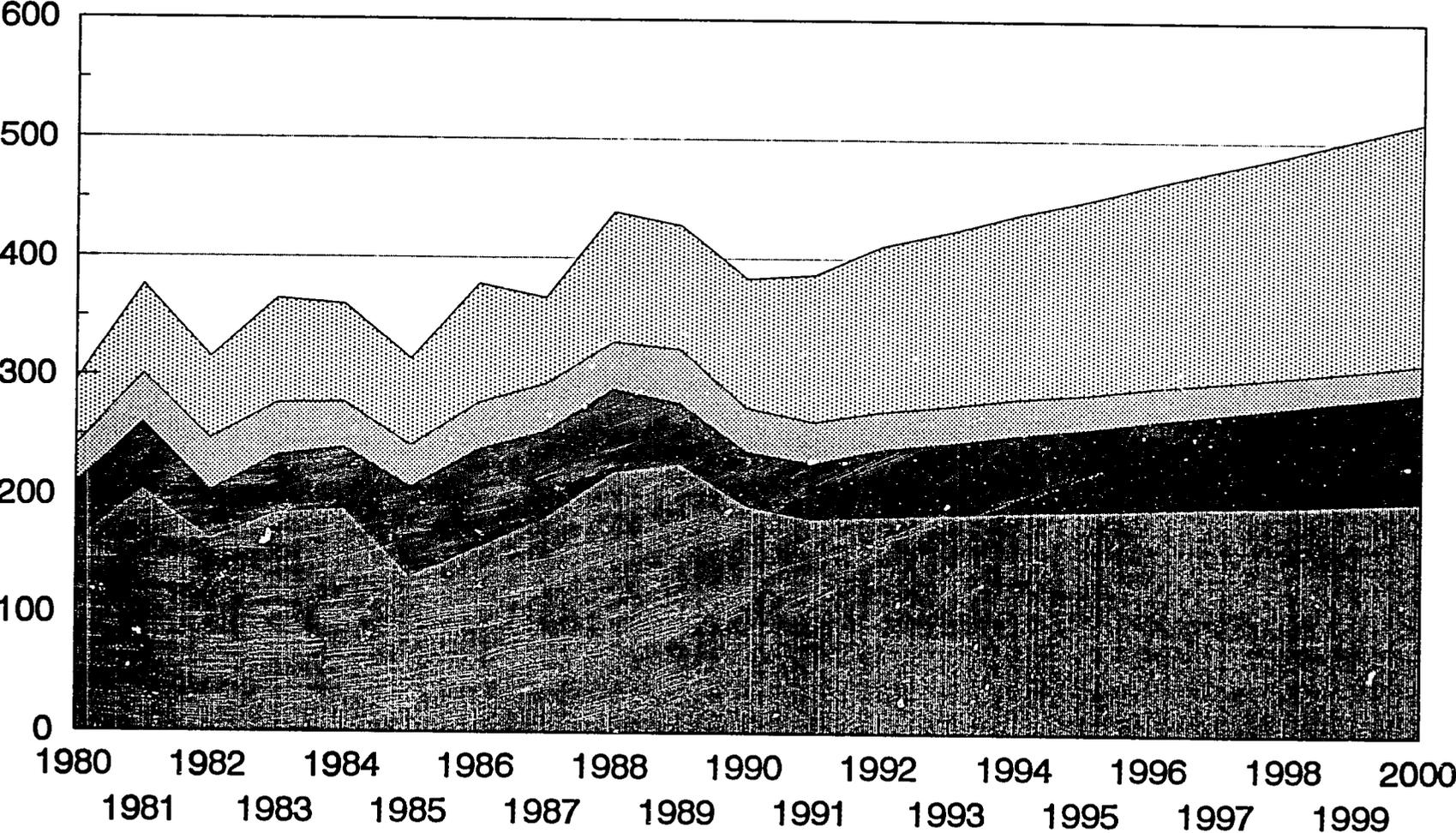
Projected Total Area Under Alternative Policy

('000 Ha)



Projected Grain Area Under Alternate Policy

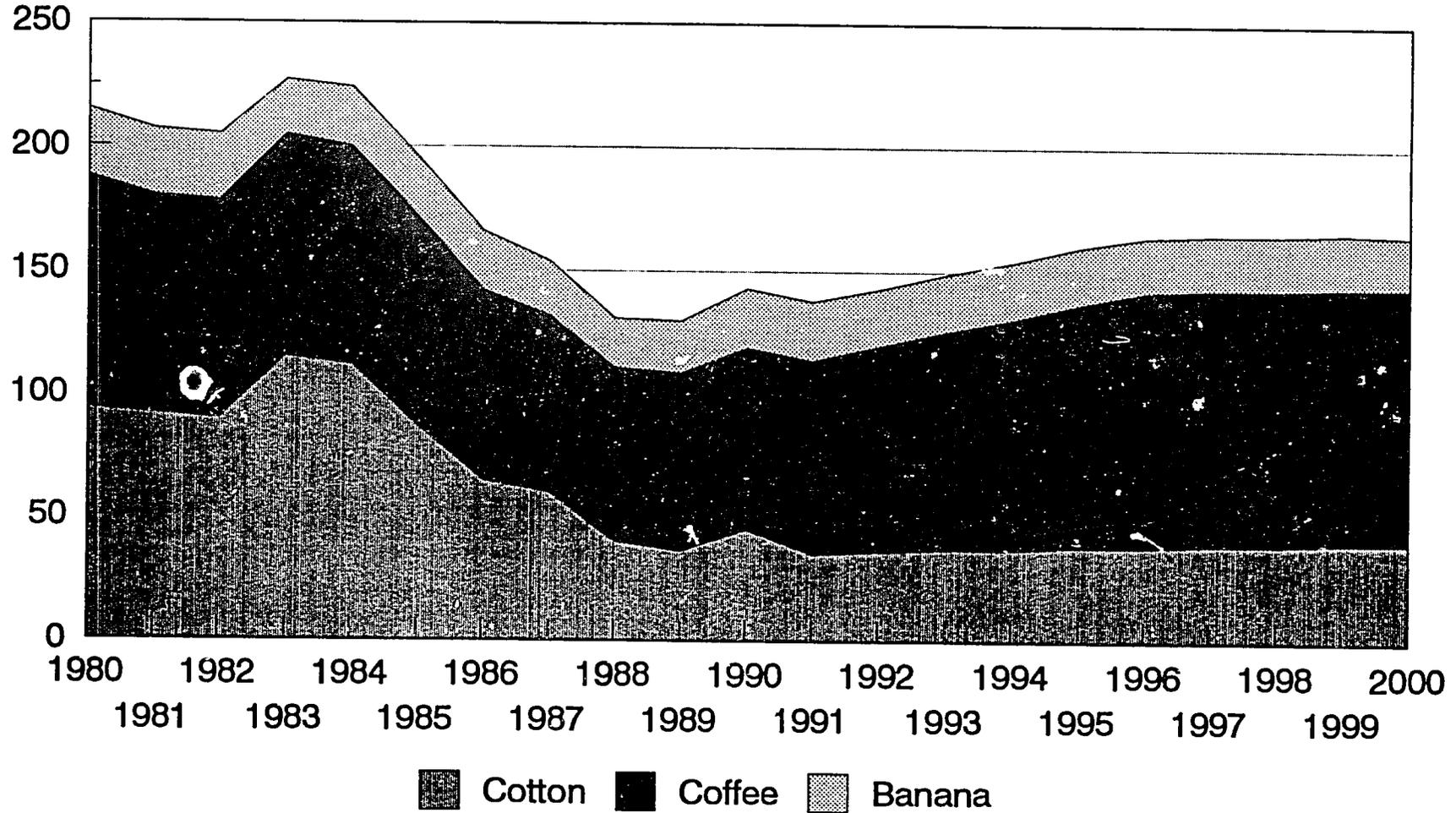
('000 Ha)



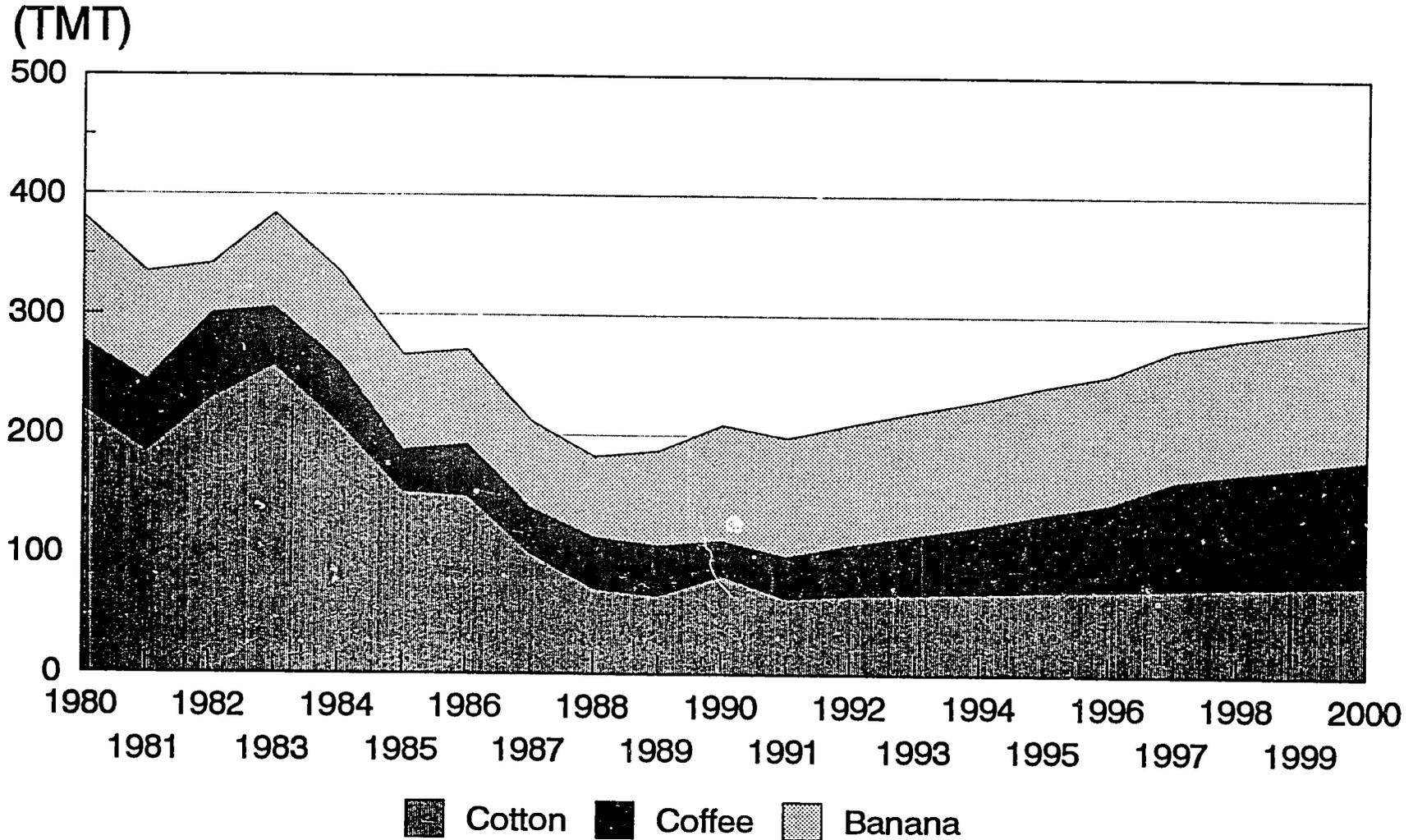
■ Corn ■ Sorghum ■ Rice ■ Beans

Projected Export Crop Area Under Alternative Policy

('000 Ha)

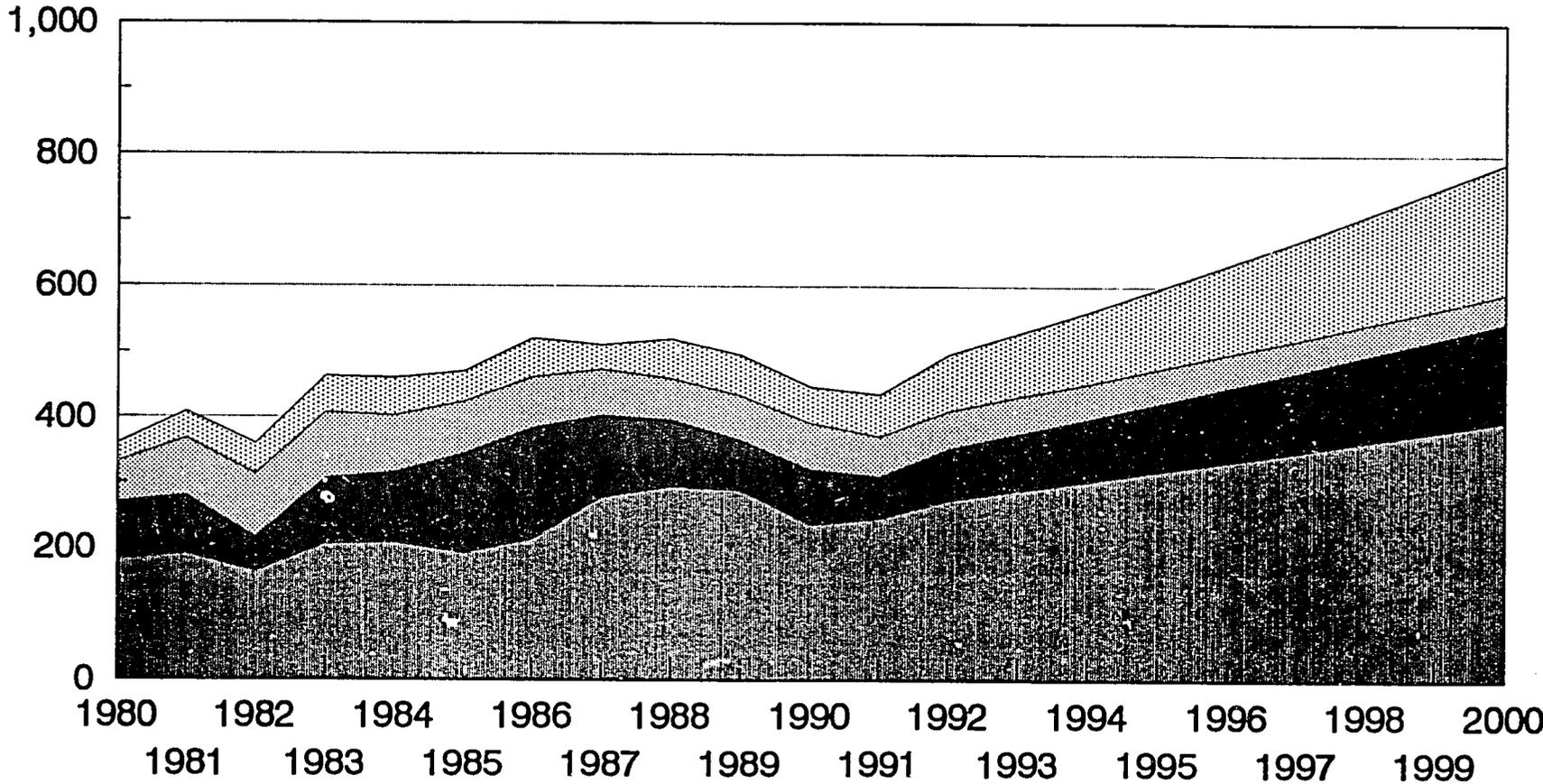


Projected Export Crop Production Under Alternative Policy



Projected Basic Grain Production Under Alternative Policy

(TMT)



Corn
 Sorghum
 Rice
 Beans

III. THE STRUCTURE OF AGRIBUSINESS SYSTEMS IN NICARAGUA

COMMODITIES PRIMARILY FOR EXPORT

A. COFFEE

B. COTTON

C. BANANAS

D. MELONS / NON-TRADITIONALS

COMMODITIES PRIMARILY FOR DOMESTIC CONSUMPTION

BASIC GRAINS

E. CORN

F. BEANS

G. RICE

H. SORGHUM

I. POULTRY

A. COFFEE SYSTEM

1. World Markets

Overall situation

The relative stagnation of demand for coffee, combined with continued growth in production and exports by foreign exchange-starved developing nations, has led to a structure of chronic oversupply. While the quotas established by the International Coffee Organization (ICO) were able to maintain relative stability of prices during most of the 1980's, the structural imbalance and increasing dissatisfaction with the quota system among importers (and selected exporters), led to the failure of the ICO to establish new quotas in July of 1989. Coffee prices plummeted from \$1.10 per pound in July 1989 to \$0.70 in October, and have since drifted at an average price of about \$0.80.

Without the quota system, a new era of liberalized trade is emerging for coffee, with important implications for both consumers and producers. Quality and cost competitiveness will become increasingly important as success factors for exporters (as opposed to historical market shares artificially maintained by quotas). Some of the principal dynamics shaping the world coffee markets, and their implications for Nicaragua, are further outlined below.

Supply/exports

Total world production increased about 14 percent from a 1979-81 average of 5.28 million metric tons to 6.01 million in 1990. Exports of green and roasted coffee reached 4.62 million tons in 1989, for a value of \$9.66 billion. (See Table III-1) Export volume in 1989 was up 9 percent over 1988 and represented the highest level of the decade. In contrast, the value of exports declined 8 percent in 1989 to the lowest level since 1983.

Production has increased as developing countries have desperately sought to increase foreign exchange earnings. At the grower level, yields increased by 10 percent between 1981 and 1987 due to improved varieties and a trend towards planting more trees per hectare. Smaller scale growers, seeing their incomes eroded by declining prices, exchange rate policies and inflation, have been forced to produce as much as possible for survival. Given the high fixed investment in coffee trees, switching to other crops is not easy for marginal producers, especially those in locations not suited for other commodities.

COFFEE PRODUCTION & YIELDS

	<u>PRODUCTION (000 tons)</u>							<u>YIELDS (Kg./Ha.)</u>	
	<u>1979-81</u>	<u>1985</u>	<u>1986</u>	<u>1987</u>	<u>1988</u>	<u>1989</u>	<u>1990</u>	<u>1979-81</u>	<u>1987</u>
World	5,280	5,940	5,133	6,145	5,684	6,035	6,013	513	565
Brazil	1,475	1,911	977	2,112	1,369	1,532	1,441	589	812
Colombia	740	676	708	654	709	644	801	700	659
Costa Rica	106	155	128	138	145	147	172	1,279	1,255
Ecuador	82	121	118	118	144	128	134	284	340
El Salvador	183	119	139	141	120	97	165	1,020	881
Guatemala	167	162	159	159	190	220	210	661	612
Honduras	71	75	76	70	91	90	104	588	556
Mexico	228	308	375	315	300	326	309	507	759
Nicaragua	59	50	43	41	43	44	51	623	538
Peru	90	91	97	97	99	106	101	671	683
Other Latin America	245	264	266	254	276	269	251	N/A	N/A
Sub-Total Americas	3,446	3,932	3,086	4,099	3,486	3,603	3,739	6,922	7,095
Ivory Coast	298	277	265	260	187	239	219	287	224
Ethiopia	192	170	181	178	170	200	195	273	239
Kenya	89	94	116	109	125	104	90	790	790
Uganda	112	210	195	205	156	174	168	500	872
Zaire	74	92	95	102	105	103	98	311	356
Other Africa	408	389	433	440	469	424	444	N/A	N/A
Sub-Total Africa	1,173	1,232	1,287	1,294	1,212	1,244	1,214	2,161	2,481
Indonesia	295	314	358	330	405	411	391	602	545
Other Asia	314	414	353	369	519	707	603	N/A	N/A
Sub-Total Asia	609	728	711	699	924	1,118	994	602	545

Source: FAO

The principal exporter in 1989 was Brazil, with a 20.4 percent share of the world market volume and 16.7 percent of its value. This represents a loss of market share from 1985 when it stood at 23.3 percent and 20.7 percent respectively. Colombia had market shares of 13.6 in volume and 15.7 percent in value in 1989, compared to 13.2 and 15.2 in 1985. These trends, together with changes in demand further described below, suggest that Colombia is on its way towards becoming the most important exporting country. Other key exporters include Indonesia, Mexico, Guatemala, Ivory Coast, Costa Rica, Kenya, Ethiopia and Uganda. (Table III-2 and Graph III-1)

The three principal varieties of coffee are: mild washed arabicas (generally referred to as other milds), primarily produced in Colombia and Central America; unwashed arabicas, mostly from Brazil, and robustas from Africa, Indonesia and Brazil. The market share for the Mexico-Central America-Colombia region, which produces mostly washed milds, remained virtually unchanged between 1985 and 1989 at 30.8 percent in volume and 34 percent in value. Africa's share decreased very slightly to 21 percent in volume and 19.7 percent in value in 1989. Despite growing demand for milds (see below), the relative stability in market shares can be attributed to the quota system and sharp declines in a few milds producing countries such as El Salvador.

Consumption/Imports

Total world imports in 1987 amounted to 4.55 million metric tons, increasing to 4.67 million in 1989. (See Table III-3)

The U.S. represents the principal single country market with 25 percent and 22 percent of the volume and value respectively, of world imports in 1989. However, the total European market accounts for 55 percent of the volume and 59 percent of the value of world imports. Germany is the leading importer with 16 percent and 18 percent shares. Over the past few years, U.S. imports have been stagnant while European imports continue to increase (in terms of volume). Japan's imports represent 6 percent of world volume and 7 percent of value.

Per capita consumption of coffee has been declining in the U.S. In 1962, consumption peaked at 3.12 cups per day, but declined to about 1.75 by 1989. While coffee continues to dominate the hot beverage market (about 80 percent), it has lost market share primarily to soft drinks. The decline may have bottomed out since recent surveys indicate that slightly more Americans are drinking coffee than a few years ago. Although consumption is relatively price inelastic, the 1989 price decrease is probably a factor.

Decaffeinated coffee has shown steady growth in the U.S., accounting for about 17 percent of the market in 1989. Other growth segments include whole beans which now amount to 17 percent of retail sales. Gourmet and premium coffees, generally

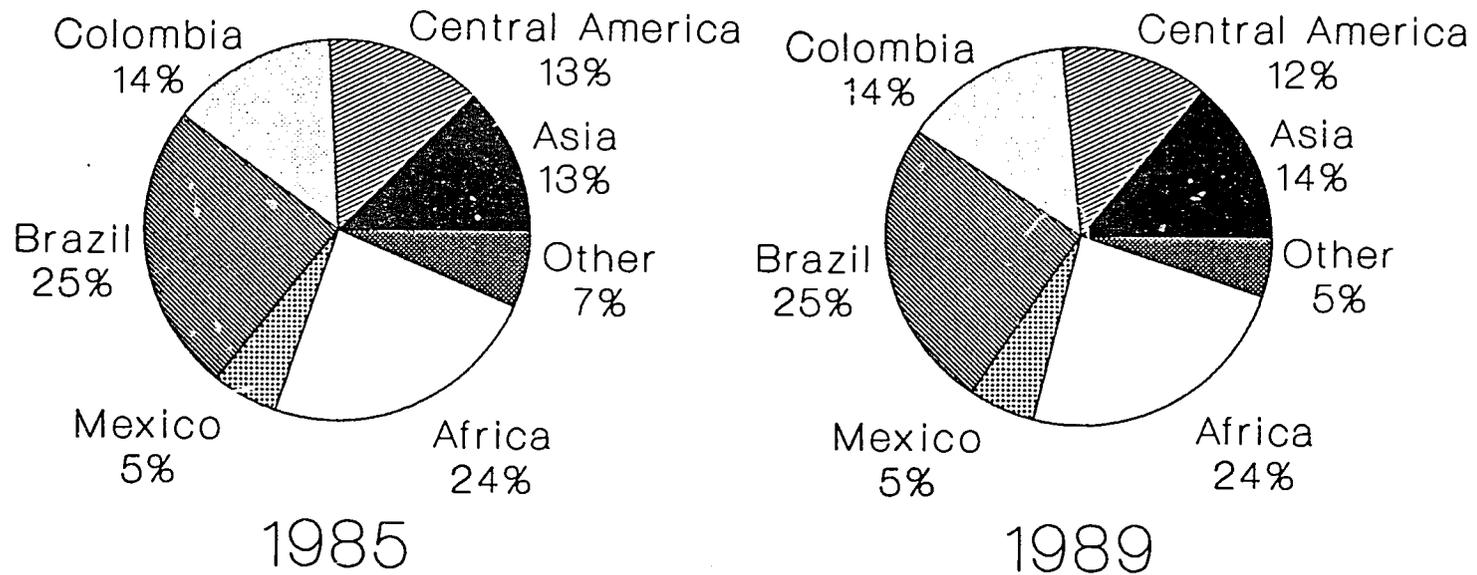
COFFEE EXPORTS

(Green & Roasted)

	<u>QUANTITY (tons)</u>					<u>VALUE (\$10,000)</u>				
	<u>1985</u>	<u>1986</u>	<u>1987</u>	<u>1988</u>	<u>1989</u>	<u>1985</u>	<u>1986</u>	<u>1987</u>	<u>1988</u>	<u>1989</u>
World	4,442,159	4,034,388	4,468,628	4,249,917	4,621,278	1,145,823	1,518,319	1,032,937	1,050,424	966,411
Brazil	1,033,619	477,913	987,609	904,357	943,374	236,921	200,594	195,920	200,895	161,031
Colombia	585,285	666,645	661,631	567,726	628,631	174,552	298,831	165,065	164,066	152,399
Costa Rica	123,568	93,583	138,624	119,586	130,454	31,613	37,203	33,449	31,646	28,625
Ecuador	75,308	108,801	102,119	75,663	89,000	17,910	33,681	19,957	15,472	14,202
El Salvador	148,092	123,195	145,575	123,034	83,479	45,256	51,257	35,134	34,680	19,934
Guatemala	172,508	154,843	145,800	140,781	184,060	39,122	52,526	35,450	34,957	37,999
Honduras	71,520	79,440	94,851	76,999	85,200	18,520	32,205	20,083	19,982	20,550
Mexico	227,273	208,330	223,046	169,559	271,697	56,911	87,896	52,274	48,041	58,483
Nicaragua	40,204	31,456	37,568	33,000	36,400	13,150	11,720	10,481	10,290	10,260
Peru	60,600	74,160	69,801	49,496	55,963	14,517	26,944	14,074	12,290	15,380
Other Latin America	138,815	170,904	144,322	159,047	35,852	43,119	65,259	41,147	47,368	39,149
Sub-Total Americas	2,676,792	2,189,270	2,750,946	2,419,248	2,674,110	691,591	897,846	623,034	619,597	558,012
Ivory Coast	240,793	229,795	165,135	235,000	180,000	60,912	67,442	39,322	45,800	38,000
Ethiopia	67,997	74,040	73,560	84,480	101,940	20,905	35,053	20,197	24,802	29,190
Kenya	104,679	126,497	99,977	87,684	104,300	28,140	48,177	24,131	27,420	25,150
Uganda	152,300	140,600	151,020	144,240	176,220	42,046	39,700	30,950	26,530	26,730
Zaire	67,900	129,000	89,203	68,000	98,471	16,964	30,882	16,819	11,600	14,320
Other Africa	358,759	312,479	31,766	342,021	315,747	85,223	105,819	71,786	71,584	57,053
Sub-Total Africa	992,428	1,012,411	910,661	961,425	976,678	254,190	327,073	203,185	207,736	190,443
Indonesia	285,528	298,174	286,304	286,304	298,972	55,991	81,844	53,556	55,023	51,700
Other Asia	244,147	271,957	223,306	273,212	289,253	56,032	83,094	48,127	56,903	48,400
Sub-Total Asia	529,675	570,131	509,610	559,516	588,225	112,023	164,938	101,683	111,926	100,100

Source: FAO

WORLD MARKET SHARES (Volume) Coffee Exports



COFFEE IMPORTS**(Green & Roasted)**

	<u>QUANTITY (tons)</u>					<u>VALUE (MM \$)</u>				
	<u>1985</u>	<u>1986</u>	<u>1987</u>	<u>1988</u>	<u>1989</u>	<u>1985</u>	<u>1986</u>	<u>1987</u>	<u>1988</u>	<u>1989</u>
World	4,194,512	4,238,654	4,547,778	4,263,172	4,668,410	1,176,595	1,668,977	1,214,793	1,160,910	1,115,771
United States	1,136,499	1,184,245	1,208,777	943,681	1,181,604	317,925	435,861	289,733	247,628	246,539
Europe	2,288,003	2,340,842	2,506,989	2,515,905	2,582,533	660,209	962,876	705,268	706,696	656,862
France	312,791	311,101	327,155	335,150	339,029	92,460	117,849	87,564	86,101	78,356
Germany (West)	525,088	571,396	619,410	644,713	680,095	159,273	240,594	178,236	188,252	181,852
Italy	284,215	254,119	264,725	257,709	268,852	82,826	96,581	75,460	67,531	65,388
Netherlands	173,928	176,446	185,077	183,819	172,661	52,212	74,503	52,995	54,109	46,687
Eastern Europe	203,352	243,506	247,150	260,551	242,896	47,115	97,874	68,392	70,109	59,448
Japan	231,392	243,014	271,534	265,495	286,206	68,311	103,347	73,253	75,547	78,423

Source: FAO

mild arabicas, represent the most rapidly growing segment. Office consumption is also increasing, also with a trend towards gourmet equipment. On the other hand, consumption of instant coffee is declining.

Importers and roasters have responded to consumer preferences by seeking to import more mild arabicas. New gourmet and 100 percent mild arabica ("mountain grown") brands have been launched and aggressively promoted, helped by Colombia's advertising campaign. The desire of importers to obtain more milds has been a major factor in the collapse of the quota system. Importers want to be able to buy more from countries that produce the desired quality, suggesting that **Central American countries (and Nicaragua) should be able to gain market share without the quota system.** The trend towards milds has widened the price margin between unwashed arabicas and milds to an extraordinary 62 percent in 1990, or \$0.34 per pound. (Table II-4 and Graph III-2)

Europe as a whole represents 55 percent of the world coffee market in terms of volume and 59 percent in terms of value (1989). Total European imports increased about 13 percent in volume and declined 2 percent in value between 1985 and 1989. Germany represents by far the largest market in Europe with a 26 percent share (volume), followed by France, Italy and the Netherlands. Germany also represents the most rapidly growing market, expanding 30 percent in volume between 1985 and 1989. The other country markets have been relatively stagnant. Eastern Europe's imports have increased about 19 percent over this period, reaching 9 percent of the European market.

Since Europe, and especially Germany, has historically preferred the mild arabicas of Central America, the demise of the quota system should also benefit this region in Europe.

Coffee trading system

Coffee represents the third largest traded agricultural commodity, behind meat and wheat. The ICO, which includes 50 exporting and 24 importing countries, accounts for about 90 percent of production and 85 percent of consumption. The International Coffee Agreement was first signed in 1962, and renewed in 1968, 1976, 1983 and 1989 (albeit without quotas). Quotas were in effect between 1963-72, 1980-86, and 1988-mid-1989. The quota agreements in the 1980's were (successfully) designed to keep prices within a range of \$1.15-1.45 per pound. Quotas were established on the basis of historical market shares, and enforced by requiring the use of ICO stamps on all exports and imports of member countries. Furthermore, under the terms for the 1988-89 crop, the total quota would be cut 1.5 million 60 kg. bags if the price went below \$1.15 for 10 consecutive days, and increased by a similar amount if the price went over \$1.45.

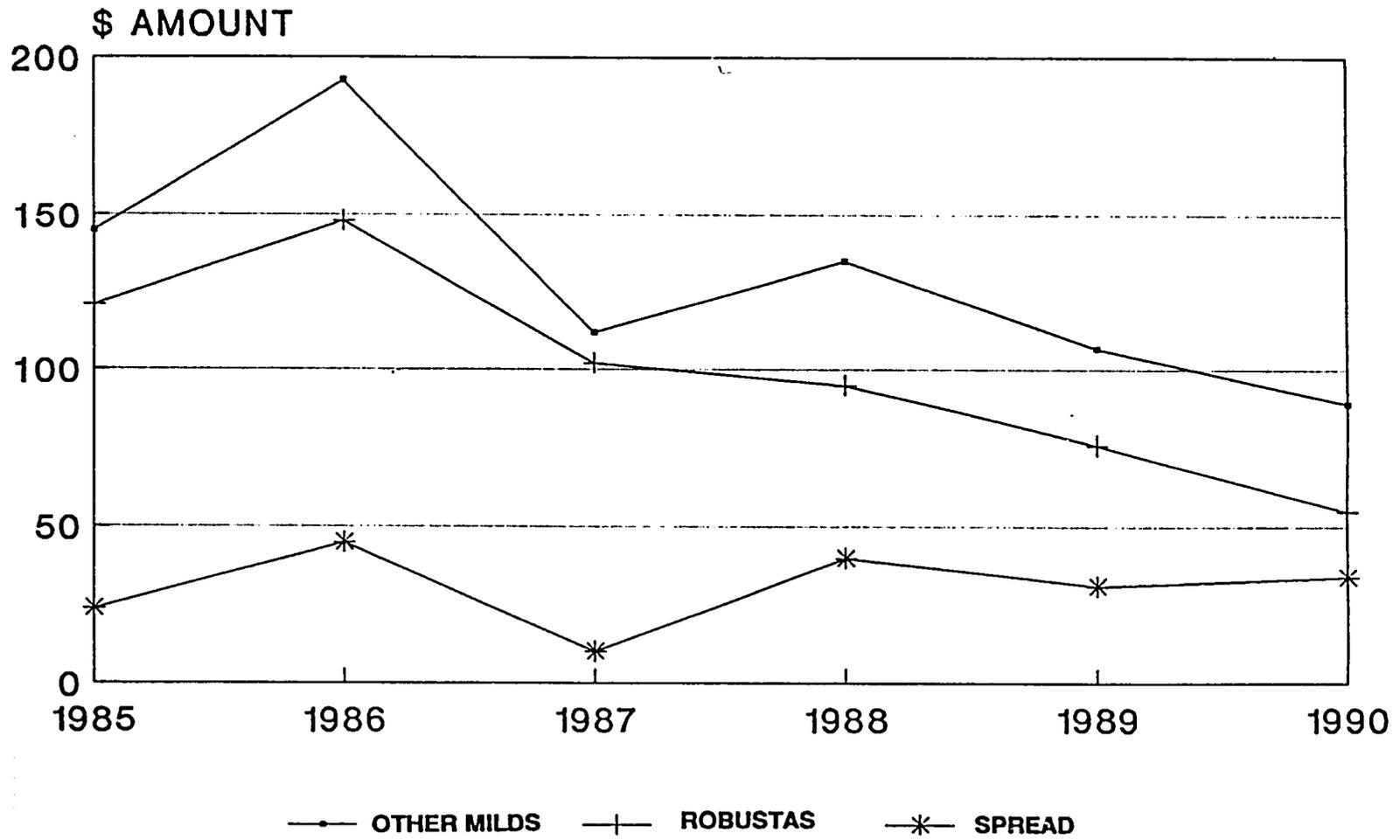
Table III-4

COFFEE PRICES, Green**(\$/100 lb.)**

	<u>OTHER MILDS</u>	<u>ROBUSTAS</u>	<u>SPREAD</u>
1985	145	121	24 (10%)
1986	193	148	45 (30%)
1987	112	102	10 (10%)
1988	135	95	40 (42%)
1989	107	76	31 (40%)
1990	89	55	34 (62%)

Source: FAO

PRICES FOR OTHER MILDS, ROBUSTAS & SPREAD



The principal factors that led to the collapse of the ICO meetings in 1989 include the following:

- Several exporting members allegedly were selling coffee, including premium quality, to non-member importers at discount prices (often between 25-50 percent). Member importers obviously resented having to pay significantly higher prices.
- Some of the non-members apparently re-exported coffee to member countries at reduced prices, thus circumventing the ICA quotas and creating tensions among member exporters.
- Importers wanted to respond to consumer preferences and import larger volumes of premium mild arabicas. However, Brazil tended to be adamant about maintaining historic market shares.
- During a no-quota period in 1986-87, demand for milds increased, while the price margins between varieties increased. This strengthened the resolve among importers to resist a continuation of the status quo, while also accentuating rifts between producers of milds and lower quality coffees.
- Quotas controlled exports, but not production or stocks. Consistent overproduction resulted in a large stock overhang (equivalent to 68 percent of total exports in 1989), tempting countries to cheat and importers to press for liberalized markets.

Because of strongly conflicting and entrenched positions, the outlook for the ICO (which will be meeting again this year in a last effort to save the agreement) is not very favorable.

Assuming the likely scenario that an agreement is not negotiated, the principal "winners" will be consumers. Not only would they benefit from lower prices (July 16, 1991 spot prices in New York were \$0.67 for Brazilian and \$0.91 for Colombian), but roasters would be able to obtain more of the preferred varieties. A second category of "winners" will be low cost producers (low-cost countries and/or low cost growers), who will be in the best position to survive an industry shakeout. Producers of milds (especially those with low production costs) will also benefit (relatively speaking) from more market share and probably even a higher price spread with lower quality coffees. The robusta producers will be the big losers of market share and suffer the sharpest price squeeze. For example, the spot price for Brazilian coffee is below the level of a year ago, while the Colombian price has stayed even.

Graph III-3 presents the most recent World Bank projections for overall coffee imports and prices. The projections assume a shakeout over the next few years,

followed by recovery of prices and volume in the mid-1990's. The assumption is that inefficient producers will go out of business, resulting in somewhat reduced production. On the other hand, the long term trend line for coffee prices suggests continued declines. Overall, the implication for Nicaragua is that it must be highly competitive in order to maintain and expand its market share.

2. The Nicaraguan Coffee Industry

Structure

The organization of coffee production in Nicaragua has changed considerably over the past decade, and continues to be in flux. (Graph III-4) Slightly over half of the land under coffee in 1989/90 involved small and medium scale growers and/or Sandinista cooperatives. It is estimated that cooperatives accounted for about 47 percent of the land in coffee (1989/90), up from 37 percent in 1987-88. Private commercial operations produced coffee on about 36,800 manzanas. However, the average size of holdings has declined since many of the largest were taken over by CAFENIC.

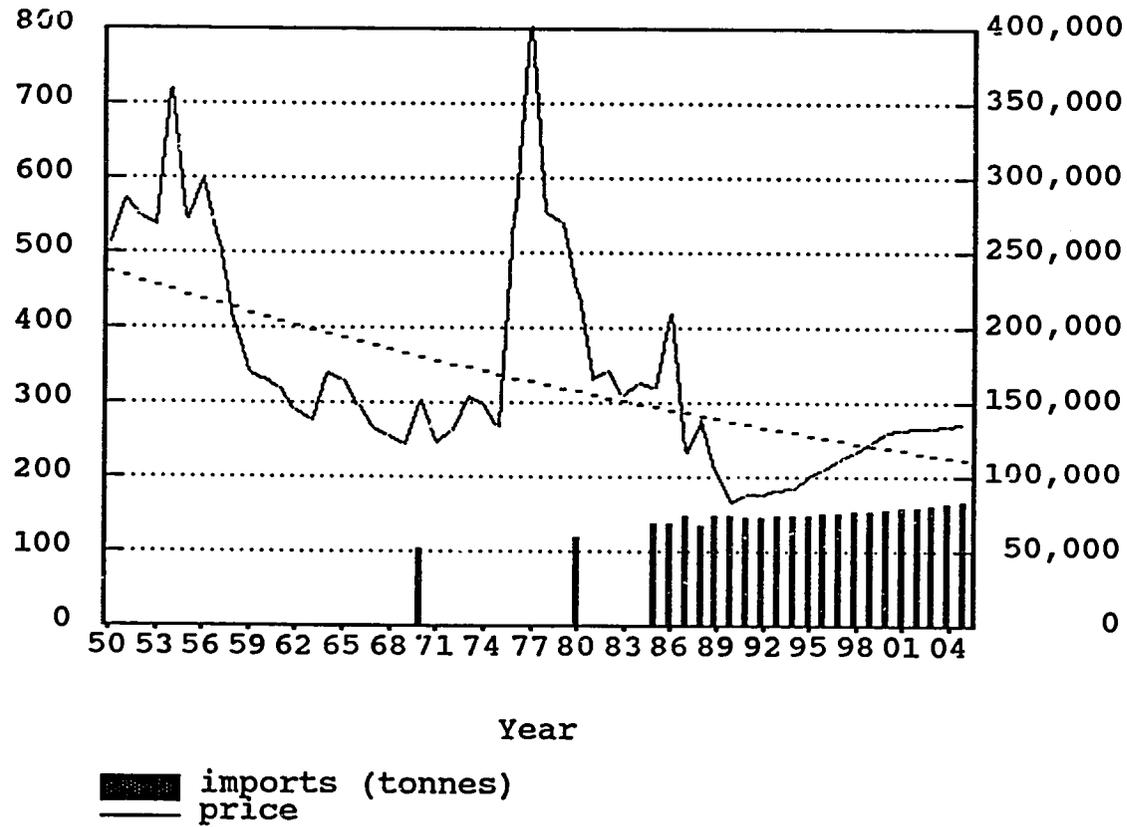
The state coffee producing sector included the 11 large haciendas organized by CAFENIC (incorporating confiscated properties including the Somoza family ownings), and a number of other state farms with some land devoted to coffee. The CAFENIC properties covered a total of 71,600 manzanas, of which about 11,000 are planted with coffee, producing about 100,000 quintales in 1990/91 and 152,000 the year before. Reportedly, the CAFENIC haciendas deteriorated until about 1984 when management was stabilized. The coffee plantations are in reasonable condition and it is believed by current CAFENIC management that yields should recover quickly under private management.

Privatization of CAFENIC is progressing rapidly. Former Somoza properties and selected others where "the political factor is the key determinant" are being distributed to demobilized soldiers and ex-contras. In these cases, the new owners have 90 days to organize themselves as a legal entity to take formal ownership. Some type of compensation for former owners is contemplated, probably in the form of bonds, but the exact mechanism has not yet been determined.

Properties returned to former owners are handled in two phases: provisional delivery, followed by a former valuation of any improvements on the property for which the owner must pay. No consideration is given to deterioration or damage. Furthermore, former owners are being asked to pay, on a pro-rated basis, the cost of indemnization of CAFENIC workers, currently calculated at about \$10 million or about \$69 per quintal of production. The plan is to deduct this amount from the

Graph III-3

World Coffee Market--Volume & Price
Actual & World Bank Projections
1985 cents per kg



credit offered by the BND (which would leave the former owners with virtually no credit for the next season). Otherwise, the properties are turned over without debt. CAFENIC handles the adjudication of cases.

The first phase (or provisional distribution/ return) was to have been completed by the end of June. The entire process is expected to be completed before the end of 1991.

The small and medium sized producers include both independent farmers and those organized into cooperatives. It is important to emphasize that small-medium scale growers played an important role in coffee production before the revolution, and that the principal change of significance has been their incorporation into the cooperatives beginning with the Sandinista government. One of the principal inducements to join the cooperatives was reportedly preferential access to credit, inputs, transportation and other services. For example, the Coffee Growers of Matagalpa report that they had about 7,000 members before the Revolution, most of them small-scale, but that over half joined cooperatives as the only way of obtaining needed credit and services. In 1987/88, for example, cooperatives accounted for 37 percent of the land under coffee, but 41 percent of the credit from the BND.

Most of the coffee cooperatives organized under the Sandinistas were Credit and Service Cooperatives (CCS) which tend to be loose affiliations of independent growers. The production cooperatives (CAS), designed as centralized collectives, have accounted for about 10 percent of the coffee coops (although they have received a higher percentage of the financing). In general, the principal service offered by the CAS has been assistance in obtaining credit, while the CCS claim to offer a broader package of services. It should be noted, however, that most of the cooperatives combine coffee with basic grains, cocoa and/or livestock. There is little information about what is happening to these cooperatives, but it appears that some are slowly disintegrating now that they do not necessarily provide preferential access to credit and services.

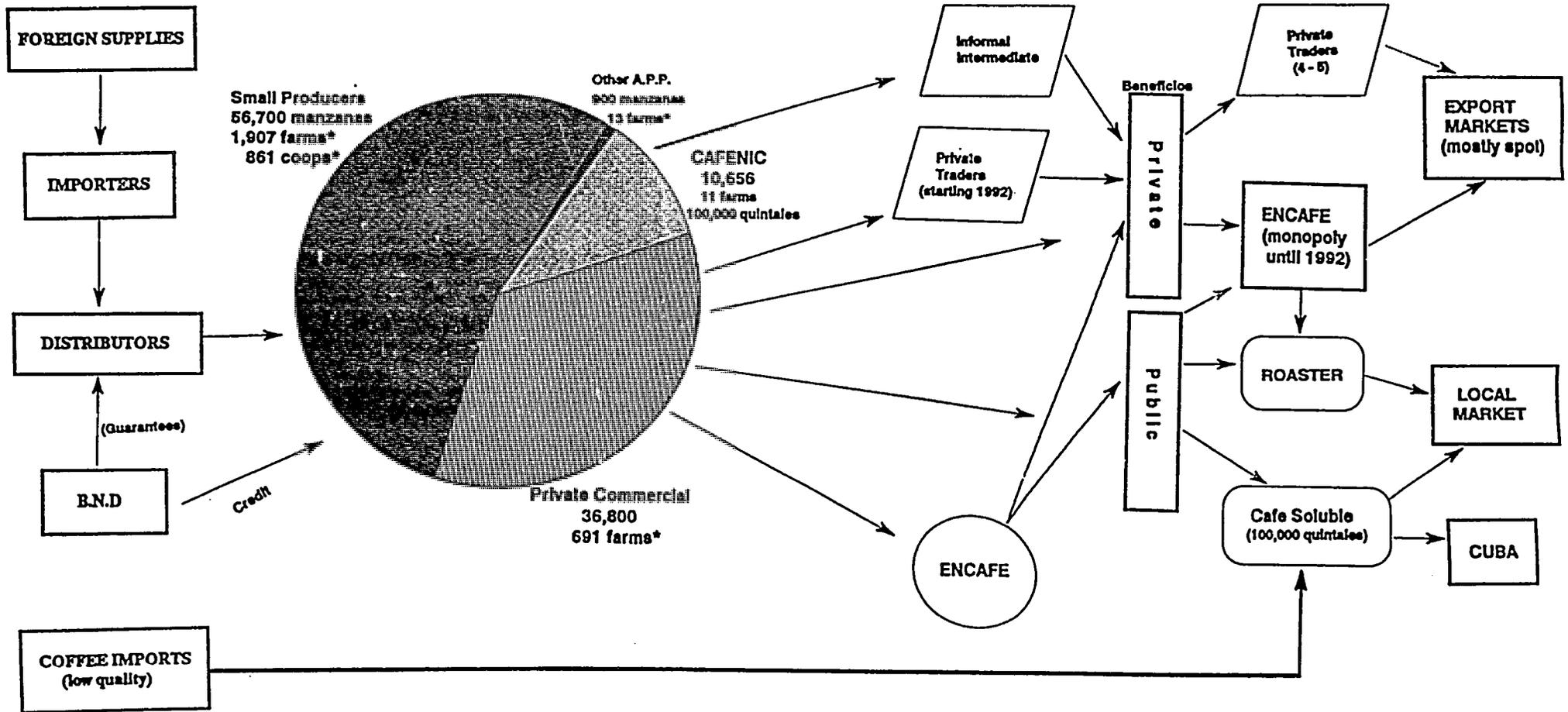
Producers of all types rely on the same sources for inputs and credit. Basically, fertilizers and basic implements have been imported and distributed by the corresponding state-owned companies, with private distributors playing a minor role with specialized chemicals. Inputs are purchased with a guarantee provided by the BND, based on average requirements calculated for the country as a whole. Credit for working capital (in cash), is supposed to be 70 percent of the projected gross income, and up to 80 percent of production costs. For 1991/92, a total of C.O. 212.2 million was programmed for coffee (78 percent cash and 12 percent in guarantees). This represented 28 percent of total agricultural credit for the year, and was

COFFEE SYSTEMS

INPUTS

PRODUCTION

PROCESSING AND MARKETING



* Number of operations receiving credit

59

supposed to finance production on 80,000 manzanas at an average of C.O. 2,653 per manzana.

All coffee must be sold to the state owned marketing monopoly ENCAFE. The only options growers have is whether to sell before or after washing and/or drying. Most small scale producers and those without "beneficios" sell immediately (cherries/ uva or washed) to ENCAFE, which in turn contracts either CAFENIC or private beneficios for washing and/or drying. Some private growers have continued to operate their own beneficios and sell their coffee ready for export at the Port of Corinto. However, this has reportedly been discouraged by the limited additional price offered to the growers by ENCAFE, who argue that the processing and transportation costs are not adequately compensated.

An unquantifiable amount of coffee is also sold (illegally) by growers to middlemen. This is motivated by ENCAFE's practice of making out checks co-payable to the grower and the BND. Since the BND subtracts the outstanding debt, including payments owed for inputs and finance charges for the guarantee, the farmer is left with little cash. By selling to middlemen, even at a discount, the farmer receives more cash. This system only works as long as the BND provides new credit to farmers that have defaulted on previous loans.

ENCAFE has also had a monopoly on exporting which it carries out through a combination of futures contracts and spot sales. The latter are largely due to the difficulty in producing coffee of consistent quality, such that foreign buyers are hesitant to enter into long term contracts. However, some growers concede that ENCAFE has probably succeeded in improving the quality of coffee by capitalizing on its monopoly position and being very strict in enforcing grading standards when buying from growers. Four basic quality grades are recognized, with the lowest quality retained for the domestic market and the instant coffee plant.

The principal complaint of growers is that they are not given any information about the prices which ENCAFE receives on world markets (thus making it impossible to know if they receive a fair price). Some growers also complain that the grading of coffee is based on criteria other than quality (i.e. political).

Cafe Soluble (which requires about 100,000 quintales per year) has imported much of its requirements of low quality coffee. The instant coffee is mostly sold domestically and exported to Cuba at very favorable prices under the terms of barter agreements.

The structure of the coffee industry is expected to change significantly in 1992. In addition to the privatization of CAFENIC, private traders are to be allowed to market and export coffee. So far, a number of firms have submitted applications to CONCAFE and been approved to operate as coffee traders. Some growers, however, are skeptical that these traders will have the needed collection/warehousing

infrastructure or even contacts and market outlets. From the perspective of growers, these traders will gain market share to the extent that they provide working capital. While this is feasible under the new banking law, the Superintendency of Banks has not yet issued a regulatory framework for non-bank sources of credit.

Another change will be the role of the emerging private banks which are expected to be enthusiastic about lending to the coffee sector, at least the larger growers and the traders (who in turn could on-lend to smaller growers). It is not yet clear, however, if the CCS will be able to organize themselves as real credit cooperatives and offer this critical service to their members.

The Comission Nacional del Cafe (CONCAFE) has emerged as a leading institution for providing services to the coffee sector. While it is a dependency of the Ministry of Agriculture, it has a seven person Board with four private representatives. Current plans include offering a broad range of services including: research and extension, market analysis and promotion, market information, statistics and project development. In addition, CONCAFE will have several regulatory functions, including: quality control and grading (all first quality coffee would require a CONCAFE seal of approval); and registration of all exports (presumably to control under-invoicing and other irregularities). It is important to note that CONCAFE is supported by a \$.25 per quintal tax, as well as a 2 percent tax to support the Coffee Institute to be managed by CONCAFE.

What remains unclear is which institutions, among the many contenders, will prove to be the most successful in providing services to small-scale coffee growers. The institutions currently vying for this "business" include: CONCAFE, the regional coffee growers associations, and the cooperatives/UCA's. Each of these organizations perceives itself to be the best provider of these services, and is vying for outside resources to be able to provide technical assistance, credit, inputs and marketing support.

Production

Coffee production in Nicaragua is found throughout the highlands, and particularly in the areas of Matagalpa, Jinotega and Nueva Segovia where soils and rainfall are considered to provide ideal conditions for mild arabicas. A total of 105,000 manzanas were dedicated to coffee in 1989-90. (Table III-5)

Although coffee has become by far Nicaragua's principal foreign exchange earner, it ranks last among Central American countries in production and exports. The figures indicate that the average annual output over the past four years (excluding the disastrous 1990/91 harvest) has declined about 24 percent from the historic highs in the 1976/77-1980/81 period. Most of the decline is attributable to a reduction in land

planted and harvested, although yields have also slipped. However, output declined an additional 30 percent in 1990/91.

The drop in acreage in the latter half of the 1980's appears largely due to the violence which was particularly severe in the coffee producing areas. Another factor may be the abandonment and/or confiscation of large commercial properties. The decline in yields, equivalent to about 11 percent, is less than what might be expected given the conditions, change-over of management of prime properties, and the reports of former/reestablished owners who speak of the terrible condition of their plantations.

However, it is possible that poor management practices and inadequate re-investment may only be fully reflected in the statistics starting in 1990/91 as the decapitalization begins to have greater impact on the trees. For example, it is reported that some of the prime properties (incorporated into CAFENIC), used to have yield of up to 50 quintales per manzana.. By 1989/90, the average for CAFENIC was down to 22, and in 1990/91 a dismal 14 quintales.

The yields also look worse when compared to other countries. The FAO data, indicates that as of 1987, Nicaragua's yields were the lowest in Central America and below world averages. This indicator of competitiveness has probably deteriorated further, with the possible exception of El Salvador which has also seen a disastrous decline in yields over the past few years.

Interviews and visits to selected farms indicate that some of the key problems affecting coffee production and yields, other than the violence and instability, include the following:

- **Low labor productivity** especially on the private commercial farms and former CAFENIC properties. The problem is typically presented in ideological terms centering around questions of ownership and employee rights. Regardless of who is right or wrong in these disputes the following tendencies adversely affect productivity:
 - Fiercely acrimonious owner-labor relations to the point where many owners are afraid to stay on their plantations (limiting their attention to management);
 - The cultivation of subsistence plots on the plantation property by workers seeking to supplement their incomes, a practice which many employees perceive to be a "right", and which more importantly requires much of their time.

- Very low wages of about \$1 per day which have declined in real terms with the devaluation, and which seem to be so low that some growers report a difficulty in finding workers (despite extraordinarily high unemployment rates).

SELECTED INDICATORS OF NICARAGUAN COFFEE PRODUCTION

	<u>PRODUCTION</u>	<u>EXPORTS(1)</u>				<u>QUINTALES/MANZANA</u>
	<u>QUINTALES</u>	<u>QUINTALES</u>	<u>AVG. PRICE (\$)</u>	<u>VALUE.(\$MM)</u>	<u>MANZANAS (000)</u>	
1976/77 - 1980-81 Avg.	1,215,960	N.A.	N.A.	N.A.	130.8	9.8
1981/82 - 1985/86 Avg.	1,169,900	1,064.4	124.8	130.0	125.3	8.6
1986 - 1987	942,000	673.1	162.9	109.6	110.1	8.6
1987 - 1988	834,500	813.6	163.5	133.1	103.0	8.1
1988 - 1989	944,500	673.9	125.5	84.6	102.1	9.2
1989 - 1990	932,200	732.5	122.4	89.6	105.0	8.9
1990 - 1991	650,000	815.7 ⁽²⁾	82.9 ⁽²⁾	67.6 ⁽²⁾	106.0	6.1

(1) Based on calendar year (exports from second half of prior cycle and first half of current cycle).

(2) Preliminary

Source: Central Bank and MAG

- **Infestation by the coffee borer (broca)**, especially since 1988, and which reportedly is ruining 5-20 percent of the beans, depending on the region. Adequate control programs are just now being initiated.
- **The decapitalization of coffee plantations** resulting from limited investment in replanting, pruning, and fertilizing, such that yields are beginning to drop dramatically. For example, some of the farms visited have applied fertilizer once or twice per year instead of the customary three applications.
- **Deterioration of roads, beneficios and other infrastructure**, increasing costs and adversely affecting quality. Some roads to remote farms are considered almost useless. Private farmers also report an almost crippling lack of transportation equipment available to transport coffee to the beneficios.
- **Changes in the composition of the labor force for harvesting.** Before the revolution, significant numbers of laborers came in from El Salvador for the harvest, mostly because coffee had a difficult time competing with cotton for seasonal labor. To deal with the labor shortages that resulted after the revolution when this practice was stopped by the Sandinistas, foreign volunteers were encouraged to help with the harvesting. However, poor picking techniques damaged trees for the following season. Although labor is now abundant, many men disdain harvesting coffee which they perceive as "women's" work. Thus, there tends to be a lack of experienced pickers.

Production Economics

Despite all the problems and low international prices, coffee production in Nicaragua remains profitable. Cost estimates developed by CONCAFE after the devaluation in April, 1991 (and believed by growers to be reliable) have been used as the basis for the pro-forma income statements presented in Table III-6. Perhaps the most surprising implication is that the lower the level of technology (and yield), the higher the profitability. If this is accurate, it suggests no incentive to invest in improved yields unless underlying distortions in the current environment are addressed.

The fact that some of the private farms visited are now following semi-technified practices, seems to confirm that the owners perceive this approach to be more attractive under current conditions. Some of the factors which influence the relative profitability figures are outlined below.

The high technology farms (mostly the CAFENIC properties and some large private plantations), shown in the table, assumes applying all the recommended applications of fertilizer and pesticides, as well as the appropriate care of the plantations. However, the model shows yields of only 22 quintales which is extraordinarily low if the right agronomic practices are being applied. Yields of 40-50 quintales should be achievable which would result in a doubling of revenues.

The missing ingredient seems to be management and/or productive/ sufficient labor for carrying out very labor intensive and meticulous agronomic practices. At the root of the problem is acrimonious labor-management relations, partly ideological, but also undoubtedly due to the exceptionally low wages (less than \$1 per day). This problem was confirmed by field visits in which large scale growers complained of extremely low productivity and very poor relations, while also finding it difficult to find people to hire in an environment of high unemployment. If progressive managers were to double their wage bill (with more and/or better compensated labor) in order to increase productivity and yields, their total agricultural costs would increase by only C\$. 2,570 (48 percent) per manzana, since input purchases would remain the same. However, revenues should increase by over C\$. 8,000, thus increasing profitability substantially.

The low average yield on non-CAFENIC, large scale plantations, indicates that most of these growers are using the medium-technology model. Field visits confirmed that because of limited credit and uncertain conditions, these growers are applying only one or two fertilizations per year, minimum pesticides, minimum cleaning, pruning and maintenance, and virtually no re-planting. This strategy is currently producing adequate returns (confirmed by growers), but is likely to be increasingly counterproductive. Plantations are aging, undernourished and increasingly subject to "broca", such that yields and quality are declining rapidly. While costs cannot be significantly further trimmed, revenues will be reduced both by lower yields and inferior quality grades (lower prices). At some point, these growers must decide whether to invest in their plantations (and in effect become "technified") or slide into the traditional, small farmer cultivation model.

The high returns for traditional growers confirms the viability of coffee on small units. However, it must be remembered that the costs understate the value of family labor, and that the growers family must live off of the net income from a small number of manzanas. The real question is whether there is any incentive for these

Table III-6

PRO FORMA INCOME STATEMENT
FOR COFFEE PRODUCTION

(Cordobas Oro Per Manzana)

	<u>TECHNIFIED</u>	<u>SEMI-TECHNIFIED</u>	<u>TRADITIONAL</u>
Revenues:	<u>8,250</u>	<u>4,500</u>	<u>1,875</u>
Quintales/manzana	22	12	5
\$/Quintal	375	375	375
<u>Cost of Goods Sold:</u>			
Materials	2,651	1,001	42
Labor-Pre Harvest	1,026	607	258
Other (services)	751	44	6
Labor-Harvest	<u>1,542</u>	<u>966</u>	<u>468</u>
	5,970	2,618	774
Gross Profit	2,956	1,882	1,101
<u>Processing:</u>	936	510	213
Transport/Bags	135	71	31
G&A/Overhead	169	107	52
Depreciation (includes. 5% new plants)	<u>200</u>	<u>115*</u>	<u>15*</u>
	1,440	803	311
<u>Profit before interest & Taxes:</u>	<u>1,516</u>	<u>1,079</u>	<u>790</u>
Interest (short term only)	370	171	47
Taxes (2% &.25/Q)	<u>165</u>	<u>90</u>	<u>8</u>
Net Profit	981	818	735
Return on Sales	11.9%	18.2%	39%

* Does not include re-planting.

Source: CONCAFF.

growers to invest in improved agronomic practices (which would require more purchased inputs and probably replanting). An appropriate technological package which increases yields/revenues more than costs, combined with financing, will be required. However, the potential for improvement in terms of yields, total output, and grower income, is substantial.

3. Outlook and Issues

Potential output

There is a general consensus in Nicaragua, borne out by the present analysis, that coffee represents a major opportunity area for the country. Not only does coffee offer by far the largest and most immediate source of export earnings, but it is also labor intensive (about 2 people per manzana).

As discussed above, the most immediate opportunity for the expansion of coffee is through the **improvements in yields** - A modest scenario for increasing yields over the next five years would involve:

- Tripling yields in ten years (over dismal 1990/91 levels) on the CAFENIC farms being returned to former owners and a 50 percent increase in yields on CAFENIC farms being distributed to workers or demobilized military personnel. Given 1990/91 yields of 14 quintales/manzana, about 8,000 manzanas being returned, and 2,600 being distributed, the production in 1995/96 would be 318,500 in five years and 385,000 in ten years for an average yield of 35 by 2001/02. Note that these yields are still extremely conservative by historic and regional standards, but take into consideration the time required for replanting and renovating, and for new management practices to be introduced.
- Doubling yields over ten years on the 56,700 manzanas using "traditional" techniques. Again this represents a slight improvement over historic yields rather than any major technological transformation of this sector. However, a rehabilitation project recommended by RUTA in March 1990, suggests that yields from small scale producers would be doubled with an intensive credit and technical assistance project.
- Doubling yields on the 37,700 manzanas in coffee on other commercial farms in five years, with an additional increase to 26 quintals by 2001/02.

- Harvesting and slowly renovating or replanting the 30,000 manzanas abandoned since 1980. Even if only 3 quintales are recovered over the short term, while replanting takes place, about 90,000 quintales would be produced annually over the next five years, and significantly more thereafter.

Thus, production of 1,300,000 quintales should be within reach by 1995/96 as a result of modest increases in yields. This takes into consideration the fact that yields in the Pacific growing region will not increase as much as northern regions which have better natural conditions. By 2001/02, output should be at least 1,950, or triple the 1990/91 level. For 1991/92, the consensus projection is for output of 600,000 - 650,000 quintales, which at \$90, would generate \$54 million in exports.

Beyond improving yields, it is believed that Nicaragua has a 50,000 manzanas of "optimal" land for coffee, which is currently Un- or underutilized. If planted with coffee, utilizing appropriate techniques, this land would provide additional production (and jobs) over the medium term.

In summary, a reasonable projection for overall coffee production in Nicaragua is as follows:

	<u>1990/91</u>	<u>1996/97</u>	<u>2001/02</u>
Manzanas in coffee	106	130	130
Yield	6.1	10	15
Output (quintales)	650	1,300	1,950
Price/Quintal	90	100	120
Dollar value (\$MM)	58.5	130	234

Markets

Markets should not be a constraint to this increase in output. First, of all, Nicaragua's output represents a tiny fraction of world trade in coffee, and a large increase in Nicaragua will hardly make a difference to world supply/demand. Second, as outlined above, the type of coffee produced in Nicaragua is expected to increase its share of world markets, while prices seem to have almost bottomed out for the medium term. Thus, for Nicaragua, the key issue is whether it can produce coffee profitably at the current low price, while investing in rehabilitation and expansion. In other words, the discounted cash flow must be positive after factoring in the deferred investment/depreciation of the past decade. Whether returns are

adequate will depend on internal macroeconomic policies (especially related to foreign exchange and financial markets) and the ability to address microeconomic constraints. These are briefly outlined below.

Constraints

The principal challenges to be met, if Nicaragua's coffee sector is to begin to meet its potential, are summarized below:

- **Labor-management relations**, especially on the large commercial farms. As indicated earlier, the key to improved yields on these farms will be improved agronomic practices, which in turn will require more focused management attention and better performance from labor (higher productivity and quality). It would appear that compensation or even "profit sharing" tied to higher productivity/yields would be the most powerful means of overcoming this critical constraint. By diffusing some of the current antagonism, this would also allow owners to spend more time on managing their farms, while reducing the risks to their personal safety and the threats of land invasions.
- **Foreign exchange rates**, given the high domestic (labor) content in coffee production. The current fixed rate policy, at a rate believed to be as much as 50-60 percent overvalued, puts increasing pressure on producers whose prices are in dollars. Unless productivity is increased, the only way for producers to stay competitive is to keep wages as low as possible, which in turn leads to acrimonious labor relations, inability to find quality workers, and low productivity. For small scale producers, and workers on larger plantations, the resulting low income (in cordoba terms) forces them to spend much of their time on inefficient subsistence plots rather than on improving yields on a crop in which Nicaragua should have a competitive advantage.
- **Financing**, especially multi-year credit for rehabilitation, replanting and new plantations. The requirements to reach the yield and output projections indicated above can be estimated as follows:

	<u>Manzanas/Yr</u>	<u>\$/Manzana</u>	<u>\$/Year (000)</u>
<u>Commercial farms</u>			
Renovation	3,500	1,000	3,500
Replanting	2,500	1,400	3,500
New plantations	2,000	1,500	3,000
<u>Small prod./coops</u>			
Renovation/Rehab	6,000	1,000	6,000
Salvage	5,000	1,000	5,000
Total/Yr	19,000		21,000
Total/ 5 Yr.	95,000		105,000

The assumptions on investment requirements per manzana are derived from interviews with commercial growers, RUTA and CONCAFE. With an average loan term of two years, the total long term credit fund would be about \$50 million.

Short term credit is somewhat less of a constraint since it has generally been made available by the BND. However, since BND is not financially viable, its ability to meet credit demands depends on whether the Central Bank is willing/able to provide the necessary funds. To some extent, the short term credit requirements can be addressed by the emerging private banks and trading companies. However, given the modest size of the new banks (about \$2 million in capital each, implying a lending capacity of no more than \$10-20 million); the lack of rural branches, and the need to diversify their portfolios limits the potential lending to coffee, especially to smaller scale growers. The ability of traders to fill the void is questionable given the unclear legal status for this type of financial intermediation.

- **Infrastructure and equipment**, including roads to remote, but prime coffee growing areas, and basic farm and transportation equipment. Basically, no investment has been made over the past decade in maintaining or extending rural roads. Equipment is either non-existent, obsolete or inappropriate. No investment has been made to upgrade beneficios, especially private.
- **Know-how and technology**, for all categories of growers, is required to improve yields. This know-how generally exists, but must be transferred and adopted. For larger plantations, know-how includes: techniques for managing the "broca"; new ideas on higher planting densities and varieties; models for improving labor relations and

productivity. Traditional growers require more basic know-how on agronomic techniques that will increase yields more than the cost of the improvements. However, except for the incipient CONCAFE structure, there are no adequate institutions for disseminating technology. Regional producer associations, coops and other possible mechanisms remain weak.

Alternative Initiatives

Some of the programmatic initiatives that can help address the principal constraints and allow Nicaragua to realize its potential in coffee are outlined below. These ideas are intended for discussion purposes, and are not mutually exclusive. The initiatives suggested can also be the focus of funding by international donor agencies.

- **Developing the capability of regional coffee associations to deliver services.** This is already contemplated under USAID's project in support of UPANIC. The idea would be to broaden membership to include small scale growers and possibly coops, and develop services with the greatest impact on alleviating constraints to increased yields. Some of the most important services could include:
 - Seminars on management and employee relations;
 - Technical extension services;
 - Bulk purchases of inputs;
 - Establishment of a savings/credit mechanism;
 - Rental of equipment and/or transportation services.
- **Establishment of a fund for the rehabilitation of coffee,** offering two year loans for the rehabilitation and partial replanting of existing plantations. This fund could be channeled through the new commercial banks and/or regional producer associations and independent coops.
- **Strengthening of the services offered by CONCAFE.** Since this organization appears to have established credibility with both the private and public sectors, it could be further developed as the vehicle for advocating an adequate policy framework for coffee. CONCAFE can also be a useful mechanism for disseminating information to regional associations regarding management issues, agricultural

techniques and market developments. The key to success will be to ensure private sector control of Board or even full privatization.

- **Farm to market road building program** with emphasis on prime coffee growing areas in the north.

B. COTTON SYSTEM

Cotton is the second most important export crop (second to coffee both in area and value), produced on about 45,000 ha in 1990. Cotton production is a matter of special concern to the GON because of its rapid declines in area, yield and export value during the 1980s (from 2.47 million qq exported in 1979 to 0.52 million qq in 1990; and, from an export value of \$135.7 million to \$36.6 million during the period).

1. World Cotton Outlook

USDA forecasts world cotton production to increase to a record 91.1 million bales in 1991/92, a 5 percent increase over year earlier levels. The current U.S. crop is now estimated at 17.6 million bales, up 13.5 percent from last year and the largest crop since 1937. However, U.S. production accounts for only about 19 percent of the world total; large production increases are projected for China (up 6 percent), India (up 9 percent), and Pakistan (up 4 percent). Output in the USSR is projected to fall about 6 percent this year.

During the 1980-91 period, world production increased an averages of 3.2 percent annually, primarily the result of yield increases (an average of 2.4 percent annually) although area also increased 0.7 percent per year on the average. The pace of world consumption growth was significantly slower, an average of 2.6 percent per year and carryover stocks grew steadily throughout the period, from 19.7 million bales in 1980 to a projected 23.6 million bales by the end of 1991.

For the 1990-91 marketing year, world cotton prices were generally increasing until last spring. The potential for record world production and limited growth in consumption moved prices lower through the summer; for example, the U.S. spot price averaged \$0.71 per pound in July 1991 compared to \$0.84 per pound in May. USDA's adjusted world price was \$0.60 per pound in July, about \$0.06 lower than in May and by late August, the world price had declined further to \$0.537 on the prospects of a record world crop.

In general, world cotton production has been increasing more rapidly in exporting countries than consumption is growing in importing countries (and from a larger base), implying pressure on world cotton prices for some time in the future. Production growth in net exporting countries averaged 3.2 percent annually during the 1980s, and exports from those countries grew an average of 1.5 percent annually. At the same time, consumption in importing countries grew only an average 1.4 percent annually, reflecting both slow world economic growth and increasing competition from local producers. (Tables III-7 - III-10)

Cotton markets are highly sensitive to economic growth patterns and to prices of substitutes (which reflect petroleum costs, among other factors). However, in the absence of major increases in economic growth or petroleum prices, world cotton

supplies likely will be more than adequate and prices significantly below early 1991 levels for much of the foreseeable future. The most optimistic scenario, reflecting World Bank projections, suggest further declines in prices over the short term with no real increase through the end of the decade. The long term trend line, however, suggests further price declines. (Graphs III-5 and III-6).

2. Nicaraguan Structure

There were 374 cotton producers in Nicaragua in 1989 (including 18 large state owned farms). The state farms controlled just under one-third of the area, medium and small producers accounted for about one-half of the total, while larger commercial producers accounted for one-fifth. Recent growth has been from moderate sized, commercial producers rather than the more traditional, much larger operations. In addition, the cooperatives include a large number of small-scale growers. The relative importance of small-medium sized producers is the principal structural change from the 1970's when large commercial operations dominated.

STRUCTURE OF COTTON PRODUCTION IN NICARAGUA

	<u>Number</u>	<u>Area (mz)</u>	<u>Share (%)</u>	<u>Average mz/farm</u>
State Owned	18	15,600	32	867
Cooperatives	86	---	---	---
Private	356	33,600	68	94
Total	374	49,200	100	132

Source: MAG

There are 23 cotton gins in Nicaragua, with five managed by the government, 7 by cooperatives and the rest by private owners. (Graph III-7) Empresa Nacional Algodon (ENAL), is the government-owned cotton buying agency, traditionally has served as the only buyer and exporter. However, GON has announced that in 1991 it will permit private exports in order to increase competition and reduce marketing margins for cotton. Comission Nacional del Algodon serves as the government's primary policy making body. Two associations represent producers [Asociacion de Algodoneros de Leon, Chinandega, y Managua and Union de Algodoneros y Ganaderos (UNAG)].

Small amounts of textiles are produced in Nicaragua from domestic cotton, but most of the crop is exported (94 percent in 1988 and 1989). Amounts of cotton used domestically have declined sharply since 1987 when the largest domestic textile producer quit operating. Five domestic cottonseed crushers buy seed locally and produce meal and vegetable oil for the domestic compound feed and vegetable oil market.⁸

⁸ Each 100 pounds of cotton (field weight) produces about 35 pounds of clean cotton lint and 48 to 50 pounds of cottonseed. Nicaraguan producers project a 1990/91 yield of 36.46 qq/mz implying production of 17.5 qq of seed and 12.77 qq of clean lint. At current prices, such a crop would yield about C\$ 473 from seed plus about C\$ 4725 from line, with a total return of C\$ 5197 mz.

Table III-7

WORLD COTTON SUPPLY AND USE

<u>Year</u>	<u>Harvested Area</u> (million acres)	<u>Yield</u> (lbs./acre)	<u>Beginning Stocks</u>	-----million 480 lb. bales-----		
				<u>Production</u>	<u>Consumption</u>	<u>Exports</u>
1960	79.4	305	19.6	45.1	46.2	17.1
1965	82.3	372	28.6	57.1	53.8	17.0
1970	78.6	377	22.4	55.1	57.1	17.1
1975	73.9	393	33.0	53.9	61.6	19.1
1980	79.2	440	21.3	64.7	66.1	19.7
1985	78.3	553	44.2	80.4	76.9	20.3
1986	72.8	522	48.5	70.7	82.8	26.0
1987	76.7	569	35.9	81.0	84.1	23.2
1988	83.3	547	32.8	84.7	85.3	25.9
1989	80.0	552	32.0	80.0	86.5	24.0
1990 ¹	82.4	566	26.4	86.7	85.6	23.4
1991 ²	85.9	570	27.5	91.1	88.0	23.6

¹ Estimated² Forecast

SOURCE: USDA

Table III-8

COTTON SUPPLY AND USE, NET EXPORTING COUNTRIES

<u>YEAR</u>	<u>HARVESTED AREA</u> (1,000 hectares)	<u>YIELD</u> (kilograms/ hectare)	<u>BEGINNING STOCKS</u>	<u>PRODUCTION</u>	<u>IMPORTS</u>	<u>TOTAL SUPPLY</u>	<u>CONSUMPTION</u>	<u>LOSS</u>	<u>EXPORTS</u>	<u>ENDING STOCKS</u>
1960	30,548	310	14,657	43,517	2,232	60,406	30,522	-358	16,448	13,794
1965	31,783	378	23,840	55,191	2,125	81,156	37,480	-277	16,380	27,573
1970	30,411	381	17,454	53,244	2,496	73,194	39,798	-110	16,949	16,557
1975	28,280	400	27,375	51,957	1,748	80,780	43,209	18	18,210	19,343
1980	30,509	446	15,236	62,523	3,882	81,641	47,040	98	19,317	15,186
1985	30,219	562	38,801	77,996	1,271	118,068	55,147	87	19,589	43,245
1986	28,004	529	43,243	68,003	1,599	112,847	58,792	4	24,906	29,145
1987	29,489	579	29,145	78,735	1,509	109,029	59,996	381	22,342	26,309
1988	31,993	555	26,309	81,514	2,981	110,805	60,713	486	24,453	25,152
1989	29,961	560	25,152	77,111	3,647	105,911	63,089	74	22,915	19,832
1990	31,746	576	19,832	83,941	3,905	107,678	63,583	53	22,336	21,705
1991 ¹	33,179	579	21,705	88,257	2,988	112,950	65,858	182	22,639	24,270

¹ Forecast

Table III-9

COTTON SUPPLY AND USE, NET IMPORTING COUNTRIES

<u>YEAR</u>	<u>HARVESTED AREA</u> (1,000 hectares)	<u>YIELD</u> (kilograms/ hectare)	<u>BEGINNING STOCKS</u>	<u>PRODUCTION</u>	<u>IMPORTS</u>	<u>TOTAL SUPPLY</u>	<u>CONSUMPTION</u>	<u>LOSS</u>	<u>EXPORTS</u>	<u>ENDING STOCKS</u>
1960	1,571	215	4,904	1,550	15,082	21,536	15,703	63	689	5,081
1965	1,543	239	4,722	1,696	14,983	21,401	15,311	17	577	4,496
1970	1,390	287	4,995	1,829	16,321	23,145	17,285	147	799	4,914
1975	1,609	269	5,331	1,986	17,719	25,636	18,356	127	886	6,267
1980	1,546	310	6,048	2,199	16,812	25,059	19,047	20	397	5,595
1985	1,453	365	5,349	2,436	20,138	27,924	21,785	149	711	5,278
1986	1,453	402	5,278	2,680	24,087	32,046	23,984	150	1,108	6,803
1987	1,533	374	6,803	2,635	22,260	31,699	24,138	153	885	6,522
1988	1,708	401	6,522	3,148	23,341	33,012	24,568	138	1,415	6,890
1989	1,589	398	6,890	2,904	21,508	31,303	23,444	166	1,081	6,611
1990	1,592	371	6,611	2,712	19,725	29,049	22,058	129	1,054	5,807
1991 ¹	1,583	390	5,807	2,844	20,313	28,965	22,175	55	1,002	5,732

¹ Forecast

Table III-10

FOREIGN COTTON SUPPLY AND USE

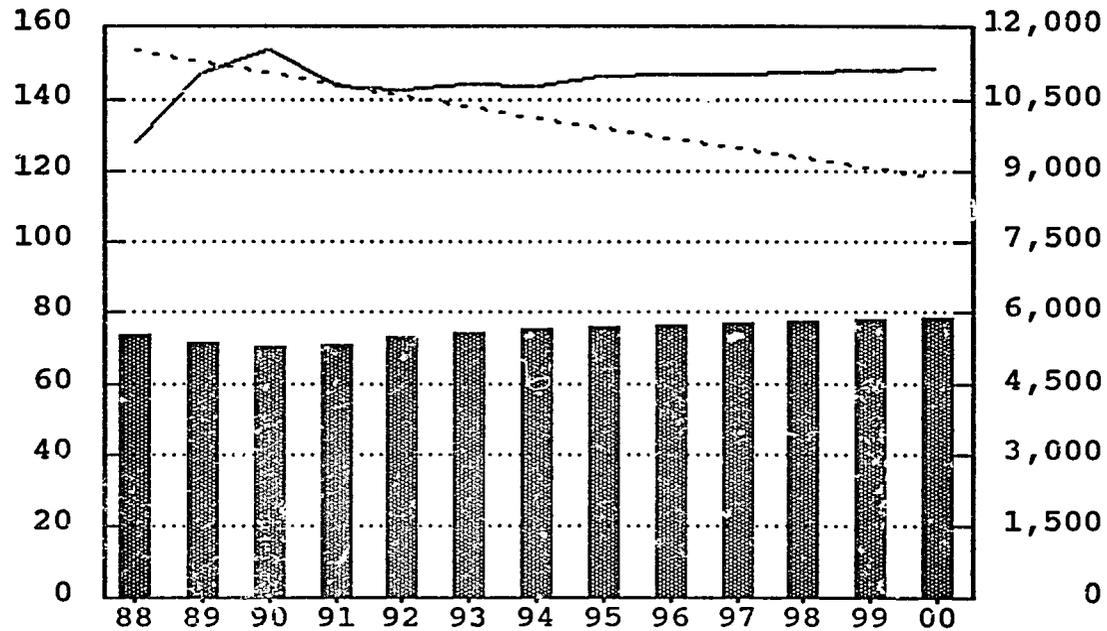
<u>Year</u>	<u>Harvested Area</u> (million acres)	<u>Yield</u> (lbs./acre)	<u>Beginning</u>	<u>Production</u>	<u>Consumption</u>	<u>Exports</u>
			<u>Stocks</u>	-----million 480 lb. bales-----		
1960	64.1	259	12.1	30.8	37.8	10.3
1965	68.7	328	14.3	41.9	44.2	13.9
1970	67.4	358	16.6	44.9	49.0	13.9
1975	65.1	377	27.3	45.6	54.3	15.8
1980	66.0	437	18.3	53.6	60.2	13.8
1985	68.0	530	40.0	67.0	70.5	18.3
1986	64.3	510	39.2	61.0	75.3	19.3
1987	66.6	535	30.9	66.3	76.5	16.6
1988	71.3	522	27.1	69.3	77.5	19.7
1989	68.4	533	25.0	67.8	77.8	16.3
1990 ¹	70.6	542	23.4	71.2	77.0	15.5
1991 ²	72.5	545	25.3	73.5	79.2	16.6

¹ Estimated² Forecast

SOURCE: USDA

Graph III-5

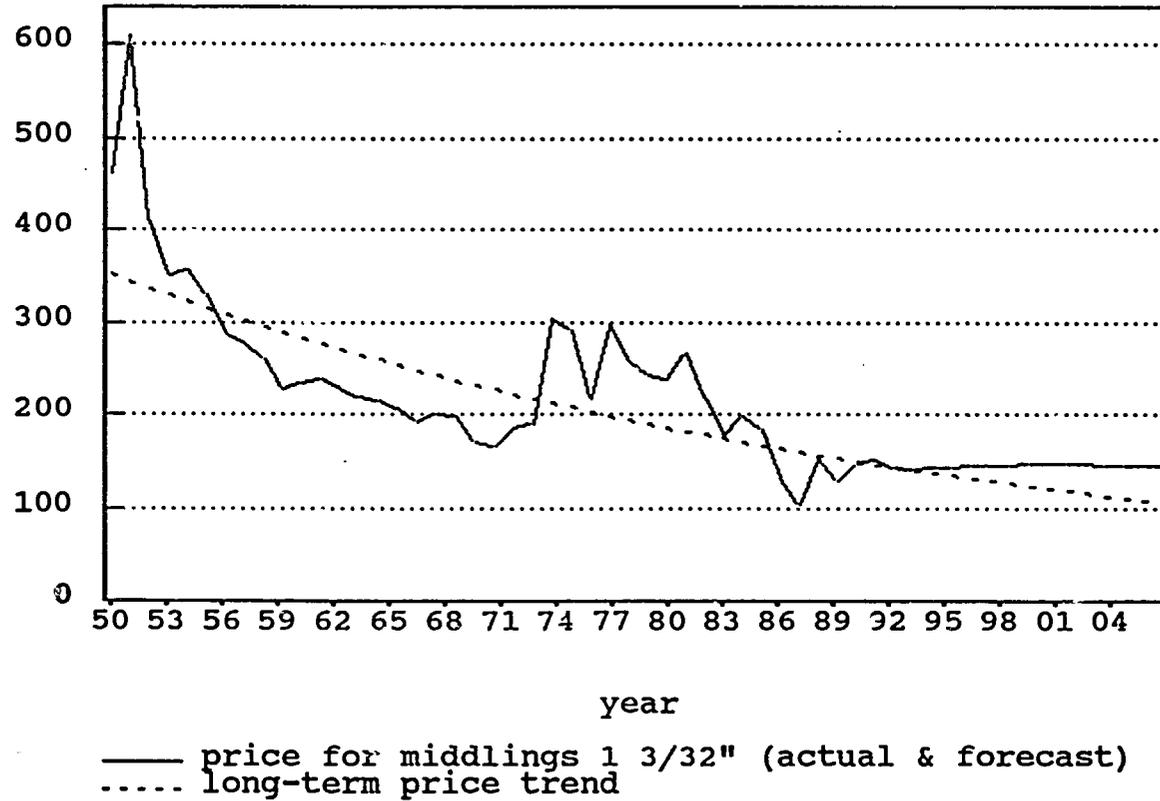
World Cotton Trade
Actual Price & World Bank Forecast
1985 cents per kilo



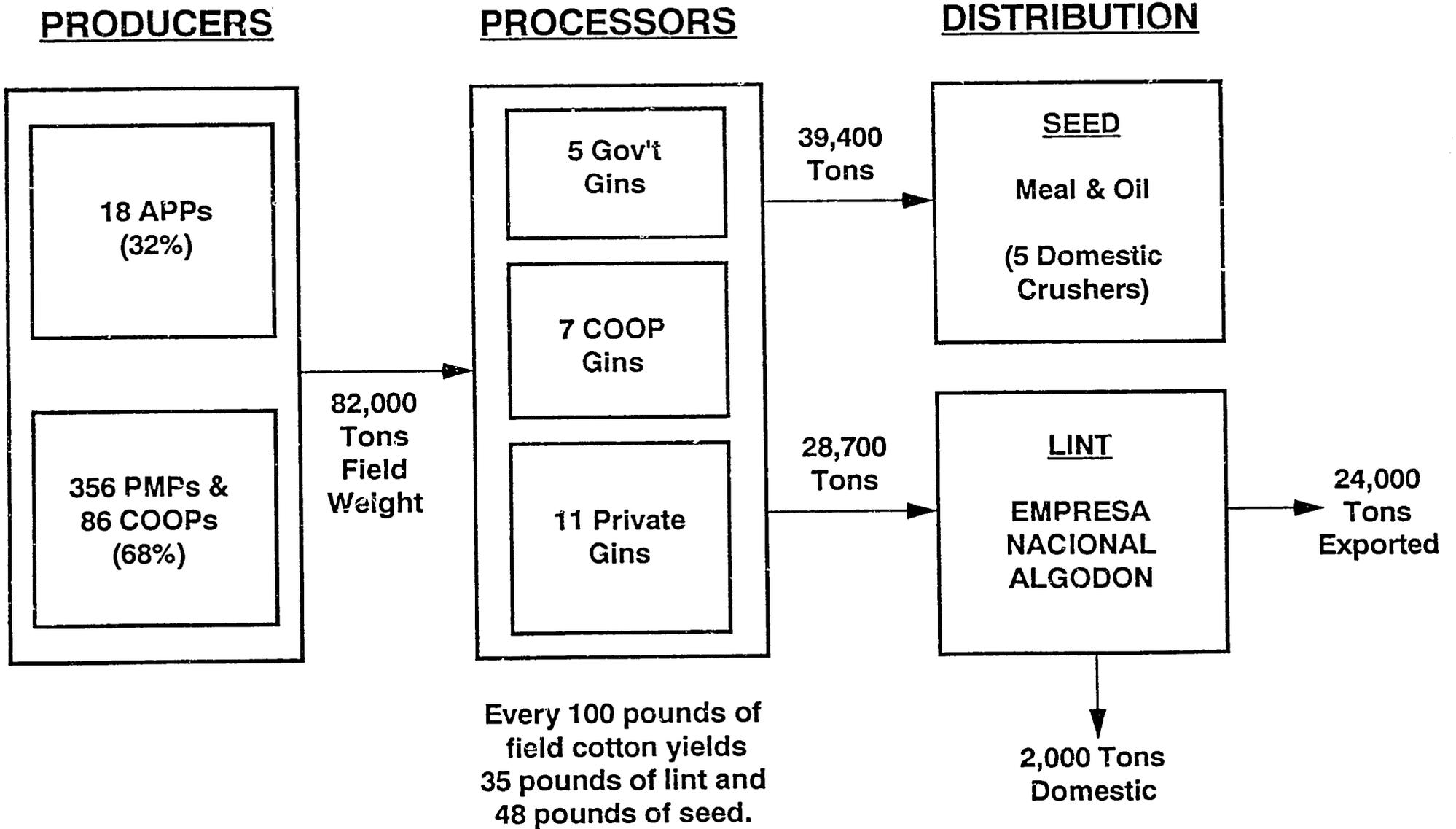
■ world imports in kilotonnes (actual...
— price for middlings 1 3/32" (actual...
..... long-term price trend

Graph III.6

World Cotton Trade
Actual Price & World Bank Forecast
1985 cents per kilo



Cotton System



Since the effective price for cotton in Nicaragua is dominated by world market prices, both nominal and effective rates of protection are small (nominal protection is effectively zero). Effective protection at the official exchange rate is 0.96 as exchange rate subsidies in input purchases are slightly more than offset by the conversion of export earnings to cordobas.

At the lower "equilibrium" exchange rate, effective protection levels decline to 0.58 as import subsidies become much less important and cordoba returns increase.

In spite of cotton's heavy dependence on imported inputs, and based on costs as indicated in Table III-2, its DRC is a marginally favorable 4.89 (at the official exchange rate of C\$5/U.S. dollar) at current world prices and projected yields. However, to the extent that the industry fails to realize its expected yields (or world prices fall as is likely), the DRC would increase rapidly to levels that would make cotton an inefficient earner of foreign exchange.

The Comision Nacional del Algodon officially expects that cotton production will be profitable in 1991, with yields of 34.46 qq/mz, field weight and prices above \$0.70 per pound in the world market. However, even given these favorable circumstances producers' returns will be only slightly above production costs (C\$ 5.79, less than 1 percent), and both projected yields and prices are highly optimistic in view of recent performance.⁹ If yields are no better than those of 1990, returns will fall below market prices by about 25 percent even if the relatively high projected market prices are realized; if both prices and yields are substantially lower than projected, returns could decline to 30 to 40 percent below production cost.

A major issue for cotton producers is the extent of damage caused by chemical pesticides to the ecosystem, and whether more effective pest control methods can be developed. In recent years, chemical applications have grown very rapidly and some producers reported that they used more than 20 applications each year. In addition, there are widespread concerns that chemical residues in groundwater are increasing to potentially dangerous levels in cotton producing areas as a result of these heavy chemical applications.

The reason such heavy applications are used is that lower levels of use do not appear to provide the necessary levels of pest control. In many cases, serious levels of crop damage are occurring in spite of chemical use. However, officials of the Comision Nacional de Algodon indicate that integrated pest management systems using much lower levels of chemicals have been tested successfully and will be used on growing amounts of area in the near future. The major challenge is how to transfer this technology successfully to other growers, a process that is likely to take time. Graphs III-8 and III-9 indicate that DRC's improve to the extent that agricultural chemical costs are reduced.

⁹ Comision Nacional del Algodon, "cost of production estimates for 1990-91."

Table III-11

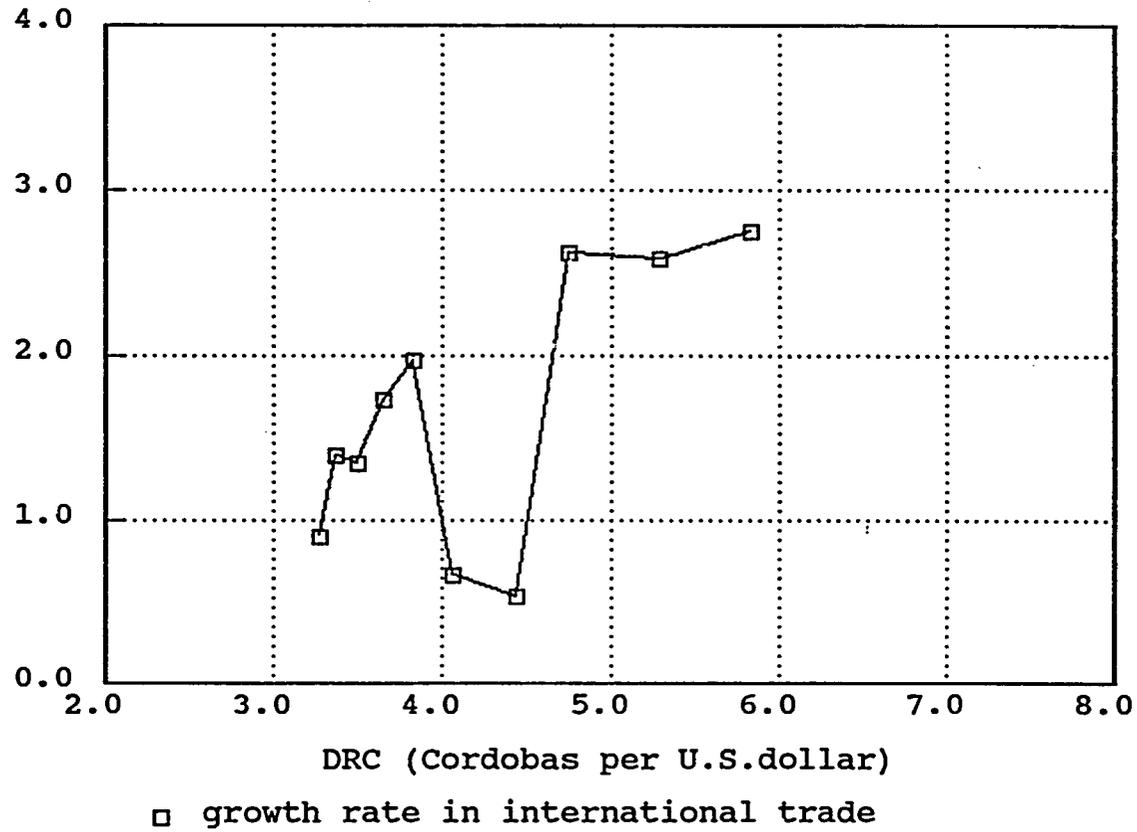
COTTON COSTS AND RETURNS

<u>Returns</u>	<u>qq/mz</u>	<u>Price</u>	<u>Value/mz</u>	<u>Value/mz</u>	<u>Implied Yield/ Field Weight</u>
yield		0.0			
seed	17.5	27.0	472.5	472.5 mz	36.5
lint	12.77	370.0	4724.9	4724.9 ha	52.2
Total			5197.4	5197.4 mt/ha	2.4

<u>Cost per mz</u>	<u>C\$/mz</u>	<u>Share</u>	<u>Return at National Average Yield</u>
Land	200	3.9	
Services	238.82	4.6 return	3898.05
Labor	653.95	12.6 net	-1293.56
Interest	192.64	3.7	
sub	1285.41	24.8 ret/cost	75.1
Seed	58	1.1	
Fert	259.44	5.0	
Herbicides	82.83	1.6	
Biologicos	349.65	6.7	
Other Chem	1312.88	25.3	
Machinery	545.25	10.5	
Air Applications	415\6.25	8.0	
Input Transport	6.16	0.1	
sub	3030.73	58.4	
Subtotal	4316.14	83.1	
Tax/mktg/transport	875.47	16.9	
Total Cost	5191.61	100.0	
Return	5197.4		
Net	5.79		

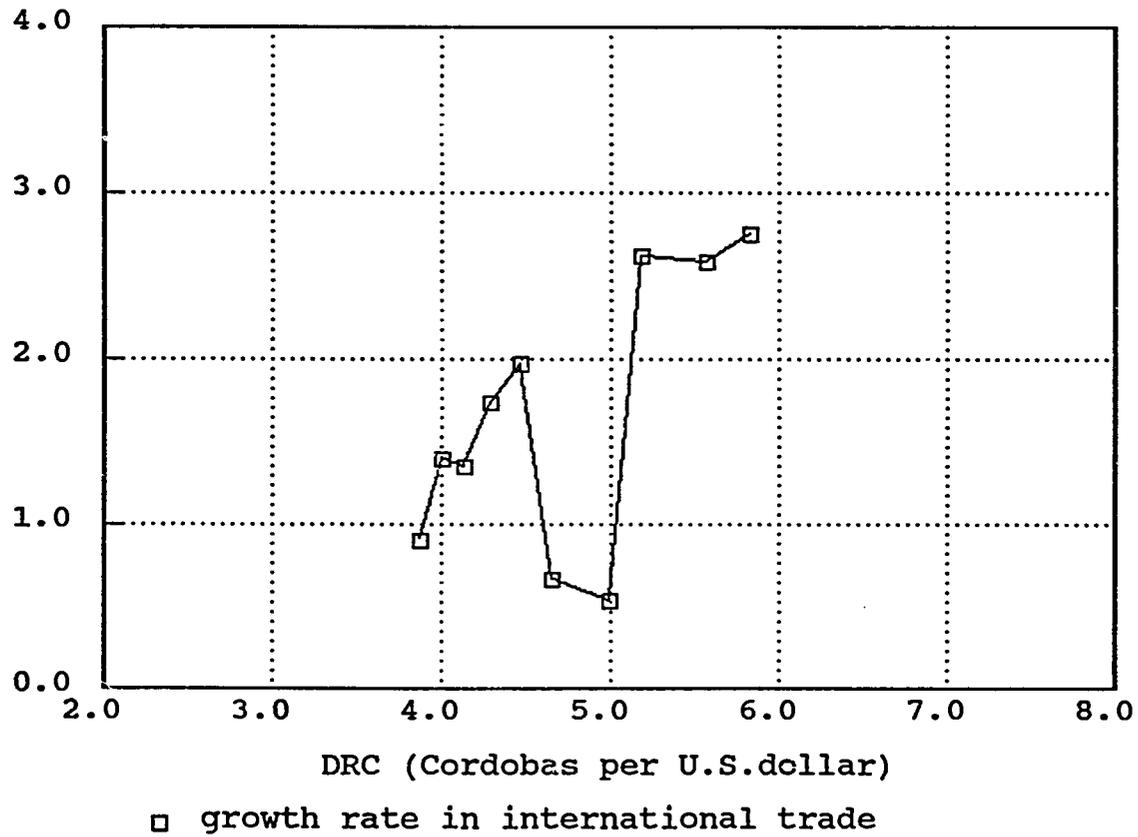
Graph III-8

Attractiveness-Competitiveness Matrix: Cotton
Assuming 75 Percent Reduction in Ag Chem Costs
5 year moving average (%)



Graph III-9

Attractiveness-Competitiveness Matrix: Cotton
Assuming 50 Percent Reduction in Ag Chem Costs
5 year moving average (%)



3. Outlook

Cotton production has declined steadily during the 1980s, from 221,000 mt in 1980 to less than 85,000 mt in 1990 (an average decrease of nearly 11 percent annually). The reduction has come from both area and yield declines, with most of the reduction due to smaller area. In the early 1980s, cotton yields averaged nearly 2.3 mt/ha (2.285 for 1980-84) and both planted area and production was increasing rapidly. However, after 1983 yields began declining steadily and have averaged 1.76 mt/ha for the 1987-90 period. Producers report that much of the yield declines have come from the inability to control pests and rapidly increasing costs of chemical pest controls.

Cotton production in Nicaragua depends both on export markets for lint and on imports of large amounts of inputs (including seed, fertilizers, pesticides, herbicides and sophisticated machinery including crop-spraying airplanes used to apply pesticides. And, the outlook for cotton production depends both on plans by competitors (and world price expectations) and the competitive position of Nicaraguan producers.

Costs of these production inputs for cotton have continually been subsidized by the overvalued exchange rate, especially through 1987. When the exchange rate began to fall rapidly in 1988, import costs increased rapidly. These cost increases were partially offset by the hard currency sales of cotton lint, but since most cotton seed sales are in cordobas, seed has provided a declining share of cotton revenues, a trend that has increased cost pressure on the industry.

In the current crop year, many producers report that they expect to lose money on the crop in spite of the official optimism regarding yields and prices. The GON would like to see cotton area increase so that export earnings could be expanded, and has announced that cotton export licenses will be granted to the private sector, as well as to ENAL in order to increase competition for producers' cotton and reduce marketing spreads between world and farm price levels. However, weather has been dry, and the amount of credit available for this year's crop is relatively small. Producers estimate that between 35,000 and 40,000 mz will be planted this year, substantially lower than the 64,083 harvested in 1990/91.

At the current time, most producers feel the outlook for cotton is bleak. Many believe that the continual production of cotton (and other highly intensive crops) has led to extensive deforestation and damage to the region's water retention capacity, the subsoil moisture, and has changed weather and rainfall patterns. They are concerned about the steadily increasing input use (especially pesticides) and the impact of those products on the soil and water. And, they are concerned about the long-run economics of the outlook for cotton, with its heavy demands on the soil, growing dependance on imported inputs, and relatively weak export market prospects as Nicaraguan producers face increasing pressure from world market competitors.

In spite of concerns about the future for cotton production in Nicaragua, the Comision Nacional de Algodon reports that new management and production techniques have promise to both increase yields and reduce costs very significantly, so that production cost per qq declines sharply. They project that these advances will stimulate production growth so that within four to five years, cotton area will increase to more than 100,000 ha, levels more than twice as great as the 35,000 ha to 40,000 ha likely to be harvested this year.

In spite of the Comission's optimism (and in spite of the GON's need to develop exports to earn foreign exchange), the prospects of cotton production expanding rapidly seem small, for several reasons:

- Longer term world price prospects for cotton appear much weaker than the Comission expects. Rather than the levels of last May (as suggested by the Comission's cost and returns projections), U.S. spot prices may be 15 to 20 percent lower this year (or more) depending on production by competing exporters, and worldwide consumption growth.
- The Comission's projections depend on effective reduction of production costs, based on new technologies and management techniques. While these would be expected to be especially attractive to producers (because of their cost saving potential), they also are complicated and difficult to manage. And, they may simply be less effective in broad field use than they were in previous tests. Experience indicates that technology adoption is slow and difficult, especially for techniques that are complex and which require close tolerances and rigid schedules.
- The transfer of new cotton production technologies may be made more difficult by the fact that producer numbers are now greater than they were formerly. Some of the smaller producers may have less management expertise and experience and be less able to use new technologies than those managing larger operations.

At the same time, there is some prospect that larger producers will continue to find cotton production unattractive in spite of new cost reducing technologies because of both marginal economic prospects and the current, somewhat bleak world market outlook.

- Thus, the combination of expected weak world cotton prices and the difficulty of reducing production costs implies continuing declines in cotton production in Nicaragua. Cotton area is projected to be steady through the 1990s at about 35,000 ha with yields and production declining an average of just over 1 percent annually.

C. BANANA SYSTEM

Even though banana exports are still modest, bananas have been selected as one of the profiled commodity groups because of the high level of optimism in Nicaragua and abroad regarding the potential for growth. Internationally, as will be further described below, markets are expanding and prices are firm, especially compared with most other tropical commodities. Nicaragua is currently able to profitably sell all of its production, despite internal structural difficulties, an unfavorable exchange rate, and comparatively low quality.

The first section of the following profile describes the world market situation and Nicaragua's position in the market. This is followed by an analysis of the present and emerging structure of the banana industry in Nicaragua, including an assessment of constraints and opportunities for future growth.

1. World Market Situation

Consumption and Imports

Total world imports of bananas, in terms of volume, increased 27 percent between 1980 and 1990 to 8.6 million tons. (Table III-12) However, growth has been more pronounced in recent years, averaging 4.5 percent annually since 1985. Developed country imports represent 92 percent of the total and have expanded 32 percent between 1980-1990 and 21 percent between 1985-1990.

The European Community accounts for about 40 percent of the developed country market with Germany alone representing 14 percent. The U.S. share of the market is about 36 percent, down from about 42 percent in 1985. U.S. imports have been relatively steady while the EEC market has expanded 38 percent between 1985-1990. Germany, the U.K. and Italy have accounted for most of the growth. In the case of the latter two countries, increased quotas for countries outside the ACP or former colonies are responsible. Japan represents the third largest single market with a 9 percent share of the developed country market. The Japanese market has not shown much growth over the past five years.

Smaller, but rapidly growing markets include: the Scandinavian countries, Austria, Yugoslavia and Saudi Arabia.

Higher demand can largely be attributed to increased consumption/ imports per capita. (Table III-13) Imports by developed nations have increased on a per capita basis from 5.4 kg. in 1980 to 5.7 in 1985 and 6.7 in 1990. Growth has been most pronounced in the EEC and other European countries. Per capita import levels are highest in Austria (17.1), Sweden (16.7), Germany (14.1) and Finland (14.1). In contrast, U.S. imports

Table III-12

BANANA IMPORTS

	1980	1985	1986	1987	1988	1989	1990
WORLD	6781.7	7034.6	7280.0	7621.5	7750.1	8160.0	2209.8
United States	2147.1	2772.0	2815.7	2780.5	2750.0	2760.0	2850.0
Canada	245.8	285.0	300.6	324.4	229.7	322.3	340.8
EEC	2360.6	2335.5	2467.0	2582.3	2753.7	2957.7	3230.5
Belgium-Lux	81.0	76.8	76.3	94.0	102.3	87.7	85.0
France	446.0	425.7	453.6	445.2	454.8	455.0	458.7
Germany,	610.3	649.4	677.0	717.7	807.0	901.0	1117.1
Italy	300.7	307.2	339.2	362.8	380.5	400.0	428.8
Netherlands	107.2	104.1	109.7	119.1	126.5	124.0	125.0
Spain	405.4	363.0	356.5	360.0	360.0	382.0	382.0
United Kingdom	328.4	323.6	343.0	359.4	388.0	433.6	469.9
Other Western Europe	356.4	333.8	370.0	414.4	461.7	518.5	592.7
Austria	76.9	83.6	91.6	95.6	110.2	121.5	130.0
Finland	39.1	47.9	50.6	57.0	59.2	71.3	70.0
Sweden	70.0	86.8	96.1	126.5	126.5	137.5	142.8
Switzerland	63.1	60.5	63.3	69.1	69.1	73.0	75.8
Yugoslavia	72.1	13.0	23.2	45.2	45.2	59.0	120.0
Eastern Europe	188.8	151.4	86.2	119.3	159.3	184.2	160.5
Czechoslovakia	49.6	55.0	55.6	54.2	56.7	56.4	31.3
Hungary	13.1	13.4	12.8	14.9	22.5	46.5	34.2
USSR	56.3	69.9	9.9	43.1	66.0	70.0	70.0
Japan	726.1	680.0	764.6	774.8	760.4	773.7	757.5
New Zealand	36.5	53.9	37.5	3.9	46.5	49.3	61.8
Latin America	439.6	187.4	217.0	195.8	200.2	206.6	210.0
El Salvador	49.6	29.0	23.8	25.0	25.0	25.0	25.0
Argentina	195.2	94.7	128.6	100.0	90.0	90.0	90.0
Near East	197.8	123.3	100.1	236.8	247.1	242.6	289.0
Saudi Arabia	135.3	85.2	58.1	163.2	171.8	156.3	169.0
Far East	46.0	60.0	67.5	74.4	76.0	82.3	88.0
Africa	17.0	11.4	8.8	14.9	15.5	12.8	13.0
China	20.0	40.0	45.0	50.0	50.0	50.0	50.0

Table III-13

BANANASPer Capita Imports
(kg per capita)

	1980	1985	1986	1987	1988	1989	1990
WORLD	2.9	2.9	2.9	2.9	3.0	3.1	3.2
Canada	10.2	11.3	11.8	12.7	8.9	12.3	12.9
United States	9.4	11.6	11.7	11.4	11.2	11.1	11.4
EEC	7.2	7.0	7.5	7.6	8.1	8.6	9.4
Belgium-Luxembourg	7.9	7.5	7.5	9.2	10.0	8.5	8.3
France	8.3	7.7	8.2	8.0	8.1	8.1	8.1
Germany	8.6	9.6	10.4	9.2	10.3	11.5	14.1
Italy	5.3	5.4	5.9	6.3	6.6	7.0	7.5
Netherlands	7.6	7.2	7.5	8.1	8.6	8.4	8.4
Spain	10.8	9.4	9.2	9.3	9.2	9.8	9.7
Other Western Europe	6.6	6.1	6.7	7.4	8.3	9.2	10.5
Austria	10.2	11.1	12.1	12.6	14.5	16.0	17.1
Finland	8.2	9.8	10.3	11.6	12.0	14.4	14.1
Sweden	8.4	10.4	11.5	13.1	15.0	16.2	16.7
Switzerland	10.0	9.4	9.7	10.1	10.5	11.0	11.4
Yugoslavia	3.2	0.6	1.0	1.6	1.9	2.5	5.0
Eastern Europe	0.7	0.6	0.3	0.3	0.4	0.5	0.4
Czechoslovakia	3.2	3.5	3.6	3.5	3.6	3.6	2.0
Hungary	1.2	1.3	1.2	1.4	2.1	4.4	3.2
USSR	0.2	0.3	-	0.2	0.2	0.2	0.2
Japan	6.2	5.6	6.3	6.3	6.2	6.3	6.1
Latin America	9.4	3.7	4.3	3.8	3.8	3.9	3.9
El Salvador	6.9	3.1	4.2	5.1	5.0	4.9	4.8
Argentina	13.8	2.7	2.6	3.2	2.9	2.8	2.8
Near East	3.0	1.8	1.6	2.3	2.4	2.3	2.6
Saudi Arabia	14.4	7.3	4.8	13.0	13.1	11.5	1.7
Far East	1.0	1.2	1.4	1.5	1.5	1.6	1.7
Africa	0.3	0.2	0.1	0.2	0.2	0.2	0.2
New Zealand	11.7	16.6	11.5	16.3	14.0	14.8	18.2

per capita were about 11.4 in 1990. At the low end, Eastern Europe and the USSR were importing only 0.4 kg. per person in 1990.

Since the EEC average is about 9.4 kg. per person, this market seems to hold potential for further growth. Increased demand for off-season fruit is the primary driving force. Other factors include a decrease in price relative to competing fruits and more effective marketing by distributors. However, demand in several countries has been restrained by high tariffs and/or quantitative restrictions intended to protect domestic production (mostly in the Canary Islands and French Caribbean) and former colonies and possessions (British Commonwealth and ACP countries). In 1990, 42 percent of the EEC market was supplied from these sources, with 58 percent supplied through open market imports.

Thus, continued growth of imports in the EEC will be heavily influenced by the level of protection offered after 1992. Since some countries like Germany have open markets, while others are highly protected (France, U.K., Italy and Spain) the unified market will require a consistent approach. While there is no indication as to the policy direction to be taken, two recent studies (Borrel & Yang, 1990; and Fitzpatrick and Associates, 1990) suggest that free trade would increase imports from third country suppliers by 12-26 percent while raising world prices 2-6 percent. Realistically, however, at least some level of continued protection can be expected. On the other hand, recent investments by U.K. and German banana companies in Central America, suggest that these firms are preparing themselves for a more open market. Furthermore, both the U.K. and Italy have accepted some liberalization of their policies.

Exports

The principal banana exporters (in terms of volume) are Ecuador, Costa Rica, Colombia, Honduras and the Philippines with 24 percent, 15 percent, 11 percent, 10 percent, and 9 percent of the 9 million metric tons exported in 1990. The countries that have increased their market shares most dramatically are Costa Rica and Ecuador followed by Colombia. The Union of Banana Producing Countries, of which Nicaragua is a member, accounts for 49 percent of total exports, but has not gained market share over the past decade, despite the growth in Costa Rica. The Caribbean exporters (all protected by special arrangements) have increased their market share from 3 percent in 1980 to 7 percent in 1990. This, together with the exports from the Canary Islands and Africa, is expected to be up for grabs if the EEC market is liberalized.

Supply/Demand Balance and Prices

While import growth has been relatively strong, supply has expanded moderately due to strikes and hurricanes in key producing countries. However, export availabilities

Table III-14

BANANA EXPORTS

	1980	1985	1986	1987	1988	1989	1990
WORLD	6904.3	7136.6	7514.8	7974.6	7882.0	8167.7	9026.0
Caribbean	230.8	438.8	537.0	523.5	614.1	579.6	630.2
Spain	405.4	400.0	400.0	400.0	400.0	400.0	400.0
UPEB Countries	3427.0	3545.0	3538.3	4253.3	3863.1	4067.6	4380.1
Colombia	691.6	775.3	857.0	912.5	921.7	877.2	990.8
Costa Rica	887.7	803.6	882.3	1060.4	1026.7	1224.8	1344.4
Guatemala	352.0	318.6	331.2	472.8	309.0	390.6	360.0
Honduras	866.5	868.4	800.0	1051.9	871.0	818.7	864.0
Nicaragua	110.0	90.0	78.4	72.3	61.0	70.0	72.0
Panama	504.2	685.0	585.9	679.7	669.8	681.8	738.0
Other Latin America	1451.8	1402.2	1583.3	1608.6	1762.0	1878.6	2395.0
Ecuador	1318.2	1207.9	1365.9	1381.2	1534.8	1648.9	2160.0
Philippines	922.7	789.3	855.7	775.0	866.8	851.0	850.0
Far East	958.5	830.5	895.5	813.0	900.8	884.7	882.0
Africa	221.9	199.8	198.8	198.8	186.2	227.9	227.9

have been increasing at about 7 percent annually over the past two years as these difficulties are overcome and new plantations come on stream.

The strong market is reflected in high import prices. (Table III-15) In the U.S. import prices averaged a record \$.57 per kilo in 1990, up 54 percent from \$.37 in 1985. Retail prices have risen a more modest 26 percent from \$.81 in 1985 to \$1.02 in 1990. Prices in Germany have consistently been higher (in dollar terms). In 1985, import prices averaged \$.46 per kilo, but by 1990 the price reached \$.75, or 33 percent above the U.S. price. Part, but not all of this difference can be explained by higher transportation costs to Europe.

The potential liberalization of the banana market in Europe, continued strength in all developed markets and the large potential demand in Central and Eastern Europe suggests an optimistic outlook for the banana market over the next few years. Bananas remain the most popular fresh fruit in many countries (accounting for 28 percent of total fresh fruit consumption in the U.S., for example), due to their year around availability and modest seasonal fluctuations in price (compared to other fruits). Much more aggressive marketing of fresh bananas, including brand names and niche markets spurs consumption and helps strengthen prices. Demand for banana pulp for juice blends and other products is also expanding as companies introduce a wide range of new juices and frozen desserts in one of the fastest growing segments of the food market.

Because of positive outlook, both the large fruit companies and independent growers are investing significantly in expanded production. Major projects are underway or planned in most Central American countries, with investment from U.S. and European fruit companies as well as local growers. The possibility of rapidly increasing supply presents the principal threat to prices in the future. However, as competition increases, it is generally agreed that Central America, Ecuador and Colombia have a clear comparative advantage due to their growing conditions. Recent World Bank projections indicate that prices will soften over time as output responds quickly to strong demand. (Graph III-10)

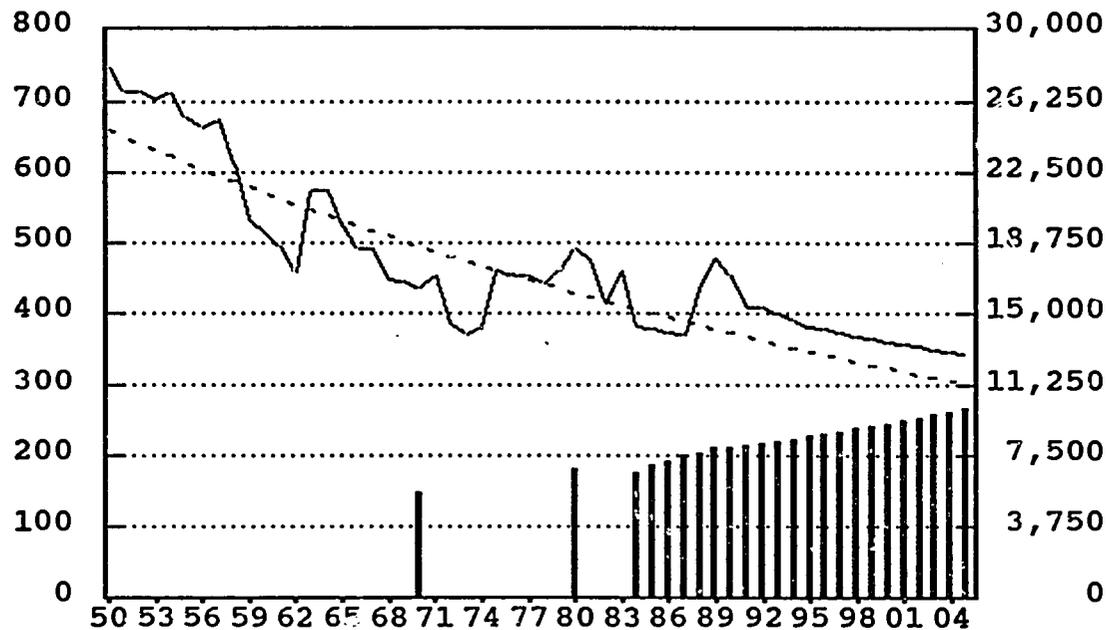
Distribution channels

Most of the fresh bananas sold in the U.S. are marketed directly by the principal fruit companies, each with its own brand name. In addition, some countries such as Colombia, Costa Rica and Ecuador, have developed independent brand names and/or marketing companies. Brokers and distributors are also involved in getting the bananas to the retail level, especially to smaller outlets.

In Europe, distribution varies somewhat by country. However, major fruit companies (including the U.S. multinationals) dominate key markets such as the U.K. and Germany. Brokers, distributors and wholesale markets also play important

Graph III-10

World Banana Market--Volume & Price
Actual & World Bank Projections
1985 dollars per tonne



Year

■ world trade (thousand tonnes)
— price (1985 dollars per tonne)
..... long-term trend

roles in European distribution. Some countries, such as Belgium, Germany and Austria, serve as entry and transshipment points for other European countries. The markup between the import and retail level is now about 80 percent in the U.S. and about 120 percent in Germany. Margins have become narrower in the U.S. while remaining high in Germany.

Nicaragua in the global market

In the context of the world market, Nicaragua is a relatively minor player. In 1990, total production is estimated at about 95,100 metric tons with exports estimated to be about 72,000 tons and valued at \$27.3 million. (Table III-16)) Over the past five years, exports have been relatively constant given no major changes in acreage. Acreage did increase significantly in 1990, and is expected to continue expanding in 1991. However, 1990 production and acreage are still below 1980 levels.

Nicaragua's share of world exports was in 1990 was about 0.8 percent compared to its peak performance in 1978 when it accounted for 1.8 percent share of the world market. Production and exports declined dramatically in the early 1980's (largely due to a hurricane) before recovering in the latter years of the decade.

Until 1980, banana production and marketing was controlled by Standard Fruit. Most of the fruit was destined for the U.S. West Coast. A decree in 1980 gave newly created state enterprises (now just BANANIC) a monopoly on the production and marketing of bananas on the Pacific Coast. Although Standard continued under a management and marketing agreement until 1982, the termination of this agreement combined with the U.S. embargo forced BANANIC to develop new marketing and distribution strategies.

By necessity, Nicaragua had to focus on the European market after the embargo. Although able to sell their bananas in Europe, marketing by the Nicaraguan state companies was hindered by a number of factors including: poor coordination between marketing and production; high shipping costs (largely related to small volumes and the time required to fill ships); dependence on spot markets and brokers/jobbers, and deteriorating product quality (see below).

Since a reorganization in 1988, BANANIC has been quite resourceful in improving its marketing. Despite the end of the U.S. embargo, Europe continues to be the strategic focus. Not only does the European market offer better prices, but it can absorb the lower quality product at good prices. BANANIC has also established a marketing joint venture (B&P International) with the Colombian growers association. This company is registered in the British Virgin Islands, but operates out of Brussels. B&P charters ships and manages the logistics and marketing. By chartering ships, and topping the loads in Costa Rica or Colombia (allowing for immediate shipment), shipping costs have been cut significantly. Weekly shipments are dispatched to Brussels.

Table III-15

COMPARATIVE PRICES FOR BANANAS

(\$/kg.)

	U.S.			GERMANY		
	IMPORT	WHOLESALE	RETAIL	IMPORT	WHOLESALE	RETAIL
<i>1980</i>	.377	.525	.829	.457	.547	.970
<i>1981</i>	.403	.559	.885	.459	.534	.971
<i>1982</i>	.373	.535	.780	.448	.521	.951
<i>1983</i>	.428	.644	.850	.478	.540	.888
<i>1984</i>	.373	.573	.793	.414	.467	.753
<i>1985</i>	.377	.593	.809	.544	.601	.983
<i>1986</i>	.381	.629	.848	.622	.725	1.319
<i>1987</i>	.392	.591	.805	.735	.873	1.631
<i>1988</i>	.476	.639	.922	.601	.702	1.38
<i>1989</i>	.509	.700	.989	.590	.697	1.39
<i>1990</i>	.565	.733	1.021	.749	.856	1.663

Source: FAO

Table III-16

NICARAGUA'S BANANA PRODUCTION AND EXPORTS

YEAR	PRODUCTION (Metric Tons) ¹	EXPORTS ²		ACRES IN PRODUCTION
		(Tons)	(\$MM)	
1980	104,955	110,100	N/A	6,722
1981	89,925	94,100	N/A	6,747
1982	41,510	43,400	N/A	6,573
1983	78,050	76,000	N/A	5,568
1984	75,800	82,900	N/A	5,963
1985	81,295	90,000	N/A	5,877
1986	78,775	78,400	N/A	5,894
1987	75,590	72,300	N/A	5,450
1988	68,300	61,000	N/A	5,458
1989	80,710	70,000	N/A	5,173
1990	95,100	72,000	N/A	6,122

¹ BANANIC

² FAO. There are obvious inconsistencies between the two data sets.

Although BANANIC continues to handle virtually all marketing of bananas, it no longer has a monopoly on either production or marketing (although the decree giving it sole control over exploitation of the Pacific banana growing region is still in force). However, the new environment opens the door for U.S. or other foreign firms to invest in banana plantations and/or marketing companies. It is hoped that U.S. companies will reinvest in Nicaragua and supply the U.S. market, while BANANIC focuses on Europe. BANANIC does not believe it can compete effectively in the U.S. market given its cost structure, quality level and lack of marketing channels.

2. Structure of The Nicaraguan Banana Industry

Central role of BANANIC

The dominating role of BANANIC, which has already been referred to, is further depicted in Figure III-11. Under Decree 60B of 1980, this state entity was given sole responsibility for exploiting banana production on the Pacific coast (Leon and Chinandega), leasing land for banana production and entering into any type of marketing or technical assistance agreements. Landowners in these departments (the only banana growing regions) have had no choice but to lease their land to the state enterprise. However, with one notable exception (since reversed), land was not expropriated. Furthermore, the practice of leasing land from private owners for a fixed price per box of bananas was started by Standard Fruit, with the principal differences being that the owners had a choice. BANANIC has paid about \$0.15 per box for leasing the land.

Banana production is currently either directly under BANANIC management, or with the new administration, being turned over to private managers. Since the decree creating a state monopoly is still in force, BANANIC "leases" land from its owners and then contracts them to manage the plantations. However, BANANIC is still directly administering most of the production.

Since its reorganization in 1988, BANANIC has increasingly been run as a business enterprise. The Board of Directors includes significant private representation while the Executive President is widely regarded to be doing a professional job. Measures taken to date, to improve operations, include the following:

- Direct importation of equipment, agricultural chemicals and packing materials. This has been made possible by two key policy decisions: authority for BANANIC to retain its hard currency earnings (and thus be able to pay for imports); and the liberalization of the state import monopoly. In addition to significant savings, BANANIC is able to obtain credit terms of 60-180 days.

Figure III-11

CURRENT STRUCTURE OF BANANA SYSTEM

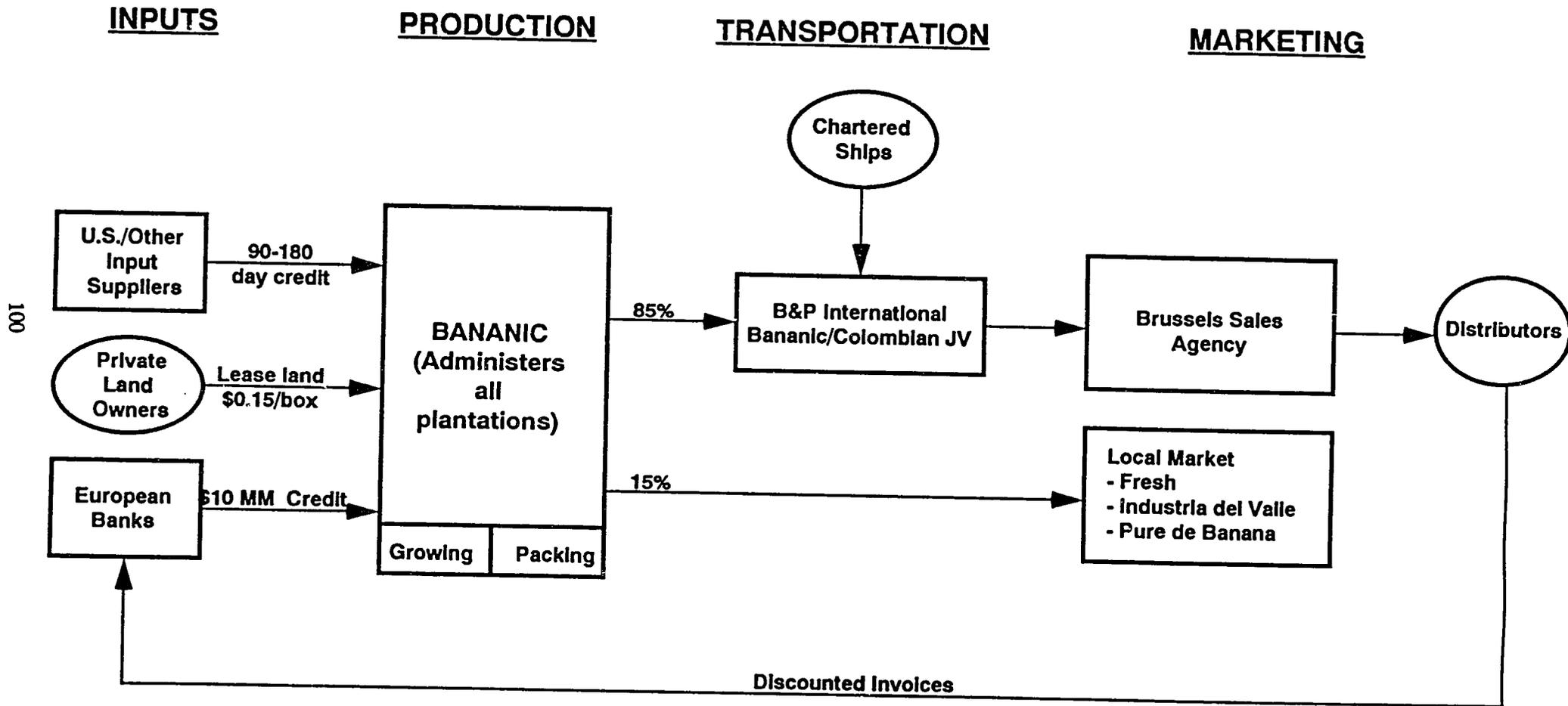
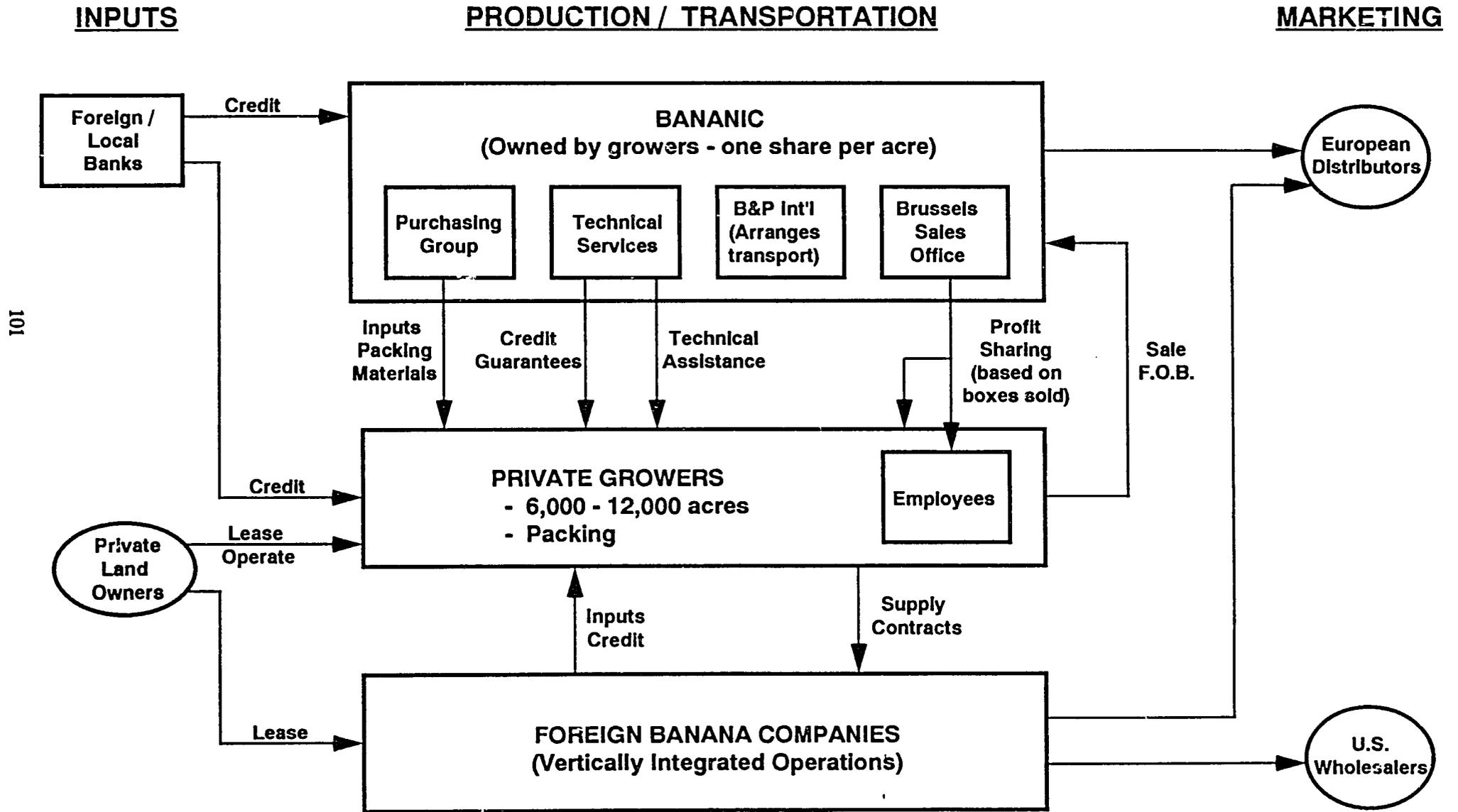


Figure III-12

LIKELY FUTURE STRUCTURE OF BANANA SYSTEM



- Negotiation of a \$10 million line of credit with a European bank by discounting the company's sales contracts. BANANIC is virtually independent of the domestic banking system.
- Contracting of Costa Rican advisors and increasing the role of private managers to help improve productivity on the plantations. Yields declined 15 percent from about 15.6 tons per acre in 1980 to 13.8 in 1985 and 12.5 in 1988. By 1990, yields rebounded to 15.5 tons (according to BANANIC statistics).
- Introduction of management systems to BANANIC operations, including cost accounting for individual plantations. It is reported that plantations directly managed by BANANIC are now break-even operations, a significant improvement over previous performance. Overstaffing, difficult labor relations, poor agronomic practices and a lack of accountability have been the principal problems.
- Restructuring of the shipping and marketing operations. As described above, one of the most important steps taken by BANANIC has been to change its approach to shipping and marketing. The result has been lower shipping costs and higher revenues.

Likely changes in industry structure

The emerging structure of the banana system is presented in the Figure III-12. The most striking feature is that BANANIC will continue to play a central role, albeit as a private entity. Although the details on how BANANIC will be privatized are not finalized, management fully expects the process to be completed within 1991. The most likely scenario involves the issuing of shares, with each acre under production granted one share.

The principal change in BANANIC's role is that it will primarily become a service and marketing organization, and leave the management of the banana production to private growers. The continued operation of a private BANANIC is reportedly strongly supported by most private landowners. Possible service functions are expected to include:

- Technical assistance/supervision and/or administration of plantations (to the extent or until private managers take over);
- Volume purchasing of inputs on behalf of all growers;
- Packing and/or provision of packing materials (plastic and cartons);

- Chartering of ships, marketing and export logistics;
- Credit guarantees for growers (based on sales contracts).

The likely scenario is for BANANIC to charge fees for its services. Profits will be distributed on the basis of the number of boxes sold by each shareholder (rather than the number of shares), with some yet to be determined share going to the workers.

3. Outlook and Issues

The potential in Nicaragua for expansion of bananas is significant. It is generally agreed that 3,000 hectares of land are available in the prime growing areas of the Pacific. Other areas towards the Atlantic are also believed to be suitable, but will require more infrastructure to develop. Thus, banana production could be more than doubled in the next five years, contributing about \$30 million in exports.

Most individuals associated with the banana business in Nicaragua believe it to be a profitable venture. The assumptions are that the European market will absorb anything (in terms of quantity and quality) that Nicaragua can produce, and that despite relatively high shipping costs to Europe, the business is (and will continue to be) profitable. On the other hand, the conventional assumption is that Nicaraguan growers would have a difficult time competing on price and quality in the U.S. market.

A recent (April 1991) feasibility study prepared by BANANIC estimates operating costs on a new plantation to be as indicated in Table III-17. Using realistic yields and cost parameters, gross operating costs (excluding interest on working capital loans, interest and principal on the initial investment, and shipping to market) are estimated at \$3.44 per 40 pound box. Sales price F.O.B. is estimated at an average of \$4.75 (low compared to current prices). From the resulting revenues would be deducted repayment of the initial investment (\$16,500 per hectare), estimated at an average \$1.19 per box over the first seven years, assuming a 9 percent interest rate (which is unrealistically low, even if foreign loans are obtained). Furthermore, interest would have to be paid on an estimated working capital requirement of \$223,000 (about \$0.04 per box). Thus, total costs F.O.B would be about \$4.92 over the first seven years and \$3.48 thereafter. The BANANIC feasibility study estimates an internal rate of return of 23 percent at a 15 percent discount rate.

The general rule of thumb for the economics of bananas, utilized by the leading private grower is as follows (on a per box basis):

Table III-17

TYPICAL BANANA PLANTATION**Average Operating Costs (excluding finance)**

1) <u>Agricultural Costs</u>	<u>2,983.00</u>	1.038
Labor	825.00	
Materials	1,483.00	
Services	675.00	
2) <u>Harvest</u>	<u>271.10</u>	.094
Labor	185.90	
Materials	85.20	
3) <u>Packing</u>	<u>3,698.50</u>	1.287
Labor	483.10	
Materials	3,164.00	
Tools	37.00	
Services	14.40	
4) <u>General Plantation Costs</u>	<u>903.10</u>	.314
Salaries	338.70	
Food	360.10	
Maintenance	204.30	
5) <u>Administrative Costs</u>	<u>740.70</u>	.258
Salaries	234.10	
Other	506.60	
6) <u>Transport</u>	344.80	.120
7) <u>Loading/Ship</u>	948.00	.330
TOTAL FOB	<u>9,889.20</u>	<u>3.442</u>

Source: BANANIC

Import price, Brussels	\$11.00
Transport, insurance	4.00
BANANIC markup	1.00
FOB price	6.00
Production cost (incl. amortization)	4.00
Profit to grower	2.00

Despite these attractive figures, the profitability/competitiveness of the banana business in Nicaragua is fragile. First of all, it is predicated upon continued growth in demand and high prices. Even if demand continues to grow, other Central American countries, as well as other tropical regions hungry for jobs and foreign exchange, are aware of the opportunities in the banana market. Furthermore, U.S., U.K. and German companies are planning large investments in new production. Since new plantations can begin to produce quickly, major new investments can rapidly lead to a softening of the market. Another potential weakness is the Nicaraguan assumption that European markets will absorb poor quality product at premium prices. As the market matures, consumers are likely to become more sophisticated and demand a higher quality product. As with other products, the market will segment based on quality and price. In this environment, low cost (and high quality) producers will emerge dominant. However, Nicaragua is poorly prepared for this type of competition.

In summary, based on the quality of growing conditions, Nicaragua should be an excellent location for investment in bananas, while at least in the short-medium term, expanding markets should provide an outlet for increased production. However, competition will inevitably become more intense, and Nicaragua will have to be prepared to compete. This will require both suitable macro economic policies (especially involving exchange rates and clear rules of the game for investors) and a microeconomic emphasis on improving productivity and reducing unit costs.

D. MELON SYSTEM

1. U.S. Market Situation

Consumption

U.S. market volume for honeydews increased 8.5 percent a year between 1980 and 1988, while *per capita* consumption grew at about 7.5 percent.

<u>Year</u>	<u>Honeydews¹ Per capita (lbs)</u>	<u>Total (million lbs)</u>
1980	1.3	296
1981	1.5	345
1982	1.8	418
1983	1.7	400
1984	1.8	427
1985	2.0	478
1986	2.4	580
1987	2.2	537
1988	2.3	567

¹ The comparable data for cantaloups were suspended in the early 1980s.

Imports

California and Texas produce honeydews from June to September and cantaloups from May to July. Non-U.S. producers supply various types of melons when U.S. products are not available, mostly November to April. U.S. imports of *cantaloups* grew at an average annual rate of 18 percent between 1980 and 1989, and at 22 percent between 1987 and 1989. Mexico is the major offshore supplier. Honduras and Guatemala are the leading Central American shippers. (Table III-18 and Graphs III-13 and III-14)

Prices

Melon prices generally move in the opposite direction to supply, peaking during the "winter" months (December through March), and bottoming out in September, following the maximum U.S. harvest month. The wholesale prices in Chicago and New York indicate minor differences between U.S. and foreign origin melons, slightly favoring offshore supplies. The northern U.S. prices naturally reflect the logistical costs of moving melons from the farm to market; hence, the ex-farm prices are much lower than those shown. (Graphs III-15-18)

Table III-18

<u>Year</u>	<u>U.S. Imports (1,000 cwt)</u>			
	<u>Cantaloups</u>		<u>Other melons</u>	
	<u>All sources</u>	<u>Central America</u>	<u>All sources</u>	<u>Central America</u>
1980	1,800	36	182	70
1981	1,491	23	229	120
1982	1,966	25	265	113
1983	1,682	43	323	141
1984	2,478	44	560	277
1985	2,242	161	601	236
1986	3,155	298	935	511
1987	3,106	469	904	727
1988	3,492	737	767	543
1989	4,629	1,407	1,105	821

The U.S. consumer

During the 1980s, there has been a general trend for consumers to pay a premium for fresh products: fish and meat, as well as produce. Much attention -- consumer and regulatory -- has been focused on the preservation methods of fresh food, both to ensure that products reach consumers "fresh", and also that unacceptable chemicals or levels of chemicals, have not been used to preserve freshness. This has placed a great onus on producers and intermediaries to meet ever more exacting standards, and added cost for producers in areas without access to excellent control, preservation, and testing technology.

Consumer concern about the quality of produce from developing countries has increased, as has frontier vigilance by U.S. authorities. Exports from Central America have experienced difficulties, particularly with the use of agricultural chemicals not registered in the U.S., and with excessive residues of permitted chemicals.

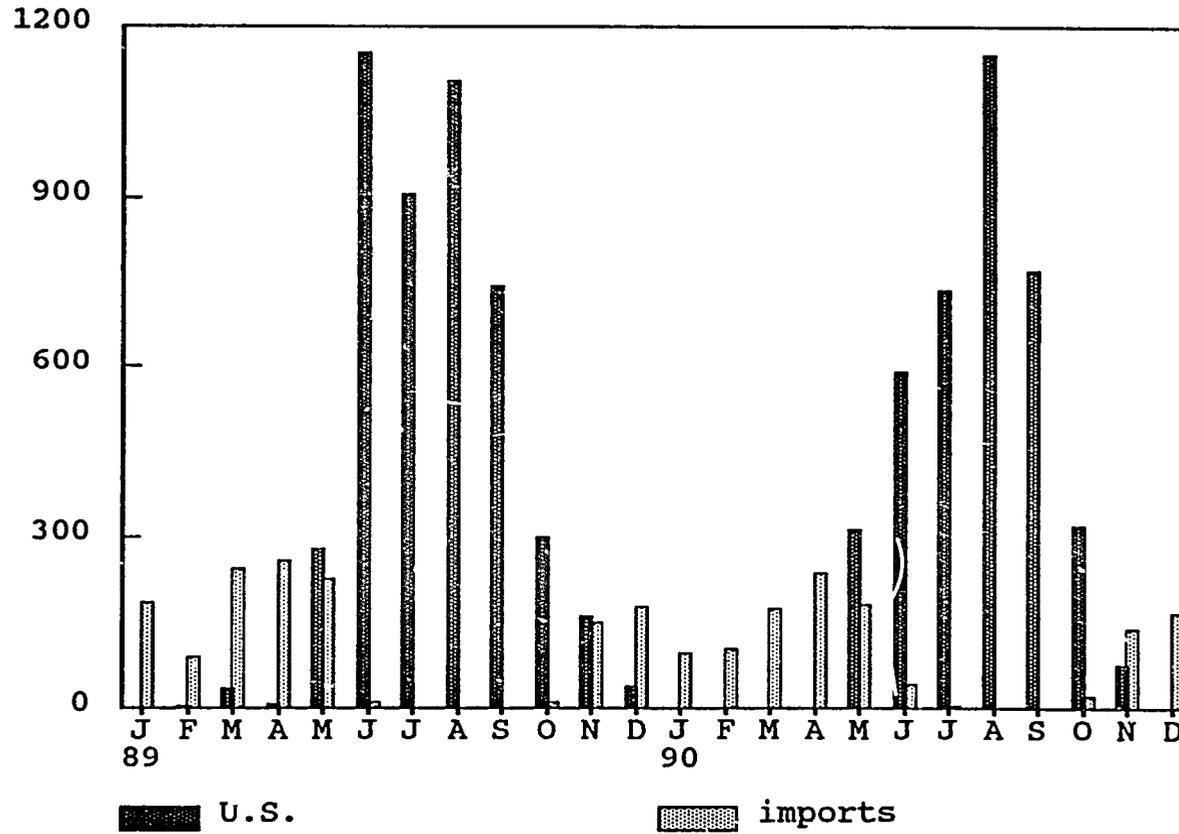
Distribution

Melon retailers have primarily been supermarkets that have paid special attention to their produce sections.

There are two intermediaries between the supermarket and the exporter: the "buyer's broker" and the "receiver".

Honeydews
Shipments by Origin

k cwt

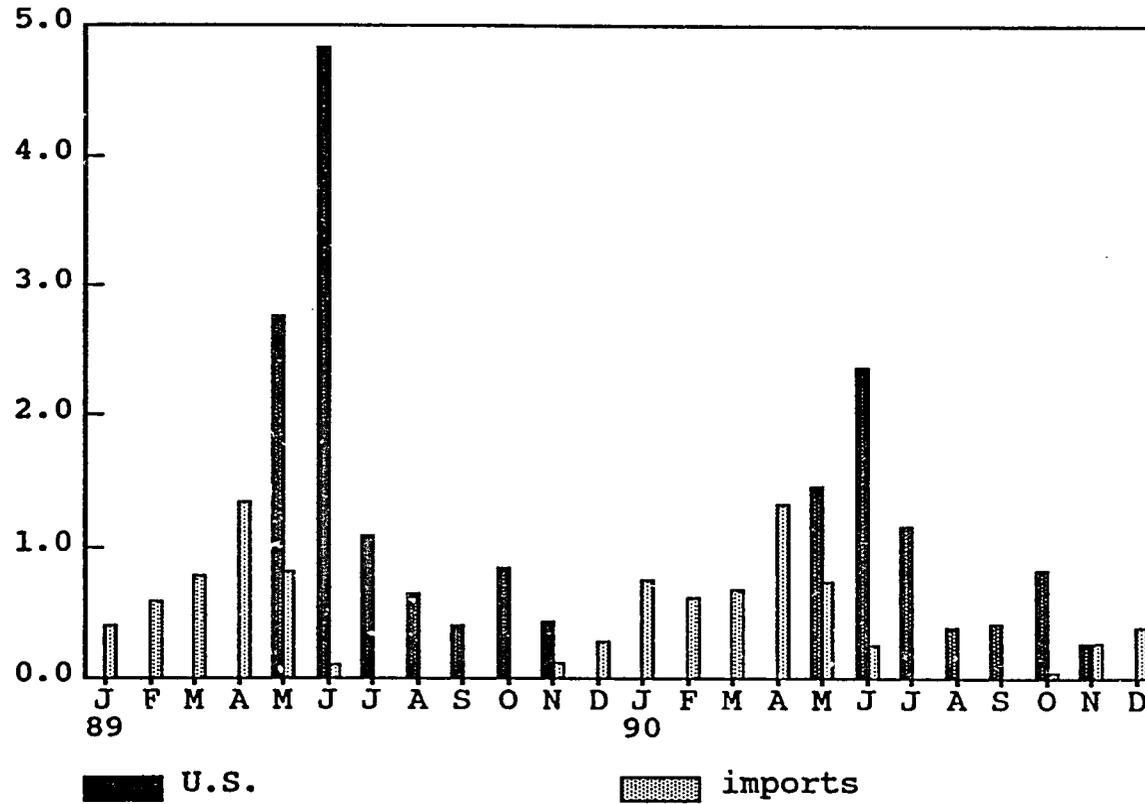


Graph III-14

Cantaloupes
Shipments by Origin

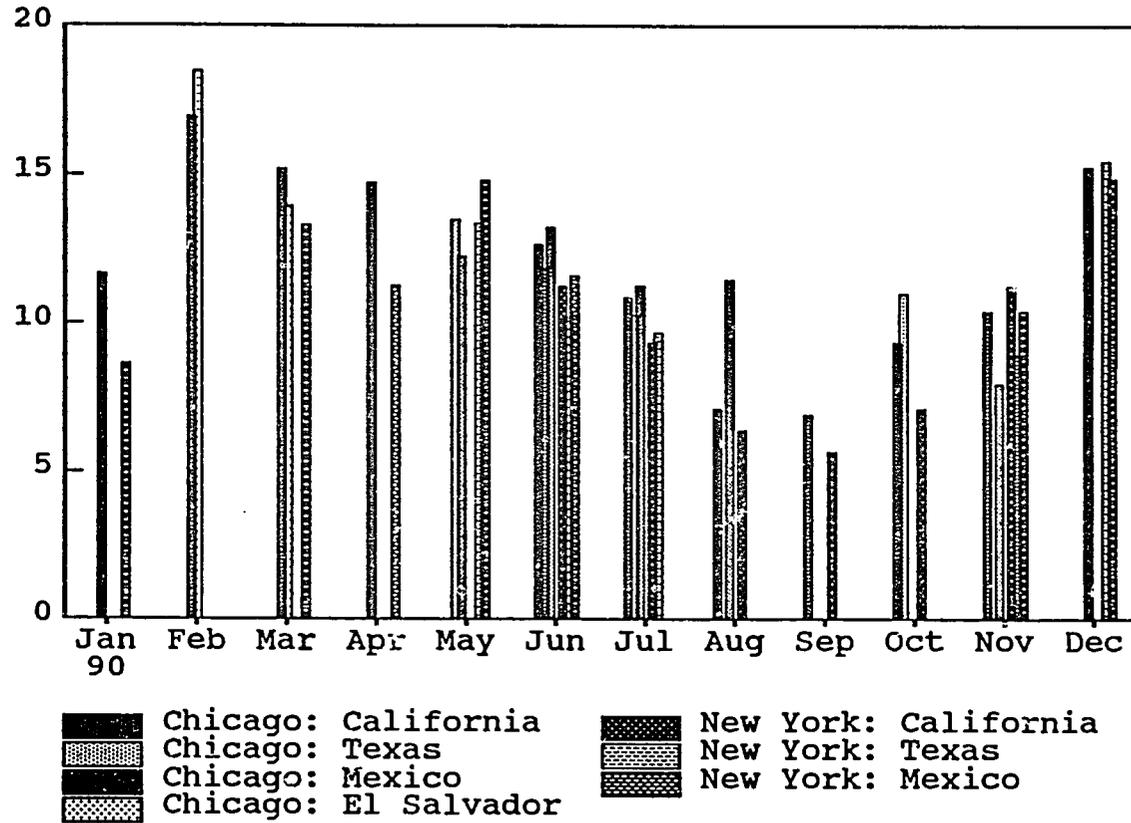
k cwt

Thousands



Honeydews
Prices at New York & Chicago

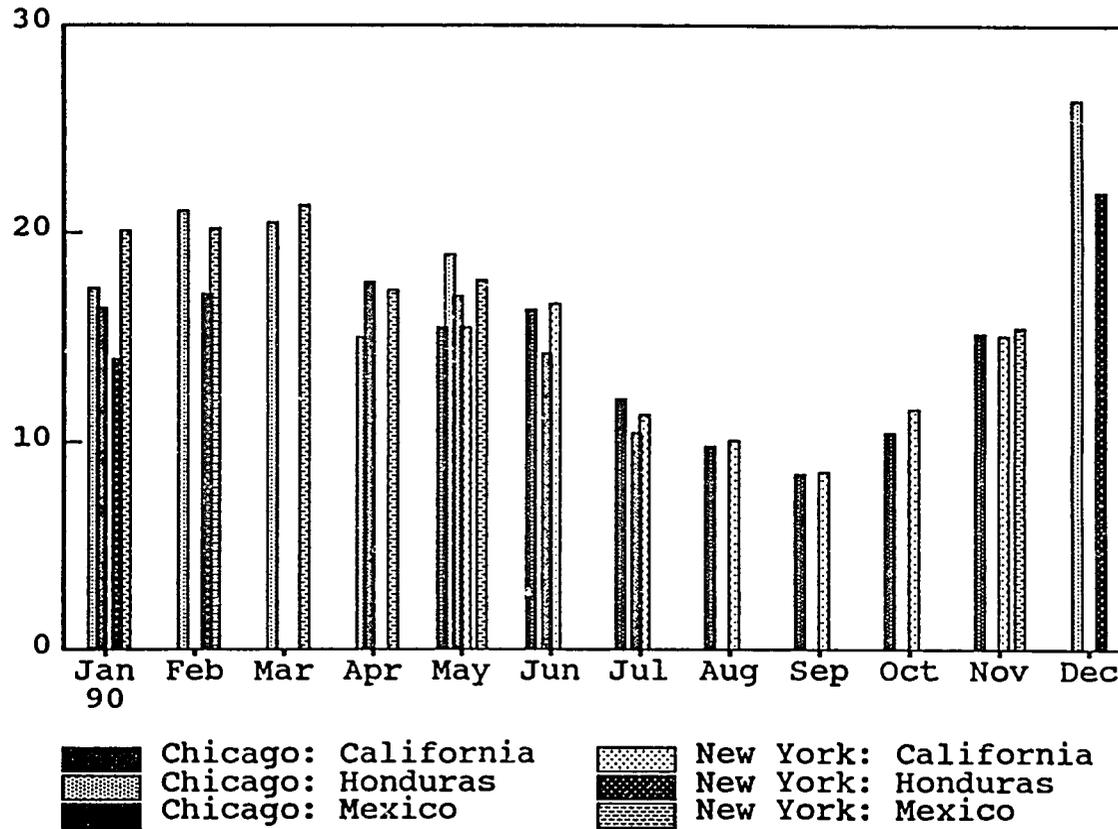
\$ per 2/3 cartons 5s-9s



Cantaloupes

Prices in New York & Chicago

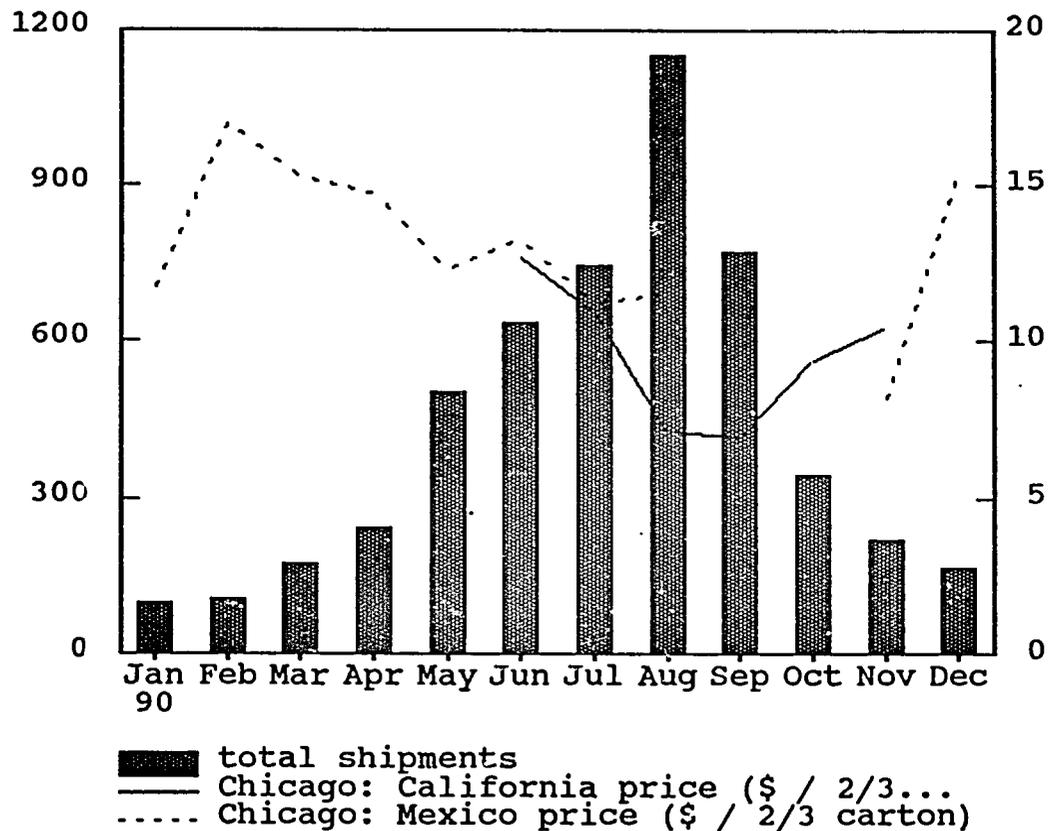
\$ per ■ crate or carton 18s



Graph III-17

Honeydews
Relationship of Shipments to Price

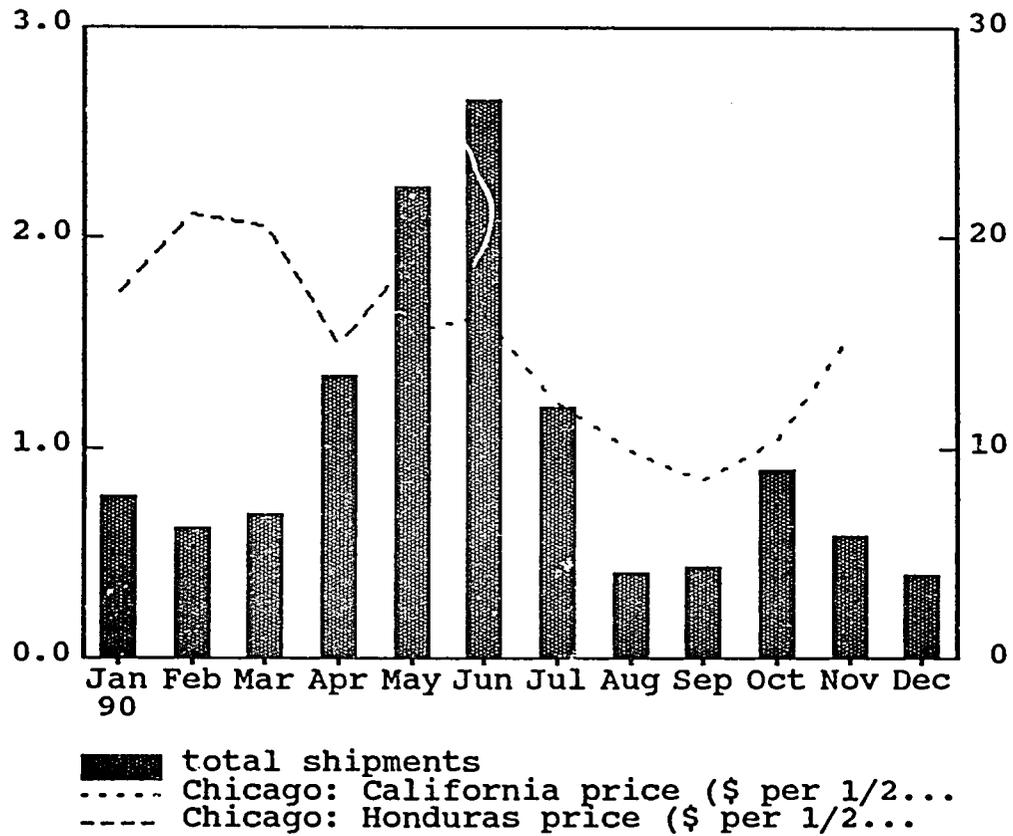
k cwt



Graph III-18

Cantaloupes
Relationship of Shipments to Price

Thousands



The "buyer's broker" typically buys, on behalf of the supermarket, a variety of produce items, shipping the mix in the same transport.

The "receiver" has a closer relationship with producers and exporters, typically specializing in certain products, for example, melons from Central America.

The market price is frequently made where the "receiver" (the *supply*) meets the "buyer's broker (the *demand*).

The reefer conference, a cartel of owners of refrigerated ships (*reefers*), dominates the movement of refrigerated and chilled produce across the Caribbean Sea. The cartel services only specific ports; hence exporters have to move their products overland to a cartel port, irrespective of whether there is a closer port. For example, Nicaraguan exporters at present are forced to ship either at Puerto Cortes in Honduras, or at Puerto Limon in Costa Rica. As a result, Nicaraguan melons cost \$.60 to \$.80 per box more than their Honduran or Costa Rican equivalents. In theory, a shipper may seek alternatives, but, in practice, such a maneuver is only viable if a small number of shippers have significant volume, preferably throughout the entire year.

Exporters may be the local representatives of the "receiver" or a large producer or packer.

Generally speaking, the more intermediaries in the chain, the weaker the flow of market information to the growers, and the greater opportunity for error.

2. Production in Nicaragua

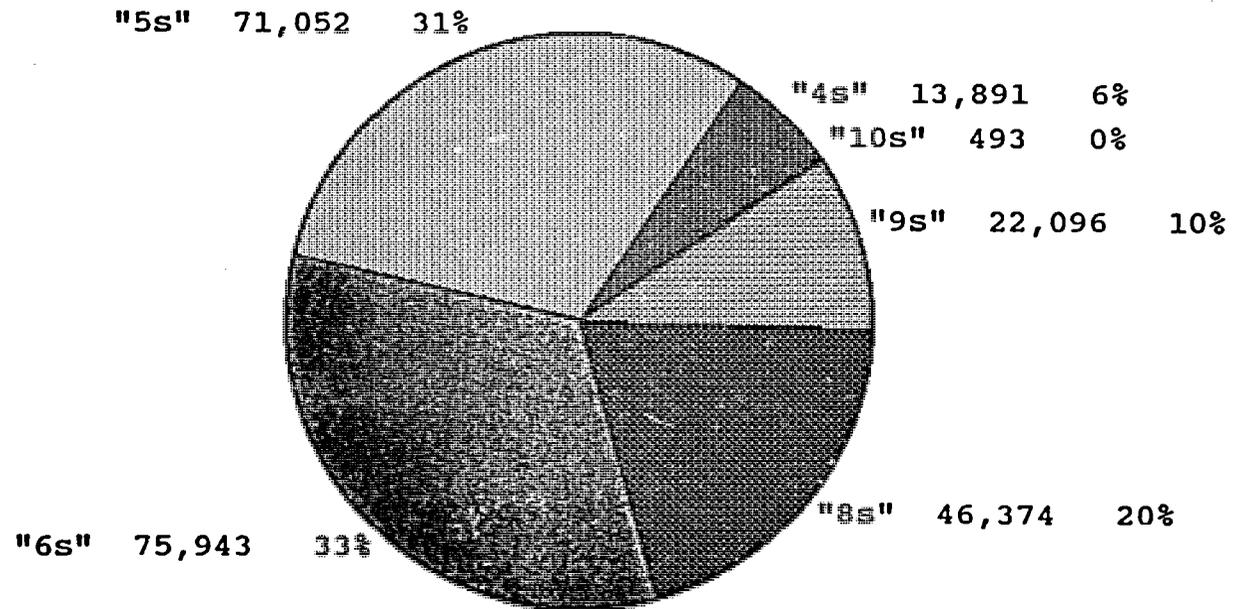
A prime motivation for growing melons in Nicaragua has been to take advantage of the installed irrigation systems intended for rice, a crop no longer always profitable. The specific decision to grow honeydews was prompted by the relative simplicity of the growing techniques and the melon's greater resilience and ability to do without a cold store (honeydews can be shipped without cold stores; cantaloups cannot).

Eleven producers planted honeydews in 1990, when the U.S. approved Nicaraguan exports. Approximately 600 manzanas were planted and 230,000 boxes were harvested. The production units were spread over four micro-zones: Rivas, Malacatoya, Sebaco, and *Occidente* (the western coastal plain). Critical success factors were judged to be **irrigation method** and **soil type**. Approximately 1,500 manzanas are to be planted in the 1991/92 season: 1,000 in honeydew and 500 in cantaloups. Production by size of melon is indicated in Graph III-19.

Technical assistance was provided by PROEXAG, the agency financed by ROCAP to promote non-traditional exports from Central America. Financing was provided

Graph III-19

Nicaraguan Honeydew Production
(by size)



1990

by FNI (total of \$1.3 million). Reportedly only two of the eleven producers broke even or were marginally profitable. Only \$300,000 of the loans were repaid while the rest are being rescheduled.

Observations

There are clearly many obstacles to overcome before Nicaragua can be a viable exporter of melons:

- The route from farm to market is an expensive one. There is talk of a reefer service from Corinto to the West Coast, but no mention of the conference's extending service to a Nicaraguan port. In addition, road transport to Bluefields and the Atlantic Coast is incomplete.
- Both custom officials and phyto-sanitary inspectors have called strikes during shipments of perishables--and continued disruption is likely over the coming years. Overseas "receivers" are therefore unlikely to invest in a time-sensitive crop such as melons.
- The overhead irrigation systems are said not to be appropriate for melons.
- Technical assistance has hitherto been provided free, but will have to be paid for in the future as the PROEXAG program winds down.
- Questions remain whether operations will be profitable.

The overall issue is whether the costs (direct and indirect) of supporting melon growers are justified by the resulting net foreign exchange and income generation.

3. Implications for Non-Traditional Agribusiness Export Products

The production of honeydew melons was suggested to Nicaraguan growers as a prototype *non-traditional agribusiness* product. It was judged the easiest crop for novices and the one that required minimal supporting infrastructure.

The key success factors for *non-traditional agricultural export* crops are **quality** and **timing**. The merchandising of produce, the paradigm case of *non-traditionals*, requires the goods offered for sale by retailers to correspond closely in appearance with commonly sold varieties, to be free of diseases, pesticide residues, and so-called *cosmetic* blemishes. (In all these respects, the produce must meet USDA and FDA requirements.) They must also tread the fine line between unripe and overripe. Nevertheless, even "perfect" vegetables or fruit cannot automatically command a premium price. That will depend on the volatile supply and demand characteristics

of thinly traded markets. There are few items for which the time-honored marketing formula -- *the right product, at the right place, at the right time* -- better applies.

If marketers are to achieve these standards, they need to bring to bear both agronomic and communication technology. Market information and the ability to analyze it pragmatically is critical in the decision **what to plant and when to plant it**. Growers, their technicians and field operatives must be trained to see through the growing phase. Appropriate irrigation services must be available at critical times. The necessary seeds, fertilizers and agricultural chemicals must be available in a timely manner. Harvesters and requisite chilling hardware must be available when the crop is ready. Transportation and storage facilities must be ready when the goods are sent to market. Commercial arrangements must be in place for the goods to be sold into the North American or European product system. For optimal results, exporters should be in constant touch with ship-owners and *receivers* in an effort to merchandise at peak prices. In short, **the system complexity far exceeds that of traditional agribusiness exports**. This complexity requires the structure of key relationships--between *receiver* and exporter, and between exporter and grower--to be at a sophisticated level.

Experience in other Central American countries has shown that the participants who are best able to operate in this environment are the better educated members of mercantile families with agribusiness interests. The physical and psychic distance between a cooperative of indigenous farmers from a mountainous region of the isthmus and the produce merchants of south Florida has proved difficult to bridge. **In the short term, therefore, *non-traditional agribusiness exports* do not represent a viable option for small and cooperative farmers in Nicaragua.**

In light of the foregoing, the Nicaraguan government should remain neutral regarding efforts by individuals to export *non-traditional agribusiness* exports to the U.S.A. and elsewhere. Interested parties should naturally have complete liberty to invest their own resources in infrastructure and marketing efforts as they see fit. Government's only responsibility should be to maintain a professional corps of phyto-sanitary inspectors and customs officials.

Non-Traditional Alternatives

As remarked elsewhere in this report, the diet of low-income, urban Nicaraguans appears deficient. Retail distribution also appears crude and scarcely able to handle perishable commodities. This could be the starting point for cash crops that small and cooperative farmers could grow. Having gained experience in the domestic market, Nicaragua might, in the medium-term, consider exports to its neighbors and ultimately to developed countries.

Government has three roles to play: planning and executing a program to improve the physical well-being and hence the nutrition of its citizens; constructing the appropriate infrastructure for its achievements, (everything from clinics to roads to cold stores), and providing extension services to farm families in respect of those crops that might be produced competitively in Nicaragua. The latter are likely to include **edible beans and vegetables**.

The first step should be the provision of extension services to small farm families, assisting them to expand and improve their production of beans. Simultaneously improvements should be made in communications between the interior and the populous Pacific plain: roads and telecommunications.¹⁰

The second step would be to **follow-up** on the bean extension service by adding two types of vegetable: **green vegetables that enhance meal esthetics** (tomatoes, bell peppers and the like).¹¹ Meanwhile some improvements to the infrastructure for preserving perishables (meat, milk, fruit as well as vegetables) should have taken place, permitting country merchants to facilitate the transfer of fresh vegetables from the interior to urban markets.

¹⁰ The primary benefit of the latter steps would be the facilitation of coffee exports.

¹¹ These crops are suggested by way of example only and have not been explicitly studied in the preparation of this report.

E. CORN SYSTEM

1. Domestic Market

Current market size is about 239,000 tons (3 million cwt). Total market volume grew at 3.2 percent a year between 1980 and 1990, while, over the same period, population growth of 3.3 percent. Total use under current policies is projected to grow to 384,000 tons by the year 2000.¹²

As indicated in Graph III-20, the market may be divided into two, main segments: the on-farm and the urban markets. The **on-farm market** is estimated to be about 115,000 tons (2.5 million cwt). Although, few reliable nutrition surveys appear to have been carried out in recent years, available information and comparisons with neighboring countries suggest that on-farm and rural consumption is some 210 grams per day for about 1,500,000 people.

The rural population seems to be growing at about 2.3 percent a year. Assuming that rural incomes improve only slowly, *per capita* consumption is likely to remain the same. Therefore, on-farm consumption by the year 2000 may be projected at 145,000 tons (3.2 million cwt).

Nicaragua is predominantly an urban country. Over 61 percent of its estimated 3.85 millions lives in a town or city. One million of the 2.35 million urban population lives in Managua. Urban consumers have available to them a limited variety of energy and protein foods: bread, fats and oils as well as corn; broilers as well as beans. Thus *per capita* consumption of the elements of the traditional diet--corn and beans--are thought to be lower than in the countryside. Furthermore urban *per capita* consumption fell during the 1980's from about 130 to 110 grams per day.

The urban population is said to be growing at just below 4 percent a year. Most observers agree that even the most optimistic economic forecasts do not see significant *per capita* income growth before the turn of the century. Given the likelihood that incomes will stay the same or drop slightly combined with the availability of alternative energy foods, particularly wheat flour, urban *per capita* consumption of corn is projected to drop to 103 grams per day.

The variety of corn grown in Nicaragua and its neighbors is *white corn*. The normal article of commerce on the international market is, of course, *yellow corn*. Outside certain countries bordering the Caribbean Sea, a few countries in Africa and the U.S.A. produce *white corn*. Occasional surplus *white corn* is available from African sources on an erratic basis, usually at a premium to yellow corn of between \$10 to \$30 per ton. The growth in demand for *Mexican food*, especially corn chips, has

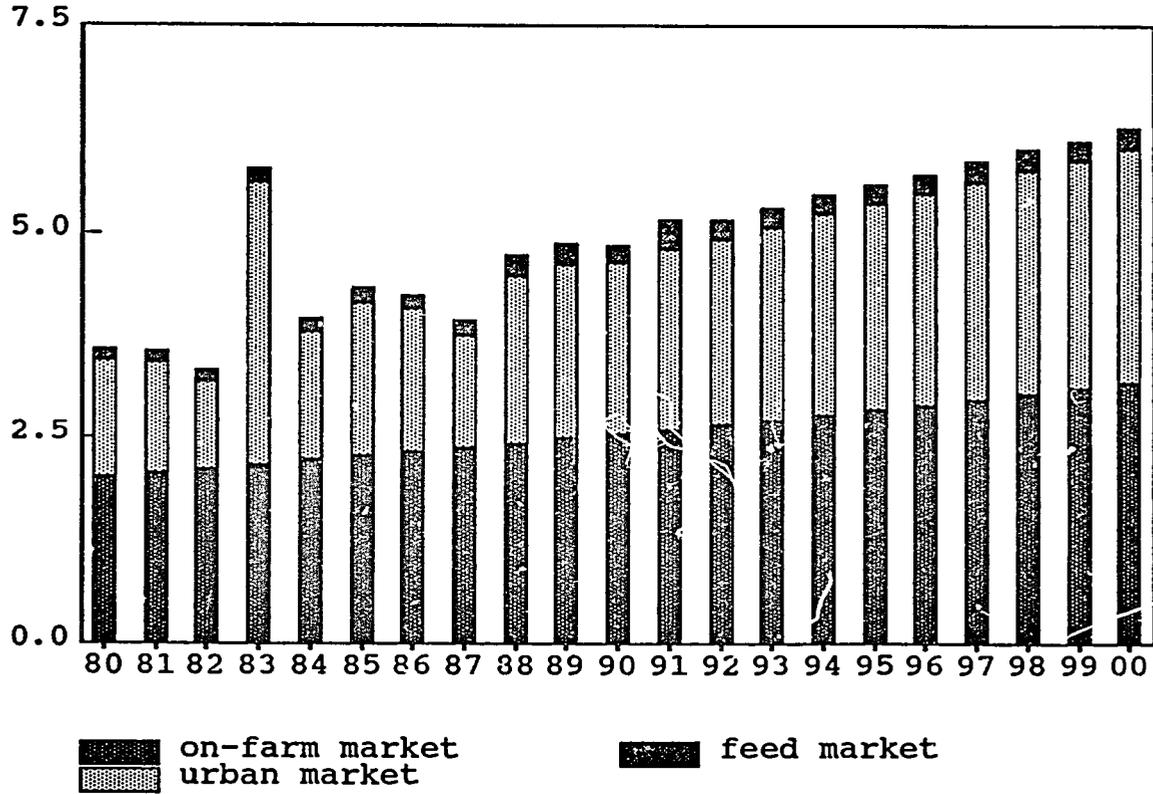
¹² Under the foreign exchange constrained scenario, the market would grow to only 219,000 tons.

Graph III-20

Corn
Total Market Size

k cwt

Thousands



stimulated the production of *white corn*, originally in the south-west but more recently in the Corn Belt. U.S. *white corn* trades at a substantial premium to *yellow corn* in the Corn Belt area and is seldom exported.

When *white corn* has been in short supply in Nicaragua, for example in 1986, *yellow corn* has been brought in from abroad. In principle, Nicaraguan consumers strongly prefer *white* over *yellow corn*. Nonetheless, in times of extreme need, *yellow corn* will be eaten. Quantities of *yellow corn* were donated at Nicaragua in 1989 and duly stored at the Los Brasiles elevator that ENABAS, the state-owned grain trading company maintains for handling imports. While some *yellow corn* appears to have been consumed directly, as soon as *white corn* was once again available, sales were shifted to poultry producers for use as feed.

White corn in good condition is not normally sold for feed. As with most bulk grain handling facilities, the ENABAS elevators degrade a certain quantity of corn, and this is normally sold as a feed ingredient. The current volume is about 10,000 tons (220,000 cwt), and this is projected to grow to between 12,000 to 15,000 tons by 2000.

2. System Components

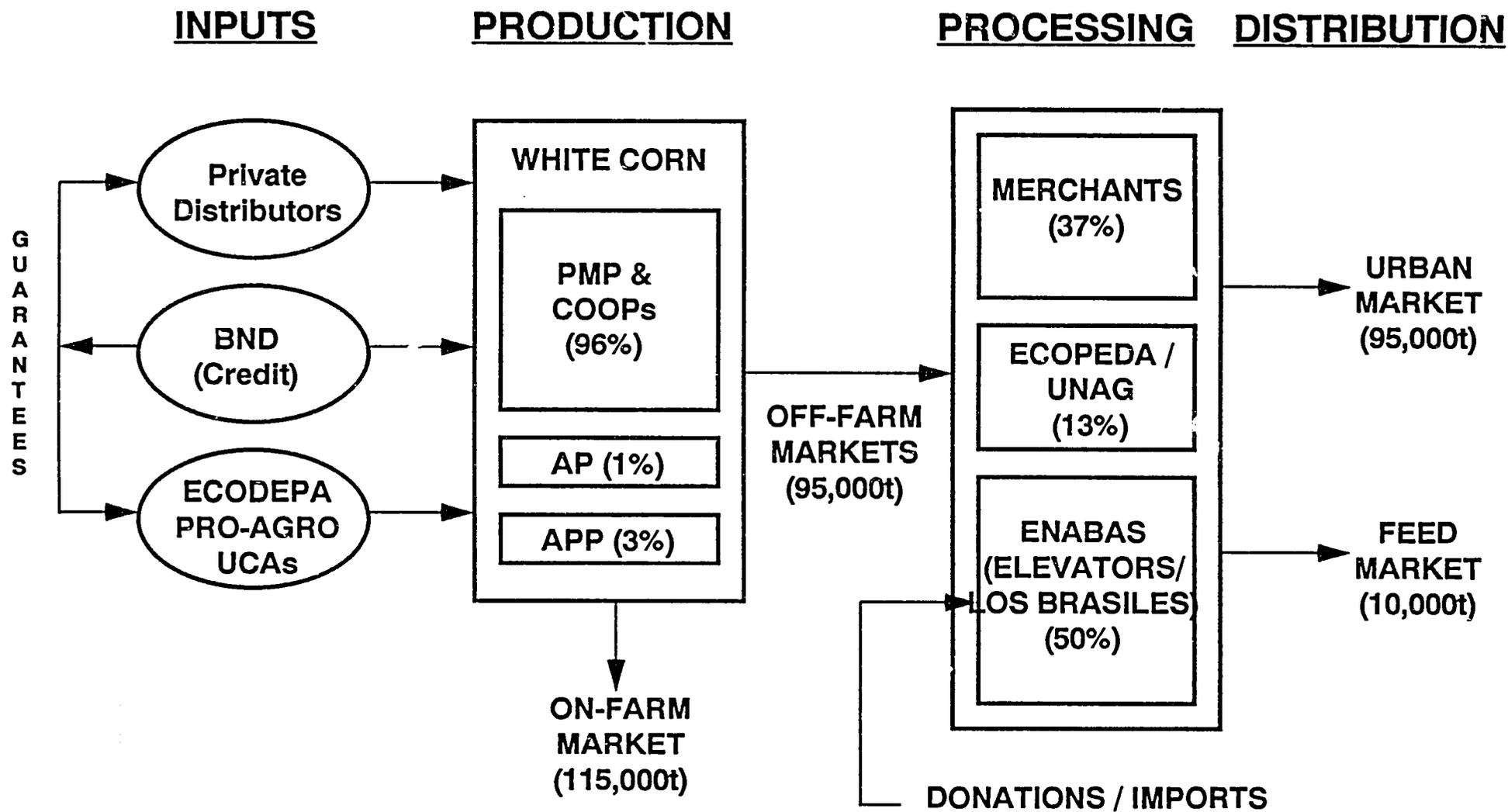
Graph III-21 titled *Corn System* represents the various components of the system, and the principal participants in each component. End-users, acquire corn or corn products from retailers who, in turn, obtain it from the wholesalers, private, cooperative and state-owned. The wholesalers (or "merchants") connect consumers and producers. Merchants may buy from truck-dealers. Various rural agents, often truck-dealers or country merchants, provide credit, inputs, bags and even shelling services to producers.

End-Users

The end-users of *white corn* are households, urban and rural. Farm families set aside at harvest time sufficient corn to feed the family for the next year. The shelled corn is usually stored in bags. Every day, the amount to be consumed the next day is set to soak overnight in a lime solution. The following day, the corn is washed, then converted directly into a dough that is patted into the typical round, flat *tortilla* shape. The *tortillas* are then cooked on a metal plate over a wood fire. In the cities, *tortillas* are prepared in kitchens by *tortilleras* and even on busy sidewalks. *Tortillas* probably account for three-quarters of the corn consumed.

There are two other commonly eaten foods containing corn. *Nacatamales* are oblong patties consisting of corn mixed with herbs and flavorings that are baked in corn or banana leaves over a wood fire. *Pinolillo* is a home-made beverage made by mixing corn and sugar with water--a poor person's cola.

Corn System



Retailers

The typical retail outlet in Nicaragua is a general store selling a wide variety of dry goods including food items. The grains are usually sold loose from open hundredweight bags positioned around the floor. The so-called *tiendas campesinas*, established by the cooperative movement, conform to this pattern too. Currently the retail markup is about 15 percent.

Wholesalers

ENABAS operates a number of wholesale outlets in addition to its bulk grain elevators. Corn is bagged at the elevators, then trucked to its wholesale outlets where it is offered for sale at about C\$105 per hundredweight.

Private merchants operate differently. City merchants buy from their country counterparts dry corn in bags. The country merchants, often truckers whose principal interest is providing cargo for their transportation business, commonly have no drying capability and only basic storage space. Therefore, they tend to be limited to buying corn that has been dried in the open by farm families, or corn available late in the crop when the ears have dried in the field. Alternatively they accept imperfectly dried corn and merchandise it immediately.¹³

ENABAS appears to merchandize its corn so as to offset the practices of private merchants. During the 1990-1991 crop year, ENABAS's share of the urban market was under 10 percent, rising to between 20 and 40 percent between March and September, but some 70 percent during October and November. Through timing of sales and setting a public wholesale price, ENABAS effectively controls the consumer price.

In a normal "carrying charge" market, the expected price of the agribusiness commodity during the off-season, especially the period shortly before the new harvest begins, is a reference point. Commodity traders, as they face the harvest campaign, deduct from the reference price: first, the cost of transporting the commodity from the point of purchase (the farm) to the receiving point (the elevator); second, a periodic "charge" equivalent to the cost of financing inventories plus storage costs; and third, a profit margin. The resultant value is the price the trader would bid to producers during the harvest.

The traders' praxis typically results in a **wholesale market** price that starts low during the harvest, then rises gradually throughout the year, peaking at the end of off-season. The **producer** price generally follows the same pattern, but, the difference between the wholesale market price and the producer price, (the geographical *basis*), increases suddenly at harvest time, then declines as it ends.

¹³ Consequently corn is not the major interest of private merchants.

In Nicaragua, there is no evidence of market price behavior. It has already been mentioned that ENABAS manipulates the price. It typically does so by fixing its wholesale market price and producer bid price independently one of the other. At times, ENABAS sells below replacement cost. For example, over the last year, ENABAS generally priced its corn slightly below the market wholesale price, except during the last quarter of 1990, coinciding with the major harvest movement. It also holds prices constant for long periods, ignoring interest and storage costs. The whole topsy-turvy pricing situation is exacerbated by inflation. The calculation of dollar values for commodities itself becomes problematic as the *cordoba* inflates.

Grain Elevators

There are three categories of grain facility, all of them managed by ENABAS. Total upright storage capacity is 3,455,800 cwt, while total godown, bag storage capacity is 1,151,700 cwt. This capacity is made up partly of five regional elevators (*terminales*), with two more currently idle. The active elevators are located in Managua, Chinandega, San Isidro, Carazo and near Granada with total upright bulk storage capacity of 1,276,800 cwt, and total godown, bag storage capacity of 333,700 cwt. There are fifty-nine satellite elevators (*Depositos de Almacenamiento Popular*), forty-nine of which consist of six 4,000 cwt upright bins. Their total upright, bulk storage capacity is 1,179,000 cwt, and their total godown, bag storage capacity is 618,000 cwt. Finally there is the Los Brasiles elevator, used for holding offshore grains, with upright, bulk storage capacity of 1,000,000 cwt and godown, bag storage capacity of 200,000 cwt.

There are four corn crops that come forward in the following percentage pattern (based on 1990):

	<u>PRIMERA</u>	<u>POSTERA</u>	<u>APANTE</u>	<u>VERANO</u>
January		2		
February		1		
March			3	
April			6	
May			2	
June				2
July				2
August	12			
September	38			
October	26			
November		3		
December		3		
Total	76	9	11	4

Typically farm families retain corn from the *primera* crop for their own use--consumption and seed--selling only the surplus. While it is hard to quantify, sales off-the-farm lag production, though the need to repay trader or bank credit can bring forward the sales date. In fact, corn may be committed to merchants while it is still growing.

The concentration of production over a few months and the need to hold corn (and other grains) for regular supply to the market throughout the year results in distinct peaks in grain inventories. It is worth noting that **ENABAS upright storage capacity was adequate, over the last three years, to store Nicaragua's combined inventories of corn and sorghum** (the two grains handled in bulk), and, for most of the year, the upright storage capacity of the regional elevators was sufficient.

Transport and Handling of Grains

ENABAS receives corn in bags or in bulk at its DAPS or regional elevators where it is dried and conditioned, then stored in bulk. It moves corn primarily from its regional elevators to the Managua elevator, also in bulk. In Managua, corn is bagged, then sent to wholesale outlets in bags. This system should, in theory, be more efficient than that followed by private merchants of moving all corn in bags from the farm to the market.

ENABAS, over the last crop cycle, purchased between a quarter and a third of corn sold off-the-farm except during October 1990 when it bought 100 percent of offerings. Merchants typically obtain corn from truck-dealers, (*transportistas*), who, in turn, collect it from small farms to whom they supply bags, and often shelling equipment.

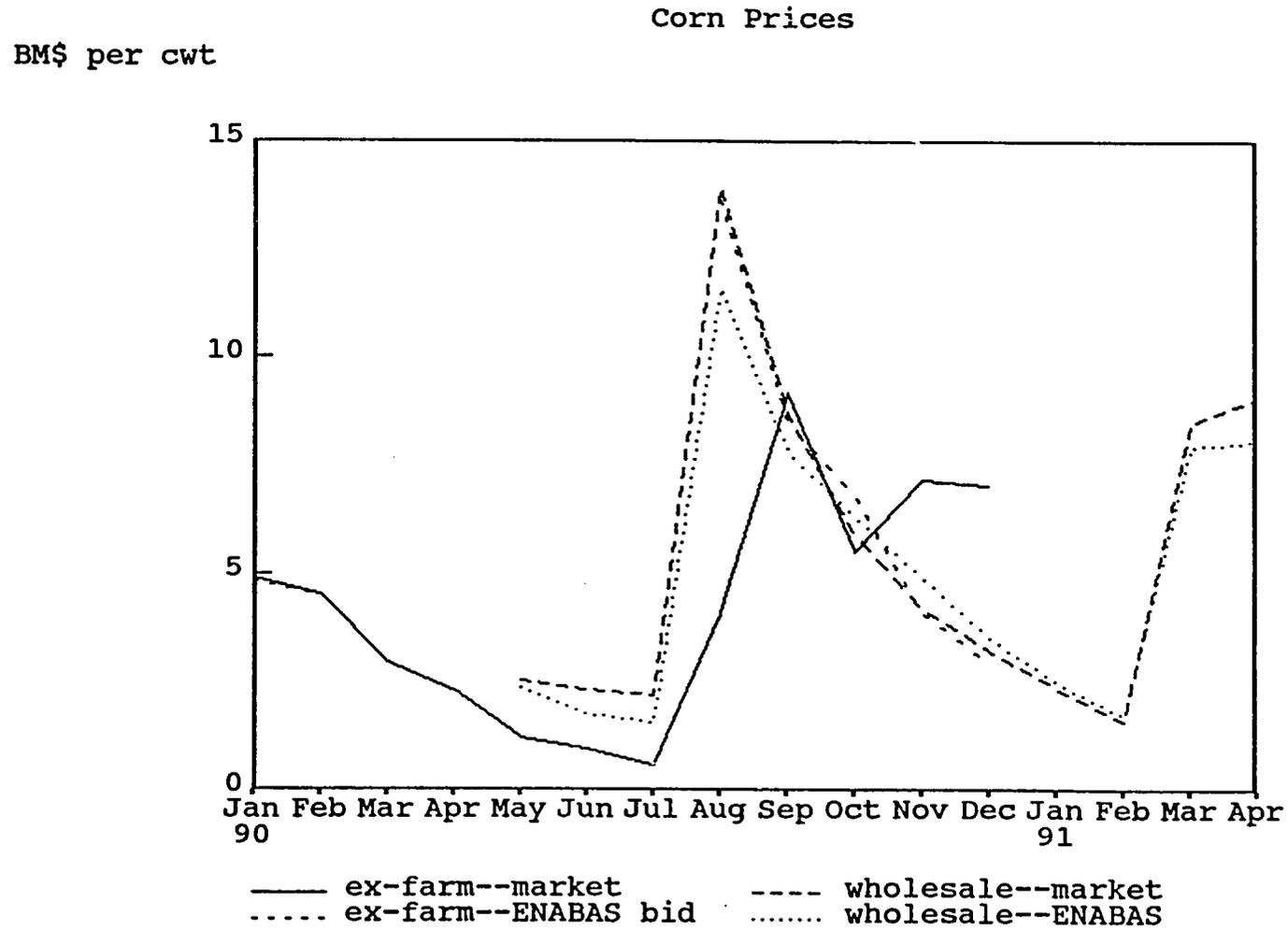
Farm Prices

Available data suggest that ENABAS increased its bid to producers substantially in August 1990, but failed to adjust it in line with inflation. (Graph III-22) This oversight allowed the free market ex-farm price to rise above wholesale price levels after November! In general, ENABAS continues to pay above market prices during the harvest, and sell below the wholesale market price, thus fulfilling its (contradictory) role of supporting the income of small farmers while holding down the price of basic foodstuff those urban consumers who maintain a traditional diet. ENABAS's policy of buying most vigorously during the period when the heaviest off-farm movement occurs, holding corn in inventory, then selling in the quarter prior to the new crop naturally complements this strategy. The presumed "loss" that results from this "anti-market" strategy is not published and is presumably offset by other more "profitable" ENABAS activities.

Proposed ENABAS Strategy Change

ENABAS proposes shifting its emphasis in the 1991-1992 crop year from supporting sorghum growers to assisting corn producers. ENABAS is also considering shifting from trading in grain to offering grain-related services, particularly in sorghum. The sorghum growers or the feed compounders would rent space at ENABAS facilities. Meanwhile ENABAS would divest its DAPS, focusing its operation on the regional elevators. There is allegedly some interest from *Uniones de Cooperativas Agropecuarias* in acquiring the *DAPs* (see section below titled *Cooperatives*).

The proposed strategic change clashes with ENABAS's capabilities in three respects. First, there is no direct link between most corn producers and ENABAS. The producers require the deceptively important services of shelling, bags and transport from the farm to the elevator. Naturally, this situation is made more acute if ENABAS divests the *DAPs*. Second, ENABAS has traditionally had little contact with the figure of the *transportista* who performs these missing functions. Finally, ENABAS is ideally suited as a conduit for credit to small farmers for whom the marginal investment in superior seeds and fertilizers could produce significant returns.



Cooperatives

The *Uniones de Cooperativas Agropecuarias*, (*UCAs*), perform services for its member production cooperative comprising (in the following presumed sequence): joint procurement of inputs, joint marketing of surplus production, and joint ownership and operation of handling, storage and processing facilities. It has been observed that *UCAs* have, since the change of government, begun expanding their economic activities as the federal government has discontinued favoritism towards cooperatives. The third level of *UCA* business activity would, of course, encompass the operation of *DAPs*. The complexity of managing grain facilities probably exceeds the current capacity of the *UCAs*--*even to run DAPs conceived as an extension of farm storage*.

Farm Types

Nicaraguan farms are typically divided into the *private sector* and the *reformed sector*. They are further divided into large commercial farms (*AP*), small and medium-sized farms (*PMP*) (that usually includes cooperative farms), and state collective farms (*APP*).

Ninety-six percent of corn is produced by small and medium farms, up from 90 percent in 1980. Yields increased, between 1980 and 1990, from 15 to 20 cwt per *manzana*. Three percent of corn is produced by *APP* farms, down from 7 percent in 1980. *APP* yields in the same period varied between 30 and 55 cwt per *manzana*. Finally one percent of corn is produced by *AP* type farms, down from 3 percent in 1980. *AP* yields varied in that period between 20 and 40 cwt per *manzana*.

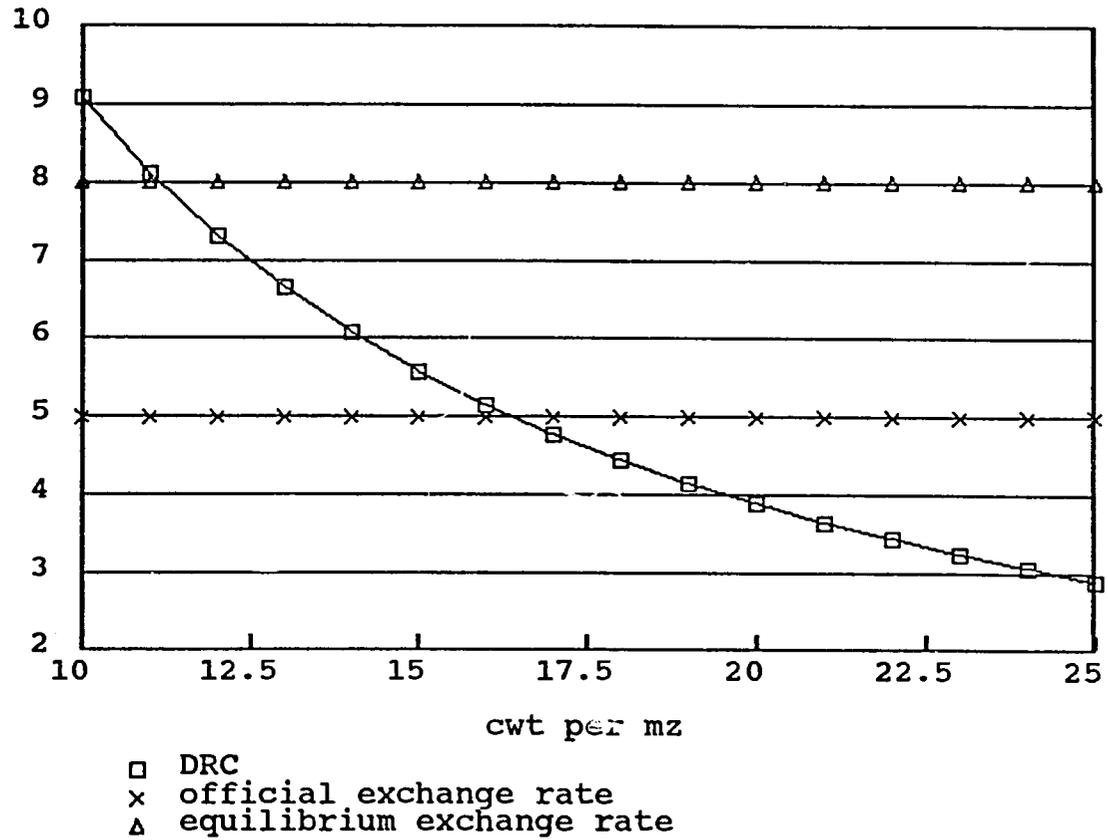
3. Production Costs

Fully allocated, engineered production costs, such as those used by banks to estimate the amount and disbursement schedule for crop loans, indicate that the prevailing ex-farm price of C\$38.60 per cwt barely covers expenses. From a national perspective, the *Domestic Resource Cost* calculations, (where the *point of competitiveness* equals the exchange rate), illustrate corn's scant competitiveness with imported similars. (Graphs III-23-25)

Graph III-23

Domestic Resource Cost as a Function of Yield
Corn (Using Hand Labor)

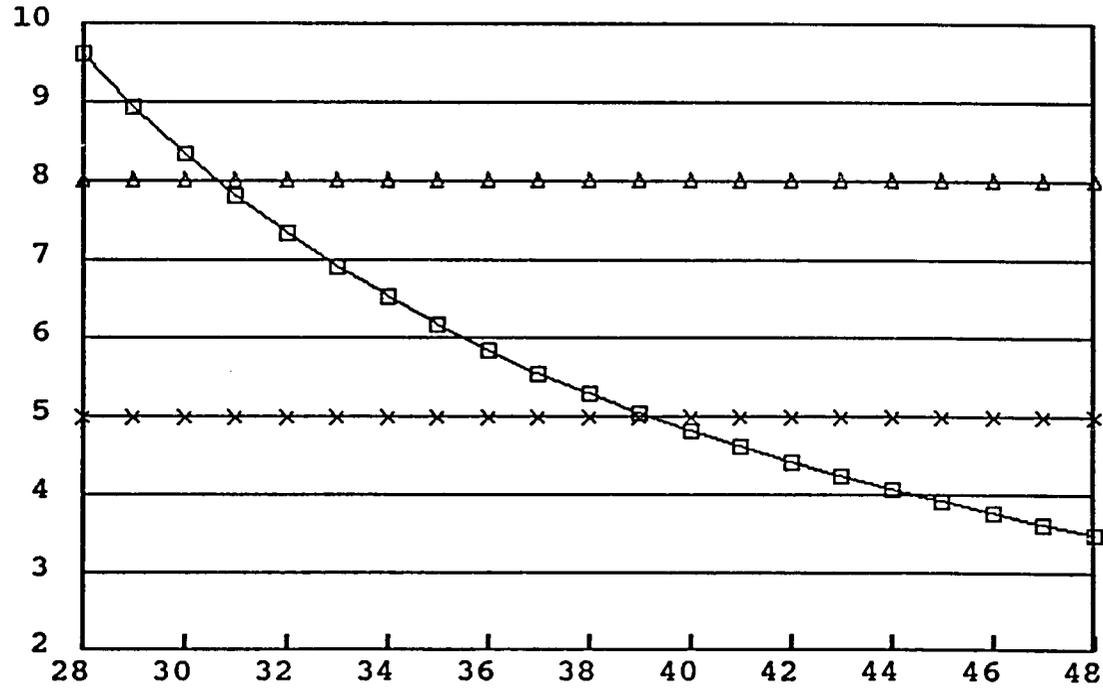
Cordobas per \$



Graph III-24

Domestic Resource Cost as a Function of Yield
Corn (Using Oxen)

Cordobas per \$

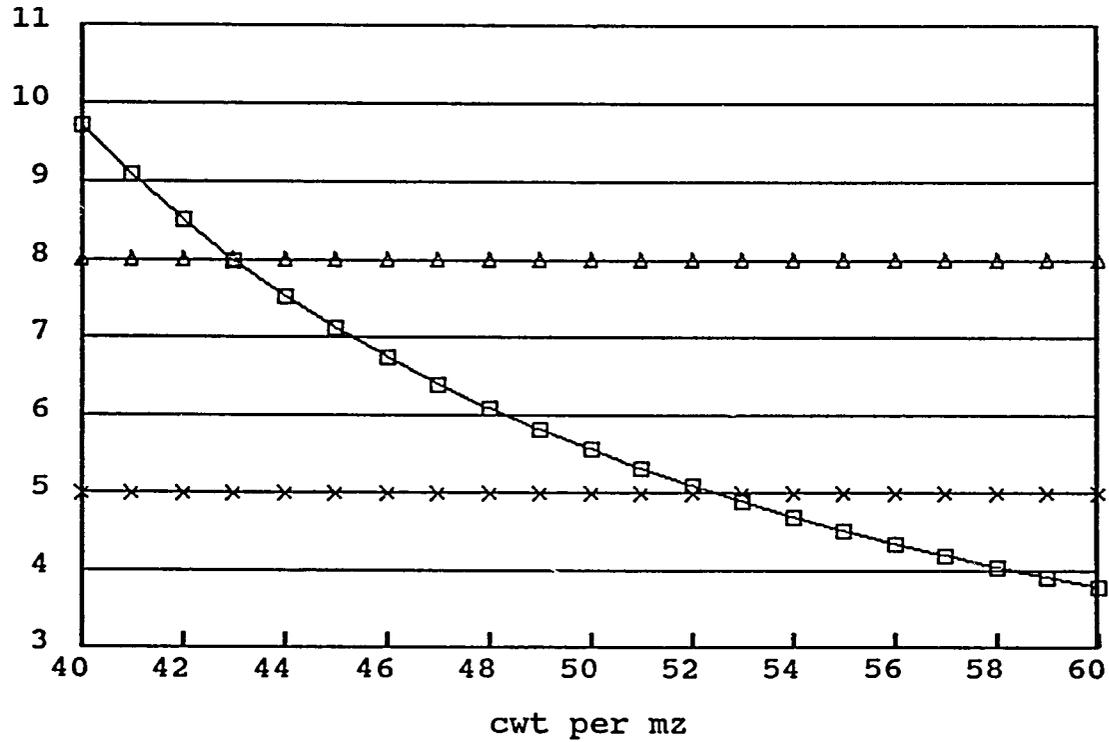


- DRC
- x official exchange rate
- △ equilibrium exchange rate

Graph III-25

Domestic Resource Cost as a Function of Yield Corn (Using Tractors)

Cordobas per \$



- DRC
- × official exchange rate
- △ equilibrium exchange rate

<u>farming method</u>	<u>costs per mz</u>	<u>revenue per mz</u>	<u>DRC</u>
hand labor	C \$35.99	US \$9.25	4.45
using oxen	C \$38.64	US \$0.64	4.83
using tractors	C \$41.16	-US \$26.00	5.38

In order for corn to be attractive to Nicaragua, yields would have to be much higher than today. The following table indicates the recent range of yields by farm type while Graph III-26 provides international comparisons.

<u>farming method</u>	<u>required yields</u>	<u>current yields</u>
hand labor	20 - 25}	PMP ¹⁴ -- 15 - 20
using oxen	40 - 45}	
using tractors	55 to 60	{AP -- 20 - 40 { {APP -- 30 -55

Current prices are more or less in line with international levels. Therefore, only greater production could lead to higher profitability in a free market environment. Further mechanization is totally inappropriate to both the farm families that produce corn and on most of the fields where it is grown.

Better varieties are probably the most promising route to greater productivity. Unfortunately this would require farm families to purchase hybrid seeds and apply nitrogen fertilizer in order to obtain an increase in yield that would justify the investment. In turn this would require crop loans, which tend to be problematic for small farms.

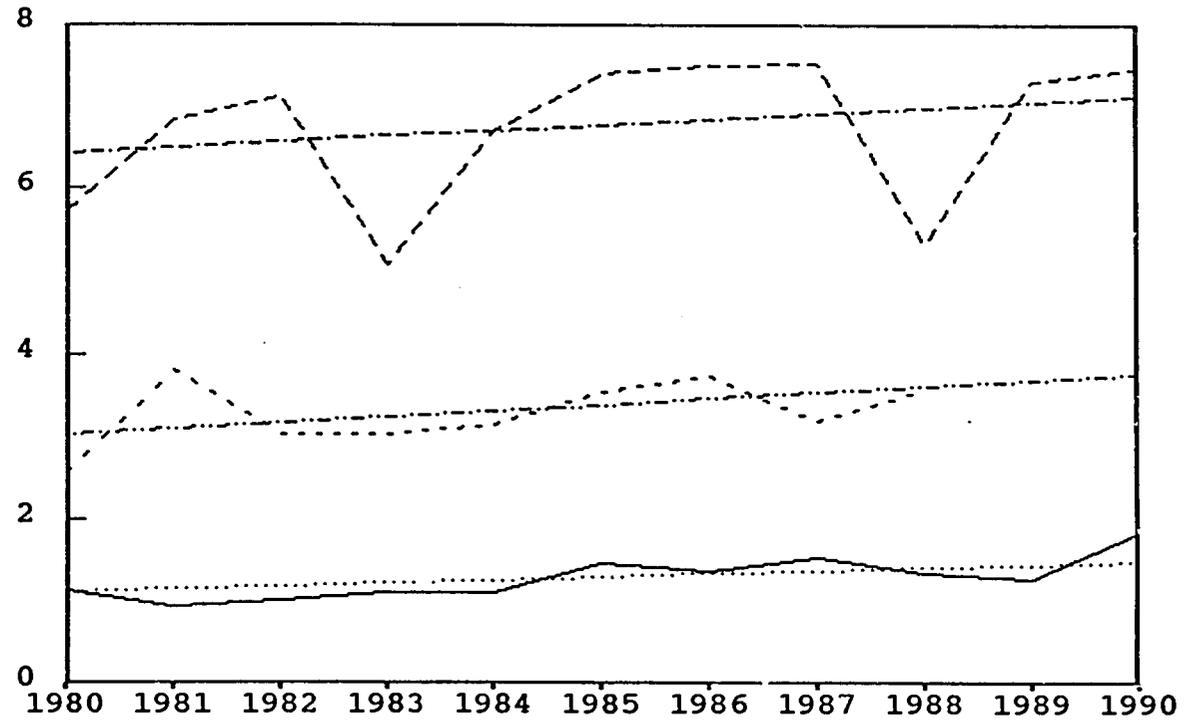
Accordingly, it is judged likely that improvements in corn productivity will occur only after farm families receive higher cash incomes that permit them to set aside their own funds for farm improvements. Edible beans is the crop that offers the best chance of increasing farm incomes. Higher corn yields consequent on the adoption of superior varieties seems likely after 1995.

¹⁴ Average of hand labor and use of oxen.

Graph III-26

Corn Yields

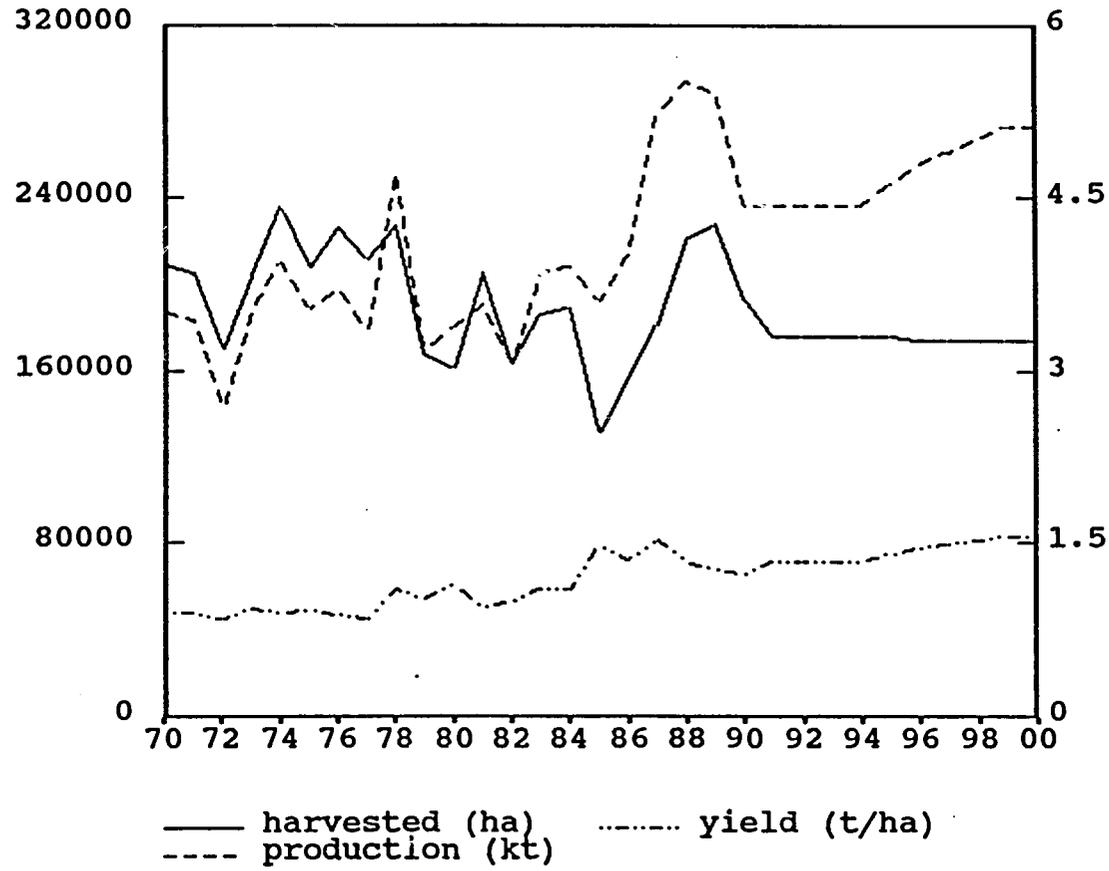
t per ha



— Nicaragua
..... Argentina
----- USA

..... Nica trend
----- Argentina trend
----- USA trend

Corn--Major Trends
(Actual to 1990, Projections to 2000)



Meanwhile corn area will stabilize at this year's level while the on-farm population increases. Consequently, off-farm sales are projected to drop from 75,000 tons in 1990 to 55,000 tons by 2000. Even with the slight decline in urban *per capita* consumption rates, mentioned above, offshore supplies will rise from to about 90,000 tons by 2000. (Graph III-27)

4. Summary

The urban market is currently growing at 4 percent, in line with the rate of urban population growth, and consequent on lower personal income and a reverse substitution of wheat flour, rice and sugar by the "inferior" white maize. Domestic production meets on-farm needs of about 115,000 tons, but the surplus sold off-the-farm, about 75,000 tons, is insufficient to supply the urban market. Imported and donated yellow corn, currently 40,000 tons, supply the difference, and volume will reach 90,000 tons per year by 2000.

Domestic production costs are high and international prices projected to remain at current levels. Therefore, increasing domestic production represents a high-cost option for supplying the urban market, while offering poor income prospects to farmers. The world market is clearly the lowest cost source of corn (and wheat flour too), and the U.S.A. has a growing production of white corn that is available for export at prices comparable to those of yellow corn. By the same token, there is no question of Nicaragua's striving for export markets.

At the policy level, the question of feeding the urban population that retains the traditional *tortilla*-based diet is best uncoupled from that of small-scale, subsistence agriculture. In all Central American republics, the urban diet evinces a secular shift away from corn to wheat flour; typically the substitution of a bread roll for the breakfast *tortilla*. The government's task should, in the long run, be to enable private commodity traders and food companies to supply the urban market with a variety of dietary items at least cost, irrespective of their source.

Corn is likely to remain as a subsistence crop, especially on small farms. Unfortunately low yields incline the farm family to plant a large proportion of its land to corn and thus forego potential income from other cash crops, especially beans and vegetables. In the medium-term, new varieties of corn (say, from 1995 onwards), could improve yields and thus release more land for small farmers to grow cash crops. But this should occur after farm families have improved their cash income potential and are financially able to afford the new seeds, concurrent agricultural chemicals and have raised their skill level.

The state grain trading company, transformed as soon as possible into a small number of investor-owned corporations, should continue to handle, dry and store in bulk corn sold off-the-farm and destined for the urban market, as well as international donations, and eventually imports.

F. EDIBLE BEAN SYSTEM

1. Domestic Market

Consumption

The current market size is about 53,000 tons, with 48,000 tons (1 million cwt) going for human consumption and is projected to grow to 66,000 tons (1.5 million cwt) by 2000. Volume grew at an annual rate of 2.6 percent from 1980 to 1990, while the population is thought to have grown at an average of 3.3 percent. The structure of the bean system is shown in Graph III-28.

Nicaraguans are very particular about the beans they eat. Consumers strongly prefer the *small, red bean*. Indigenous products are preferred. In recent years, most imported products--from the U.S.A., Chile, Argentina, and China--have been judged inferior. The beans are cooked, seasoned, mashed, and eaten by scooping them on a corn tortilla. Per capita consumption of beans is highest on-farm, where alternative protein foods are costly if purchased or depend on seasonal availability from livestock. As shown in Graph III-29, the on-farm market is currently about 30,000 tons (0.66 million cwt) and is estimated to grow to 38,000 tons (0.83 million cwt) by 2000. The on-farm market is expected to grow at an annual rate of 2.3 percent, in line with the increase in rural population. Per capita on-farm consumption is currently 55 grams per day.

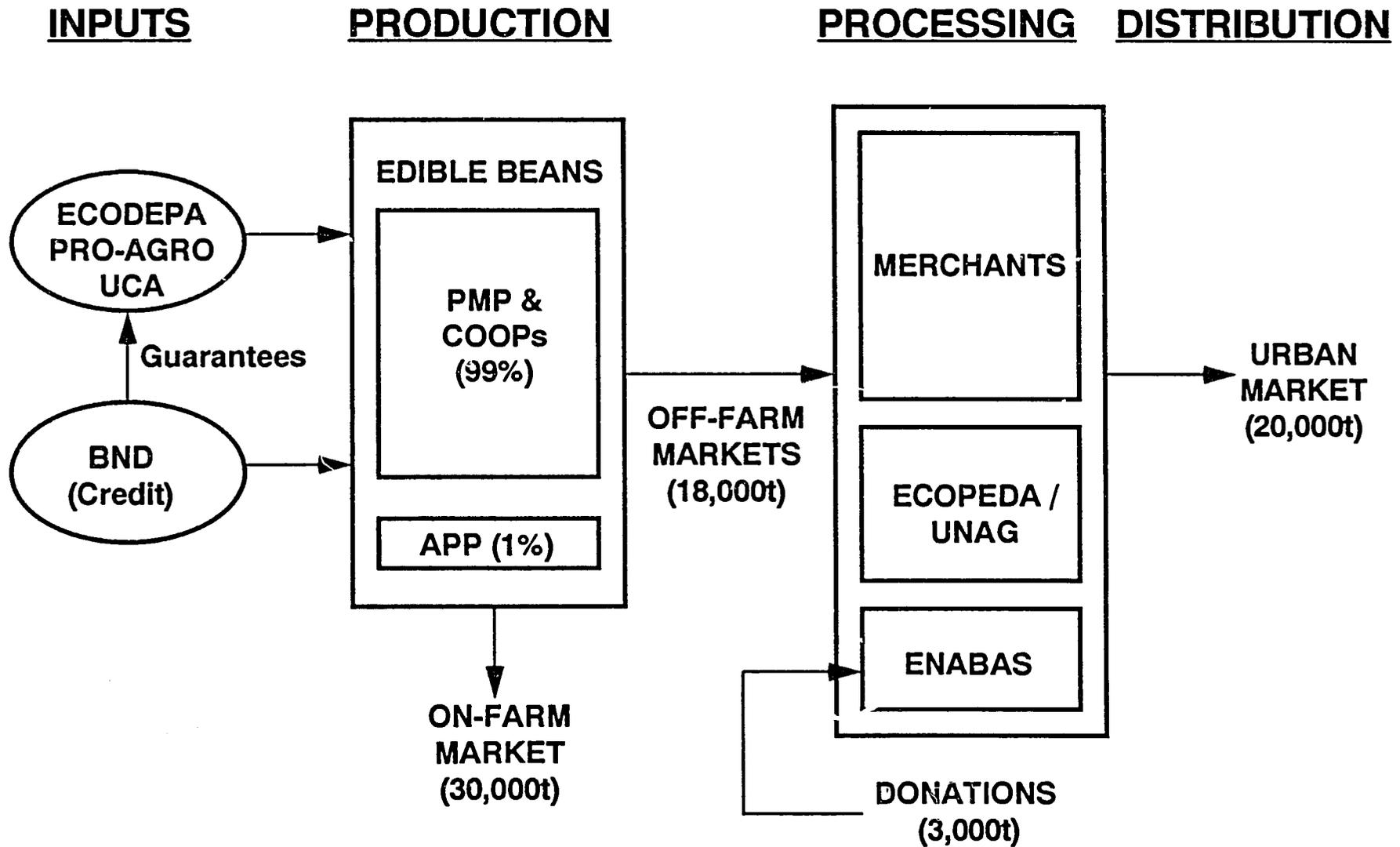
The urban market is currently about 18,000 tons (0.4 million cwt) and is projected to grow at an annual rate of 4.3 percent to 28,000 tons (0.63 million cwt) by 2000. Per capita urban consumption fluctuated during the 1980s, but is expected to remain steady during the 1990s at 23 grams per day. Per capita urban consumption of beef, pork, and broilers declined during the late 1980s and early 1990s. Furthermore, market growth for meat is usually associated with per capita income growth, which seems unlikely to recover for many years. As a result, current levels of per capita consumption of beans are likely to continue.

Distribution

Retailers are primarily small stores selling a variety of goods including foodstuffs. Beans are sold loose by weight, usually dispensed from opened bags in neighborhood stores. In rural areas, local cooperatives operate *tiendas campesinas* that, in addition to farm supplies, carry basic food items for farm families.

Wholesale merchants are usually urban based and provide a service consisting of bags and farm-to-market transportation, either directly or through the intermediary of a truck-dealer (*transportista*).

Bean System: Total Market (50,000t)

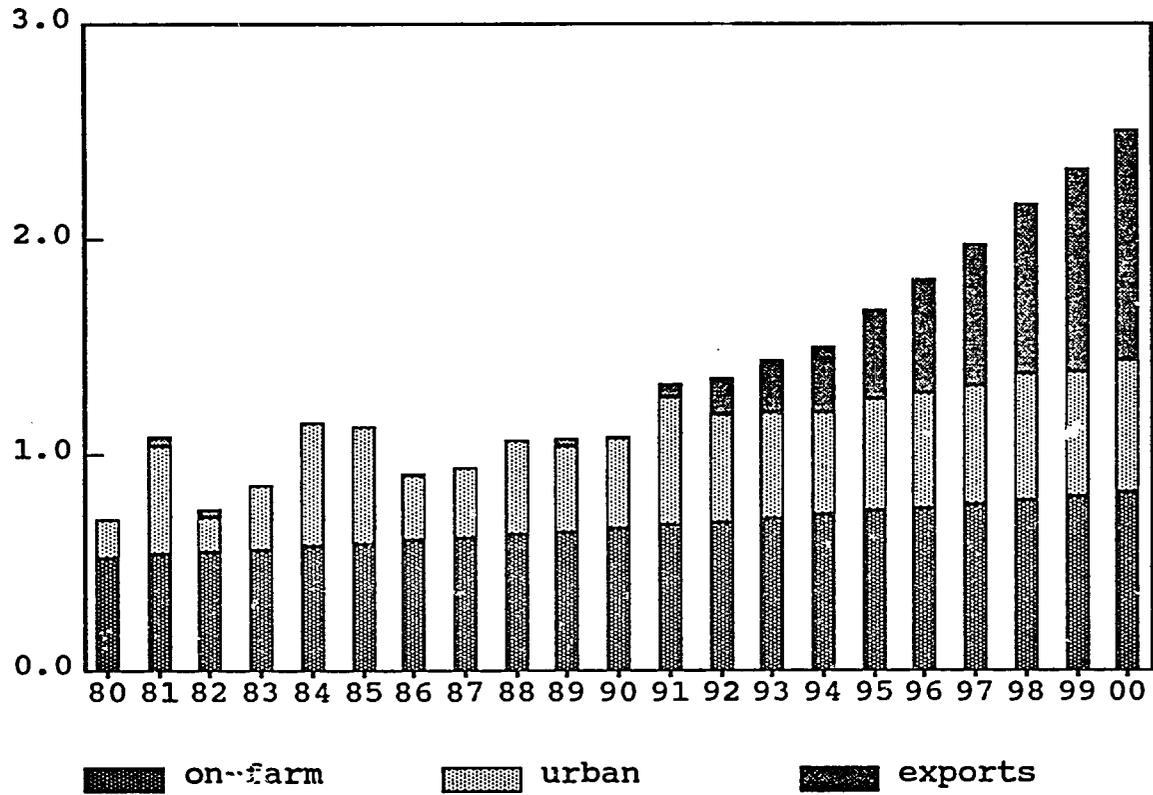


Graph III-29

Edible Beans
Total Market Size

k cwt

Thousands



Edible Beans have desirable characteristics for a crop produced by **small farmers** even in remote areas:

- high value relative to alternative basic grains
- easily preserved
- few economies of scale in growing, post-harvest treatment, and transport

ENABAS historically handled few beans until ordered to supply them to demobilized elements of the civil war armies under the AFA and similar programs. In 1990-91, **ENABAS** marketed beans in the following pattern (expressed as a share of the total domestic market):

March-April	60-70 percent
May-November	20-30 percent
December 1990 to date	symbolic

Only the **godown storage capacity** at the three categories of grain facility managed by **ENABAS** is relevant to bean storage. Total godown storage capacity is 1,151,700 cwt and comprises the following:

- 5 regional elevators (*terminales*) with godown storage capacity of 333,700 cwt. These elevators are located in Managua, Chinandega, San Isidro, Carazo, and near Granada. (There are also two other idle regional elevators.)
- 51 satellite elevators (*Depositos de Almacenamiento Popular*) with godown storage capacity of 618,000 cwt.
- the Los Brasiles elevator with godown storage capacity of 200,000 cwt.

ENABAS's godown capacity was adequate, over the last three years, to store Nicaragua's entire inventory of beans. (Graph III-30)

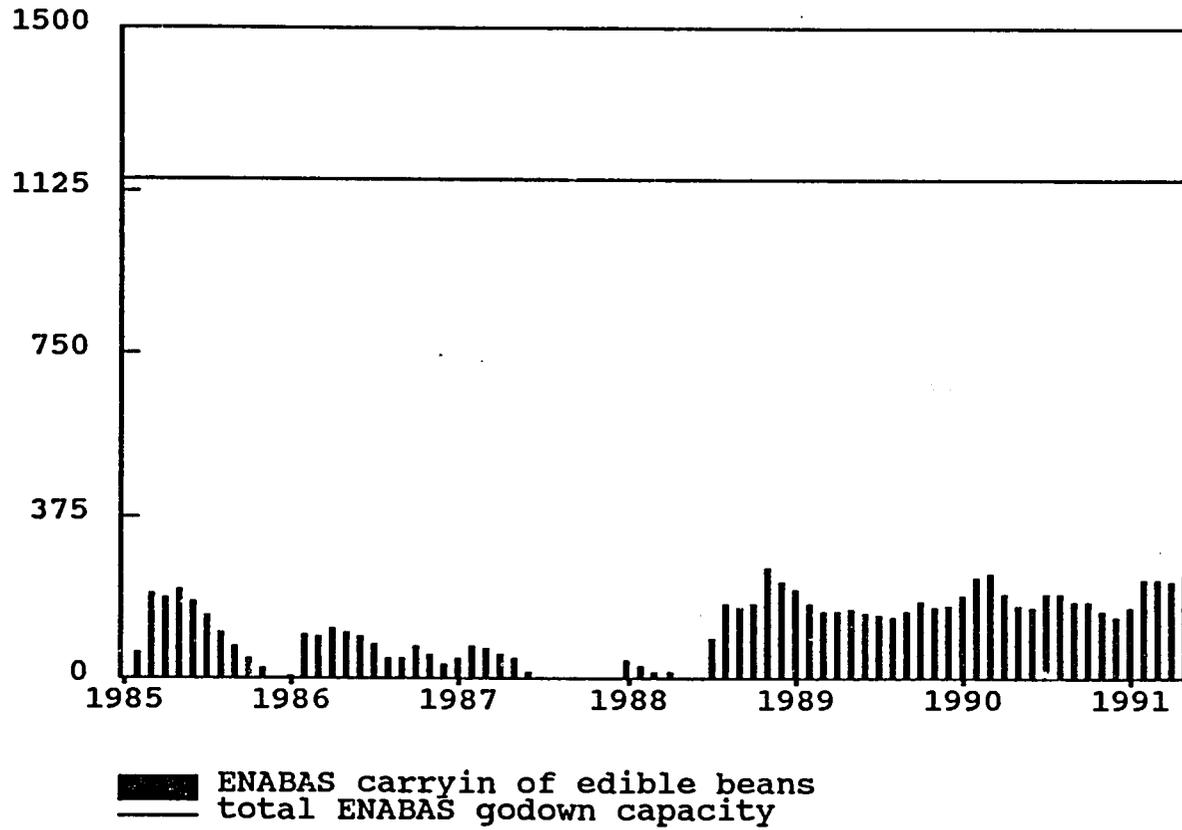
Procurement

ENABAS, over the last three crop cycles, has procured beans in an erratic pattern: modest purchases in 1988-89, almost nothing in 1989-90, then quite active in 1990-91. **ENABAS** entered the 1990-91 crop late, but bought about 60 percent of sales off-the-farm in January, despite the fact that its unadjusted *cordoba* bid had lost value due to inflation. It entered the market again in May. (Graph III-31)

Graph III-30

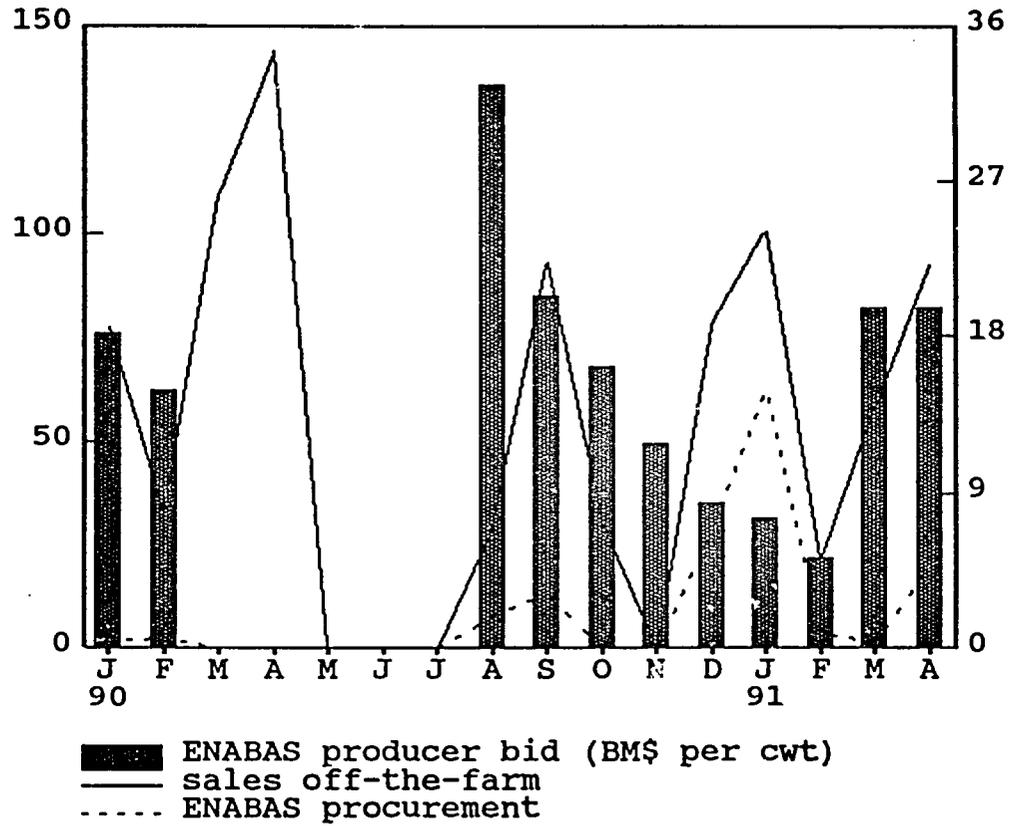
Grain Storage Capacity
(Godowns)

(million cwt)



Edible Beans
National Off-the-Farm Sales & ENABAS...

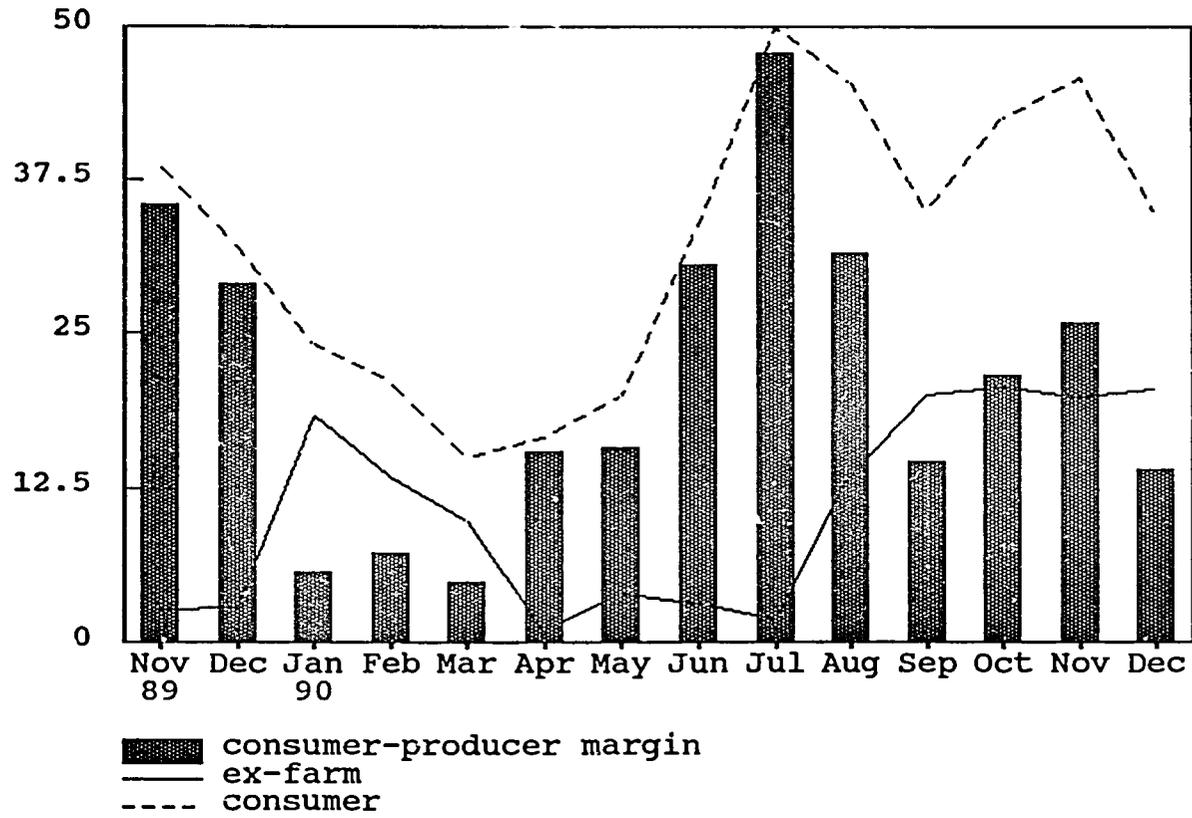
k cwt



Graph III-32

Edible Beans
Prices

BM\$ per cwt



The beans trade within Nicaragua is a cash business typically characterized by wild price fluctuations that make speculation dangerous. The principal obstacle to exports is its legal prohibition--a factor that raises the smugglers' margin at the expense of the producers' price.

Prices

Due to a ban on exports, bean prices are currently depressed at around \$20 per cwt. The cost of landing U.S. *small reds*, (assuming quality were acceptable), would be about \$30, while beans in the San Salvador market have reached \$40.

Over the last year, ENABAS has generally priced its beans slightly above the wholesale market price, except in August 1990 when it lagged the price jump initiated by others. In August 1990, it was bidding a price ex-farm higher than its wholesale sales price! But this nominal bid was not adjusted for inflation. However ENABAS's erratic price behavior is less important in the bean system where it is not normally a dominant player.

Whereas in a typical bean market, the price bid to producers reflects some future wholesale price discounted to cover the cost of storage and finance such that a trader can profitably buy surplus quantities and store them, in Nicaragua only a gambler would act that way. ENABAS's policies fly in the face of market logic. Hyperinflation severely eroded prices that were left uncorrected for several months, then violently raised.

By the same token, it makes no sense to speak of a reseller margin between the ex-farm and wholesale prices. Between November 1989 and December 1990, the gross trading margin ranged from \$3 to nearly \$50 per cwt! (Graph III-32)

2. International Market

Volume

The most promising market for eventual Nicaraguan exports of edible beans is El Salvador. Indeed there is currently pressure on Nicaraguan suppliers to ship to the Salvadoran market despite and export ban.

Estimates of Salvadoran market size are difficult to make, precisely because of illicit cross-border traffic. However, assuming that on-farm/rural *per capita* consumption is fairly stable, the size of this market would be about 70,000 cwt.

If, during good crops, all the volume sold-off-the-farm is consumed, then it appears likely that, in years when the crop is poor, the urban market is supplied from other sources -- including Nicaragua. In 1989, the shortfall appears to have been about

10,000 tons (200,000 cwt). As Salvador's population grows, the urban market seems likely to grow faster than domestic suppliers can increase population.

Price

U.S.A. The market for *small, red* beans is generally at a premium to the price of other beans. Since the popularity of *small reds*, outside Central America, has waned somewhat, it is thinly traded with concomitant price volatility. Graph III-33 shows that the price of *small reds*, ranged between \$25 and \$35. (When considering this price in relation to Nicaragua or El Salvador, the cost of transport to a Pacific Coast port and ocean freight to Central America should be added to this price *FOB dealer*.)

El Salvador. The effect of the short Salvadoran crops in 1985 and 1987 is shown dramatically in the price peaks during the following off-season. Given the vagaries of the climate on the Pacific coast of Central America, it is probable that such shortfalls will recur. A surplus producer would, of course, be well placed to take advantage of high prices. Yet Nicaragua is generally speaking subject to the same vicissitudes as its neighbor to the north.

On balance, the likelihood of a growing market in El Salvador and an international price that comfortably covers Nicaraguan production costs (see section on production later in this chapter) make edible beans an attractive option for Nicaraguan exporters and farmers.

3. Production

Nicaraguan farms have come to be typically divided into the **private sector** and the **reformed sector**, and further into:

- small and medium-sized farms (PMP), including cooperatives
- state farms (APP)

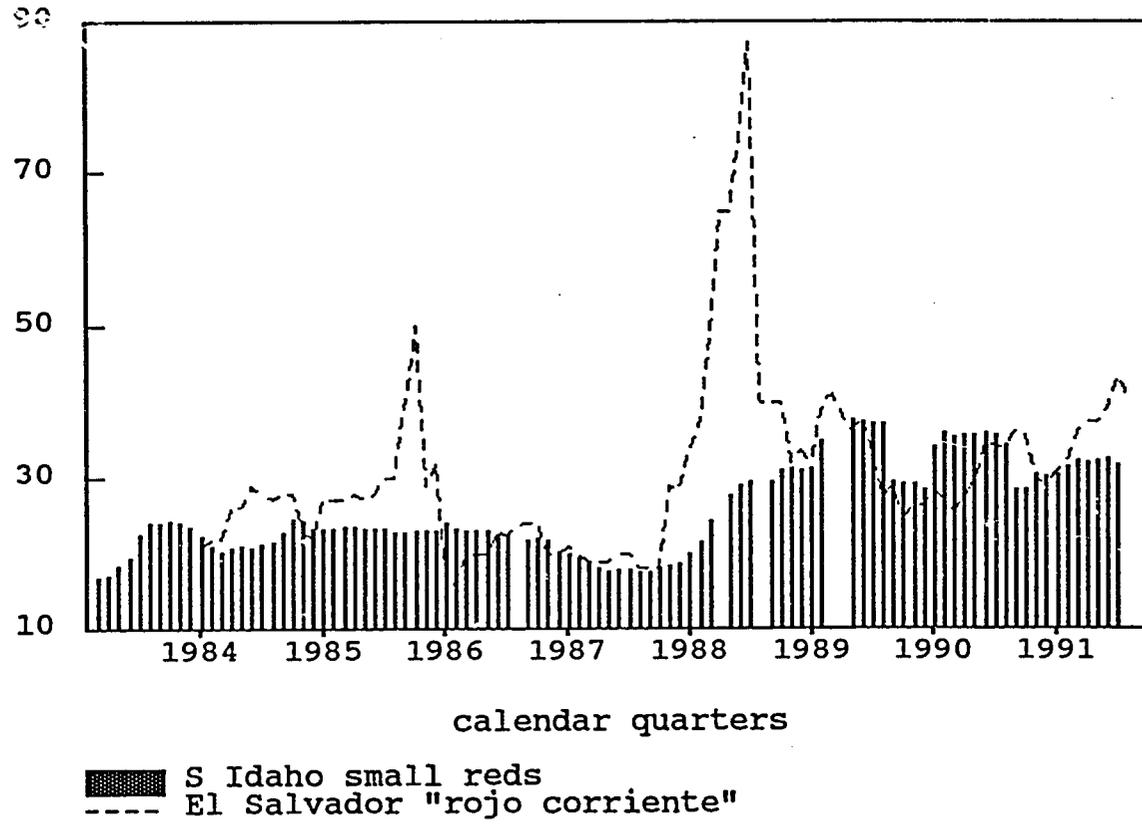
Ninety-nine percent of beans are produced by small and medium farms, (up from 94 percent in 1980), with yields that ranged from 7 to 11 cwt per mz between 1980 and 1990.

One percent of beans are produced by APP farms, (down from 4 percent in 1980), with yields that varied between 8 and 14 cwt per mz in the period 1980 to 1990.

The private sector farms are supplied by private merchants that obtain their products wholesale from the state importing agency, ENIA.

Prices of Edible Beans
South Idaho & El Salvador

nominal dollars per cwt



The reformed sector farms are supplied by both private merchants and by the *Uniones de Cooperativas Agropecuarias* (UCAs). The UCAs perform services for its member production cooperatives comprising (in the following sequence):

- joint procurement of inputs
- joint marketing of surplus production
- joint ownership and operation of handling, storage, and processing facilities

Since the change of government, the UCAs have begun expanding their economic activities as the federal government has discontinued favoritism towards cooperatives. They are also striving to increase the range of services they offer, particularly because they perceive that private merchants are ignoring cooperatives.

It should be noted that the principal attributes of a bean trader are **market knowledge** and access to **working capital**, assets that the UCAs do not currently possess.

Beans are grown, alone or in combination with other crops, especially corn, in varying patterns throughout Nicaragua. In general, beans are planted with the first rains of the year in areas with good drainage, then harvested at the end of the rainy season--the so-called *primera* crop. The *primera* volume is divided three ways: some goes for the farm family's own consumption needs, some goes for seed for the *postrera* crop, and any surplus is sold for cash. Seeds are planted for the *postrera* crop in time to catch the last rains for harvest at the year's end. Almost all the *postrera* production is sold for cash. In other regions, there is an *apante* crop harvested in March and April, as well as a small *verano* crop in June. The share of annual production is:

<u>crop</u>	<u>%</u>
<i>primera</i>	25
<i>postrera</i>	50
<i>apante</i>	24
<i>verano</i>	1

The prevailing ex-farm price of C\$108.60 per cwt easily covers expenses using hand labor and *no till* techniques. All farming techniques would be very profitable at a price reflecting international levels, let alone the Salvadoran price reported above. Income at this level would give an approximate value to land of \$1,000 per *manzana*.

From a national perspective, the *Domestic Resource Cost* calculations, where the *point of competitiveness* equals the exchange rate: C\$5=US\$1, illustrate beans' spectacular competitiveness with imported similars.

<u>farming method</u>	<u>costs per mz</u>	<u>revenue per mz</u>	<u>DRC</u>
hand labor	C\$78.10	US\$163	1.56
using oxen	C\$110.55	US\$118	2.12
using <i>no till</i>	C\$80.75	US\$237	1.02

Off-farm sales will rise from 18,500 tons in 1990 to 53,000 in 1995 (the latter figure inclusive of an exportable surplus). Donations will continue until 1994, and exports will begin in 1995, exceeding 20,000 tons per year by 2000.

4. Summary and Outlook

The urban market is about 20,000 tons and growing at an annual rate of 4 percent. This rate reflects both the rate of urban population growth and the effect of lower personal income (reverse substitution of beef and broiler by the "inferior" beans). The urban market is projected to reach 28,000 tons by 2000.

Domestic production meets on-farm needs of about 30,000 tons, but the surplus sold off-the-farm (about 18,000 tons) is insufficient to supply the urban market. Imported and donated beans, currently 3,000 tons, supply the difference. Donations will briefly reach 10,000 tons in 1991 because of low plantings, a reaction to export prohibition and low domestic prices. Donations will decline thereafter, ending by 1995.

Exports should begin in 1995, and exceed 20,000 tons per year by 2000.

Domestic production costs are low and international prices are projected to remain at attractive levels, albeit in an erratic pattern, over the next decade. Therefore, increasing domestic production represents an ideal option: initially providing cash income to small farm families supplying the urban market, and later bringing in foreign exchange through exports to neighboring countries.

In the medium term, new varieties of beans could be introduced in line with consumer preferences in neighboring countries, for example, the black beans preferred in Guatemala.

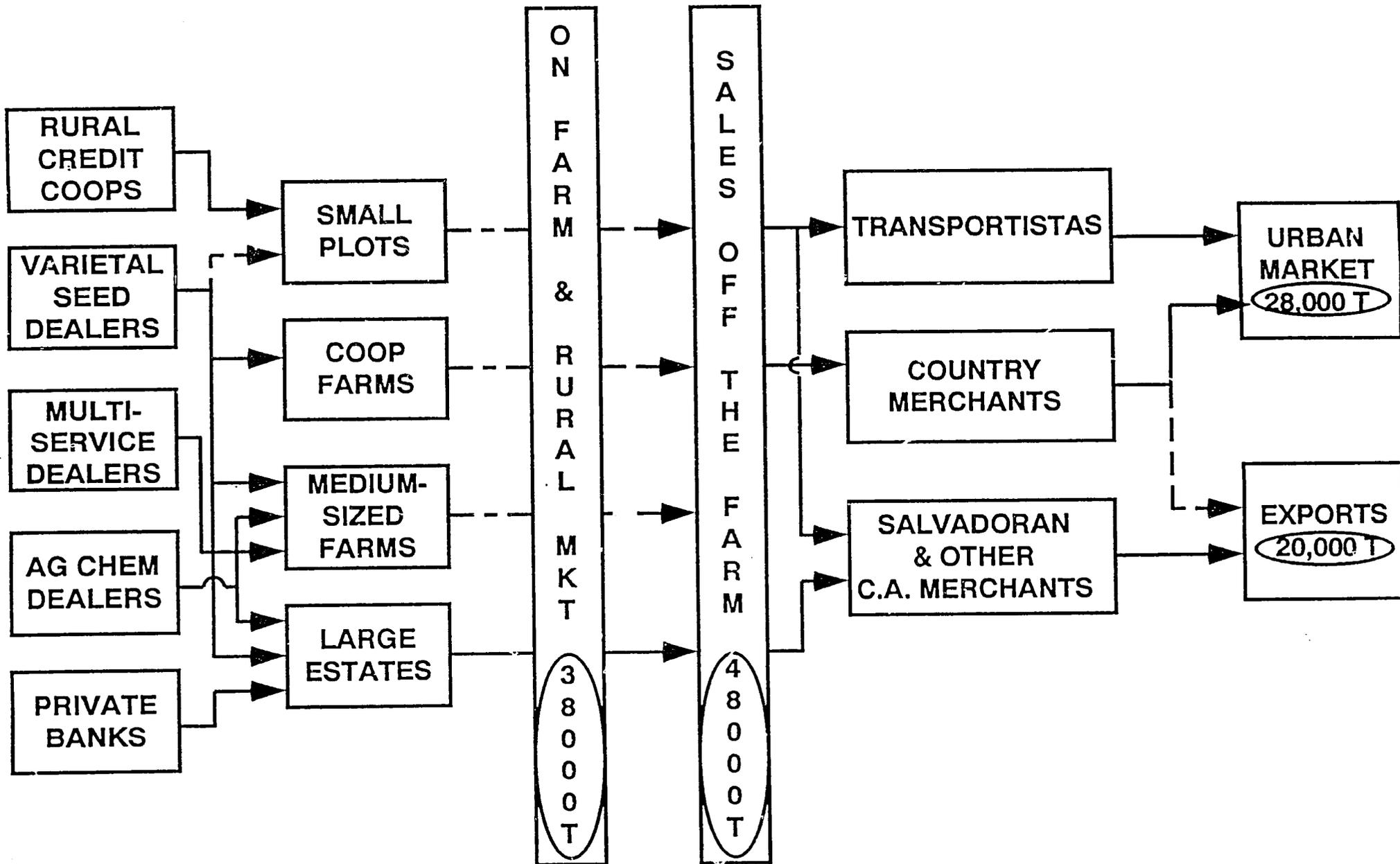
The bulk of the trade in edible beans will be carried on by private merchants since the commodity does not require the services of drying and bulk handling that do corn and sorghum. Consequently, the future fate of ENABAS is not crucial to beans

fortune. The anticipated future structure of the bean system is shown in Graph III-34.

The drought that has reduced the *primera* crop and is thought to presage a short *postrera* crop has paralyzed steps to open Nicaragua's borders with its neighbors until 1992 at the earliest. Thus the anticipated tight domestic bean supply is not being translated into stronger prices that could stimulate increased plantings. Since El Salvador, a consumer of the same quality of *small, red* beans as Nicaragua, also anticipates a short crop, urban prices there are high.

The statist remedy currently in effect treats the Nicaraguan beans system as closed: exports are banned and the domestic price is held down. A possible first step out of this *impasse* would be to encourage imports of U.S., South American, or East Asian *small, red* beans at around the \$30 per cwt level. If the export ban were simultaneously lifted, the domestic price would rise to about \$30, and presumably the export value would stabilize around that value too. While this would probably overcome the threat of shortage and stimulate more plantings in Nicaragua, it could not avoid a significant increase in the price to urban consumers.

Bean System 2000



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100

G. RICE SYSTEM

1. Markets

Nicaraguan rice is produced almost entirely for the domestic market. The total market is estimated at about 95,000 tons, which represents a contraction of about 1 percent per year over the 1980-1990 period. (Graph III-35) Rice was heavily promoted by the government in the 1970s, and continues to enjoy subsidies and price support today. As government intervention is removed, and consumers and producers adapt to lower prices and higher operating costs, consumption is projected to remain level while domestic production drops. Hardest hit will be irrigated farms, but dryland rice hectareage will decline too over the decade.

The rice market can be divided into two segments: on-farm and urban. Compared to other grains, on-farm consumption is relatively low at about 23 percent of the total market (22,000 tons). The urban market is larger but is believed to have expanded at only 0.5 percent per year in the 1980s, in line with increased urban population. Per capita urban consumption is estimated to have fallen 38 percent from about 120 grams per day in the early 1980s to about 87 grams currently. Rice is considered a "superior" food which replaces corn as income rises, but which is superseded in economic hard times when consumers "revert" to corn..

2. Structure

The present structure of the rice system is shown in Graph III-36. Retailers of rice are primarily small stores selling a variety of goods including foodstuffs. In rural areas, local cooperatives operate *tiendas campesinas* that, in addition to farm supplies, carry basic food items for farm families. Rice is sold loose by weight, then dispensed from opened bags in general stores.

At the wholesale level, millers buy unmilled rice (arroz granza) from producers and intermediaries, mill it to remove husk and bran, then merchandise white rice (arroz oro) to the retail trade. The principal entities involved include:

<u>Entity</u>	<u>No. Mills</u>	<u>Milling Capacity</u>	<u>Storage (cwt)</u>	
			<u>Upright</u>	<u>Godown</u>
NICARROZ	6	285,000	369,000	121,000
ENABAS	4	173,000	253,000	250,000
Private	25	554,000	134,000	371,000

ENABAS and NICARROZ mill their rice on a regular monthly pattern, but their share of urban sales varies by season. NICARROZ sold relatively little during

September to December 1989, then began merchandising larger volumes in January 1990. Its market share fluctuated between 10 and 20 percent. ENABAS's market share fluctuated between 20 and 40 percent, but the two combined never supplied less than 40 percent nor more than 60 percent except during the March to May period when they dominated sales.

NICARROZ operates six rice farms (integrated with the mills indicated above) and thus supplies much of its own requirements. ENABAS and the private mills buy from producers and traders.

Prior to monetary stabilization in March 1991, commodity prices were held level in a deflating currency, then violently increased in response to political pressure. For example, in August 1990, they were increased tenfold in anticipation of the new crop. In late 1990, ENABAS's wholesale price was well below the market, but it brought its prices in line after February 1991. As with other grains, the spreads between ex-farm and wholesale prices, and between wholesale and retail prices, show only a general drift, occasionally violated by uncoupled state price interventions (see figures).

There are three categories of rice crops that come forward in the following percentage pattern (based on 1990):

Rice: Percentage of Total Production By Month and Crop

	<u>Dryland</u>	<u>Irrigated</u>		<u>Total</u>
		<u>Winter</u>	<u>Summer</u>	
January		7		7
February		5		5
March		4		4
April		1		1
May				0
June				0
July			9	9
August			7	7
September	11		7	18
October	25		1	26
November	16			16
December		7		7

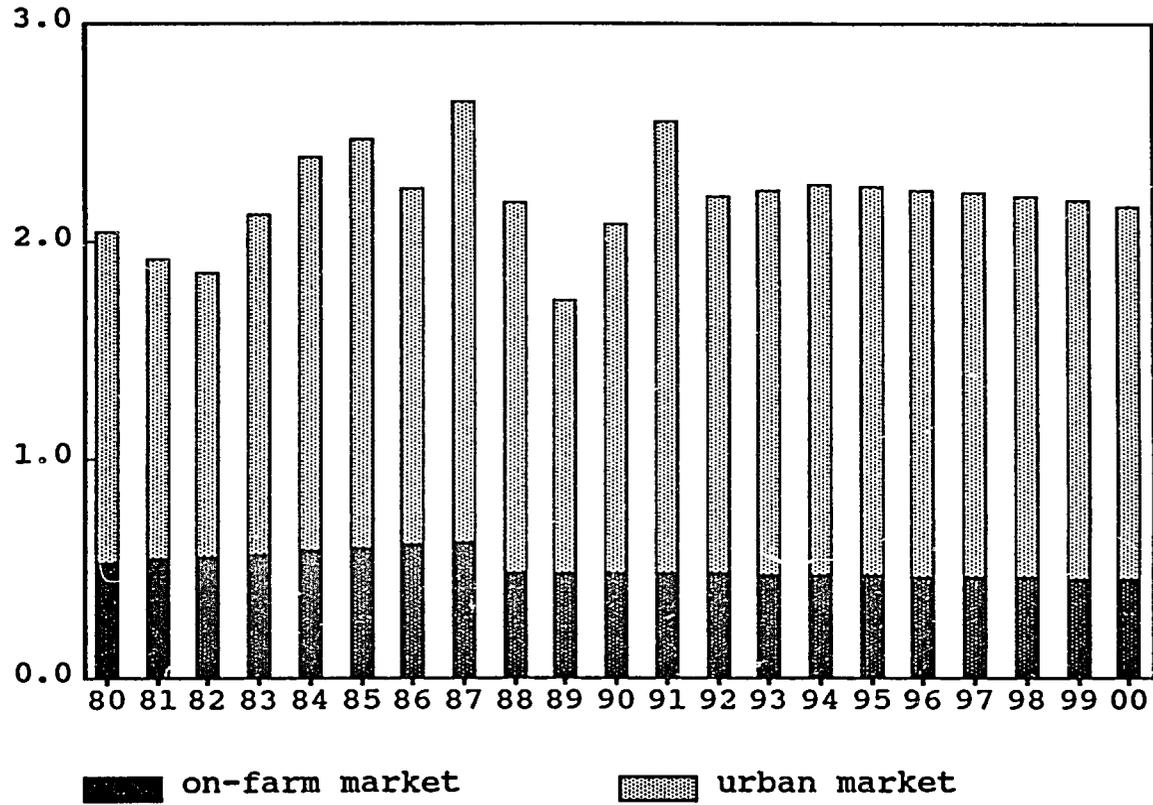
Domestic production meets on-farm needs, but the surplus sold off-the-farm is insufficient to satisfy the urban market. About 27,000 tons of donations have been required to meet requirements. Irrigated rice production has declined. During the 1980s, the large state and private farms (many of them irrigated) produced over two thirds of the output sold off-the-farm. However, the output from both state and commercial farms has been declining, and while dryland production has increased, its lower yields have not fully offset the decline in irrigated production.

Graph III-35

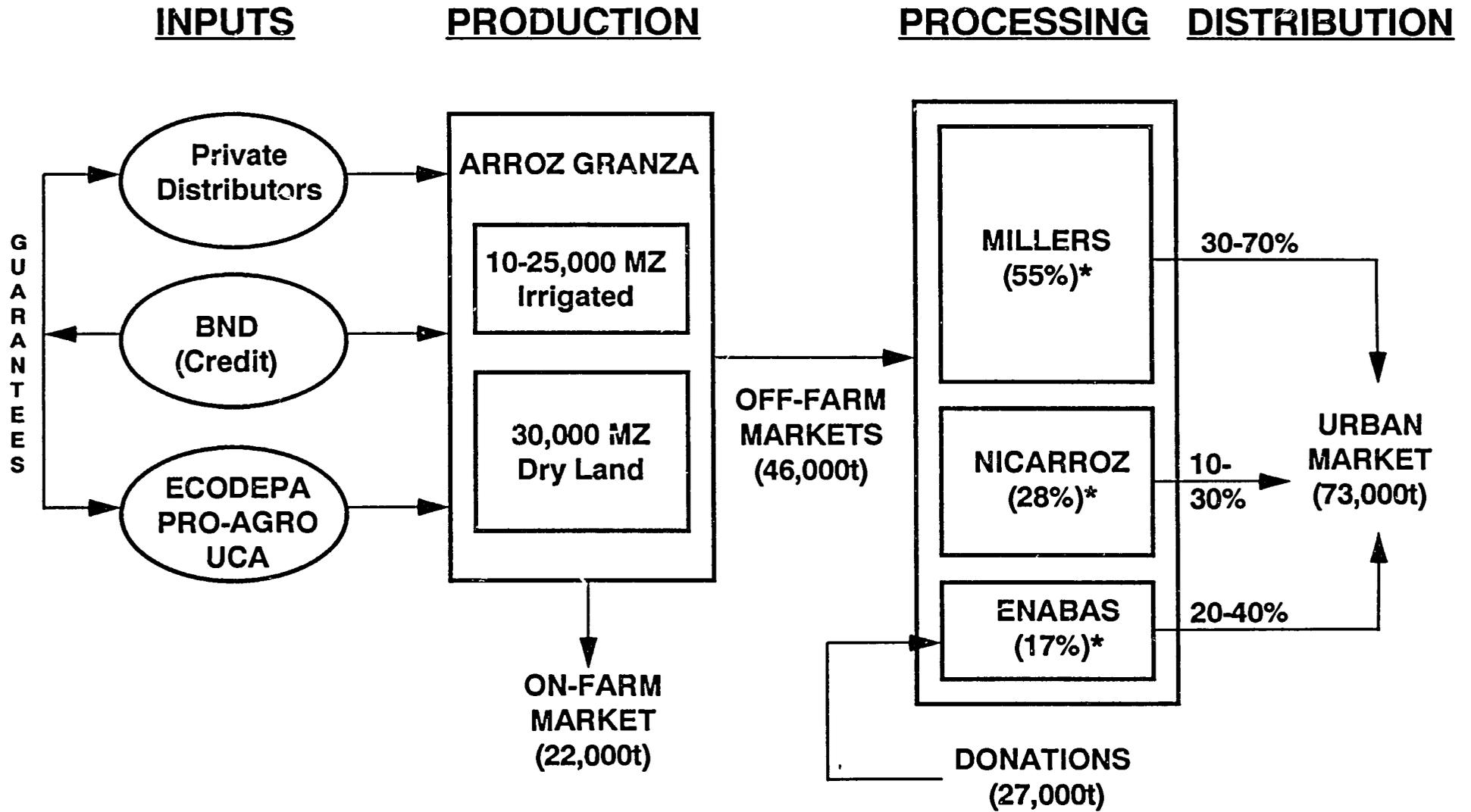
Rice
Total Market Size

k cwt

Thousands



Rice System: Total Market (95,000t)



Yields on irrigated farms peaked in the mid-1980s and have since declined. They range from 25 to 45 cwt per manzana. Dryland rice yields have fluctuated without a clear pattern averaging 20 cwt per manzana.

Irrigated rice area has been declining steadily over the last decade. Current cost data show that production is not profitable, even with subsidized energy costs. Since the government policy is to increase electricity charges to cover utility operating costs in an environment where energy is rationed to households and industry, this poses a serious threat to rice growers in the short term. In the medium term, growers would need to increase productivity by improving yields and reducing costs. The next few years will show whether new varieties and better practices can increase yields. Even if they can, the cost of modernizing equipment is likely to increase costs. Once again one notes the apparent failure of investment in technology to result in a level of productivity high enough to provide adequate return.

3. Production Costs

Fully allocated, engineered production costs reveal that the prevailing ex-farm price of C\$103.60 per cwt covers operating expenses for farming methods using hand labor and oxen, though not large-scale, mechanized irrigation. From a national perspective, the Domestic Resource Cost calculations, where the *point of competitiveness* equals the prevailing exchange rate, illustrate rice's modest competitiveness.

<u>farming method</u>	<u>costs per mz</u>	<u>revenue per mz</u>		<u>DRC</u>
		(domestic)	(international)	
hand labor	C\$85.75	US\$42.74	US\$11.81	3.43
using oxen	C\$70.92	US\$163.58	US\$94.78	2.33
irrigation	C\$113.86	-US\$86.52	-US\$194.83	5.24

These calculations take no account of the effects of continuous cropping of rice, the deterioration of equipment, and the variability of crop yield. In order for Nicaraguan producers to be competitive, their productivity would need to increase, in particular their yields.

<u>farming method</u>	<u>required yields</u>	<u>current yields</u>
hand labor	14 - 20 }	PMP: 20
using oxen	16 - 22 }	
using tractors	55 - 70	{ AP: 28 - 45
		{ APP: 25 .. 40

Considering Nicaragua's limited resources and alternative agribusiness options, significant investment in irrigated rice represents a high-risk option with limited chances of success.

4. Outlook and Issues

The domestic resource costs for irrigated rice are not favorable. It is estimated that yields would have to be 70 quintales per manzana in order for rice to be internationally competitive at the current exchange rate. Even at an exchange rate of C\$8 (the so-called "equilibrium" exchange rate) yields of 55 quintales would be required. Historical records show that AP farms on average reached a yield of 69 cwt per manzana in 1982, but the current figure is in the low 40s, nearly 40 percent lower. The state-owned farms on average never exceeded 65 cwt per manzana, but their 1989 average of 55 cwt would have been competitive at the equilibrium exchange rate. (Graphs III-37-40)

The foregoing analysis refers to average yields. Assuming a normal distribution of costs and yields, about half of the production units would be to the right of the average. That is to say, if on average a group is barely competitive, then half of the units in the group are not.

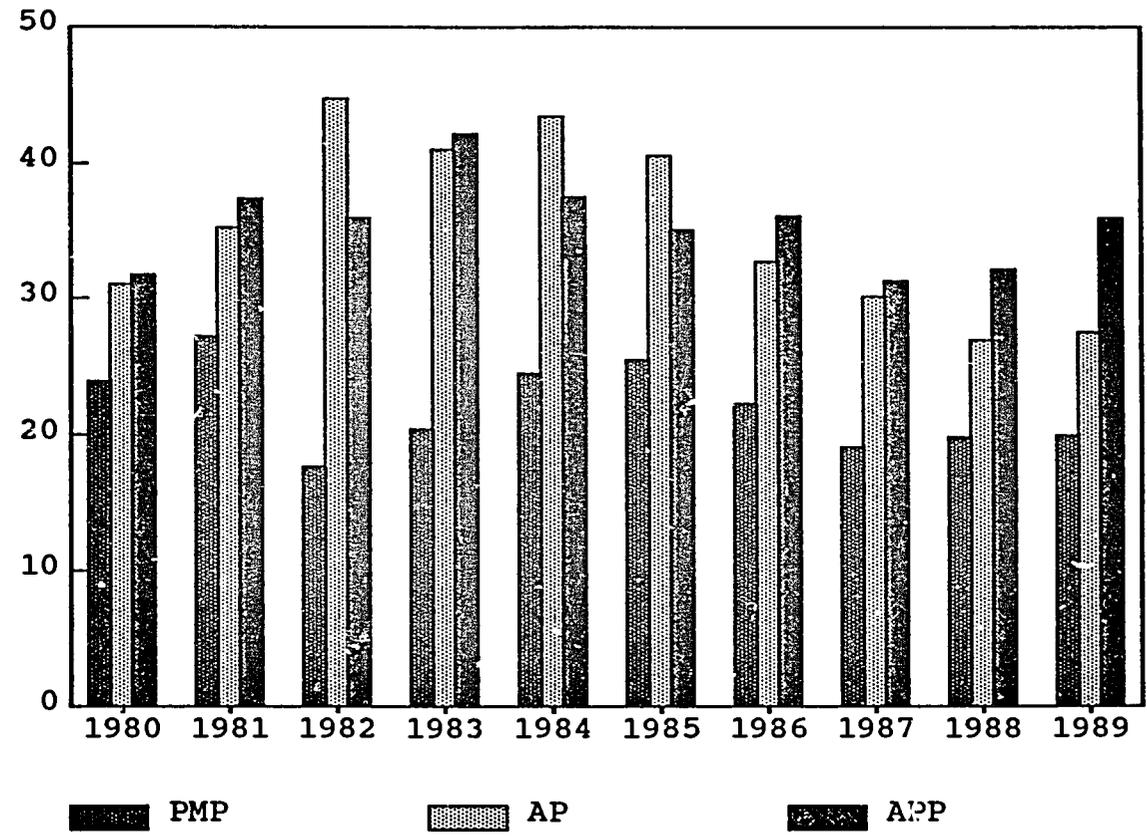
This distribution issue also applies across years. If a crop is produced competitively on average, but there is significant variance in yields from year to year, then the risk attached to that crop is high. The standard deviation on the rice yield, in common with other crops produced on the Pacific plain, is high at 4.3 cwt per manzana.

Dryland rice using hand labor and oxen is marginally competitive at current exchange rates, and fairly competitive at a more realistic exchange rate. However, upland rice is likely to persist as a cash crop only so long as the domestic price is at a premium over corn and beans. In a liberalized price environment, it is expected that many small producers would shift from rice to beans in a rotation with subsistence corn.

The challenge will be to identify high value crops that can utilize (and pay for) the irrigation infrastructure currently used for rice. Some experiments have been conducted with melons (see melon section), but these have not yet been particularly successful. Much more investigation is required to identify appropriate substitutes.

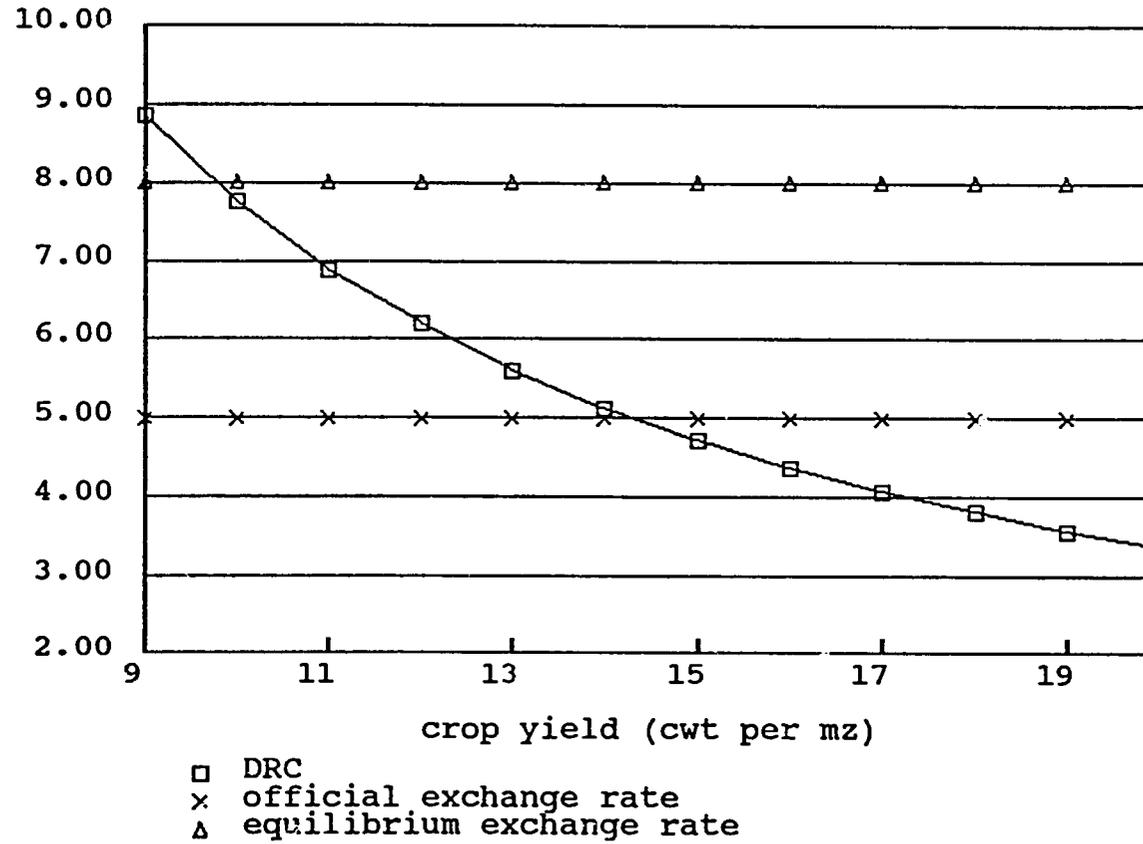
Rice
Yields by Producer Type

cwt per mz



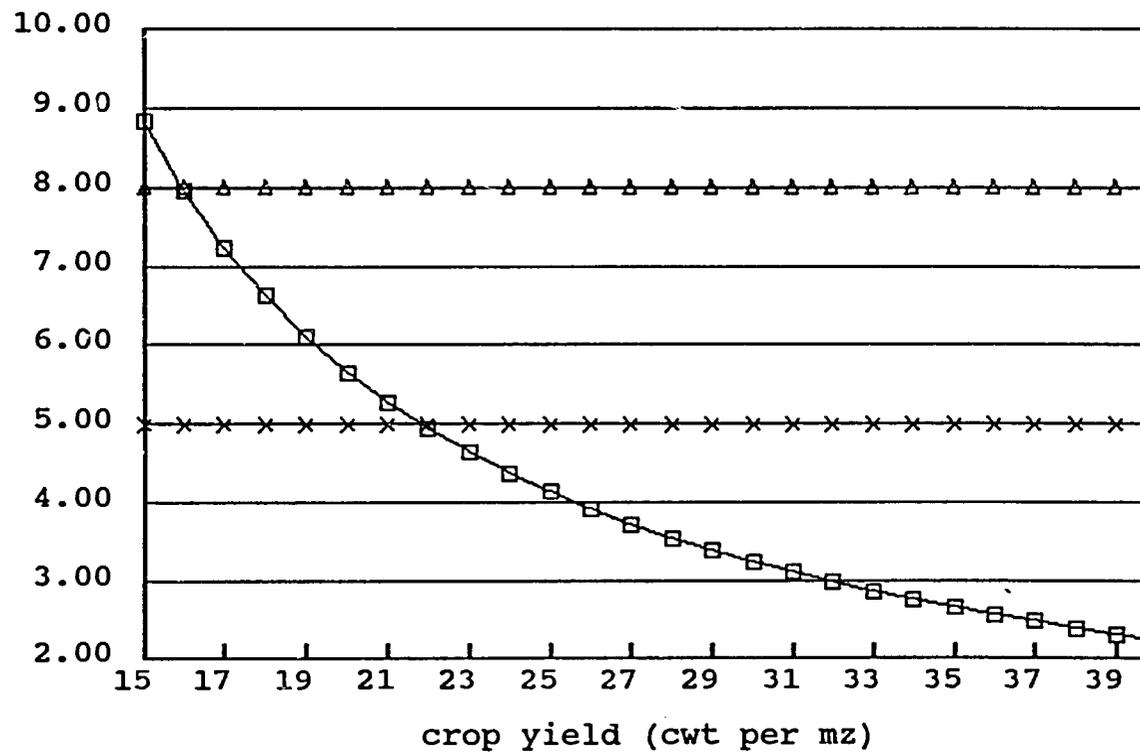
Graph III-38

Domestic Resource Cost as a Function of Yield
Rice (Using Hand Labor)
Cordobas per \$



Domestic Resource Cost as a Function of Yield
Rice (Using Oxen)

Cordobas per \$

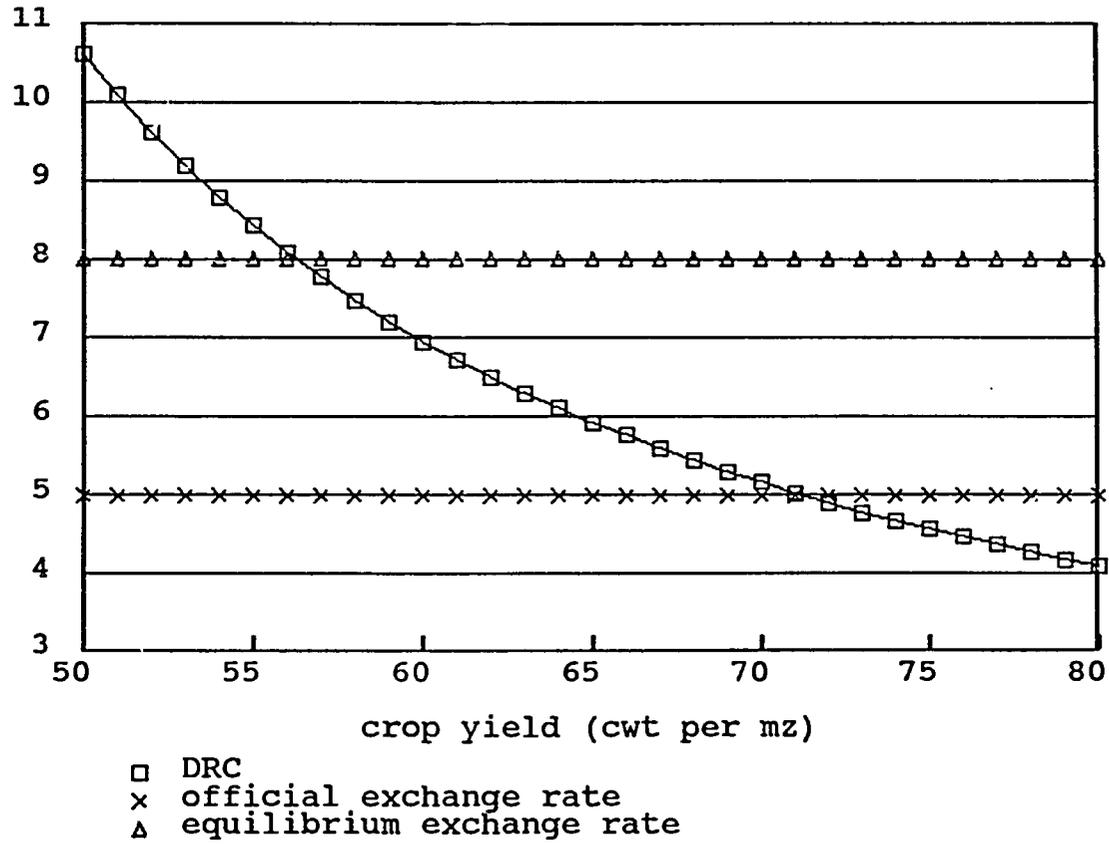


□ DRC
x official exchange rate
△ equilibrium exchange rate

Graph III-40

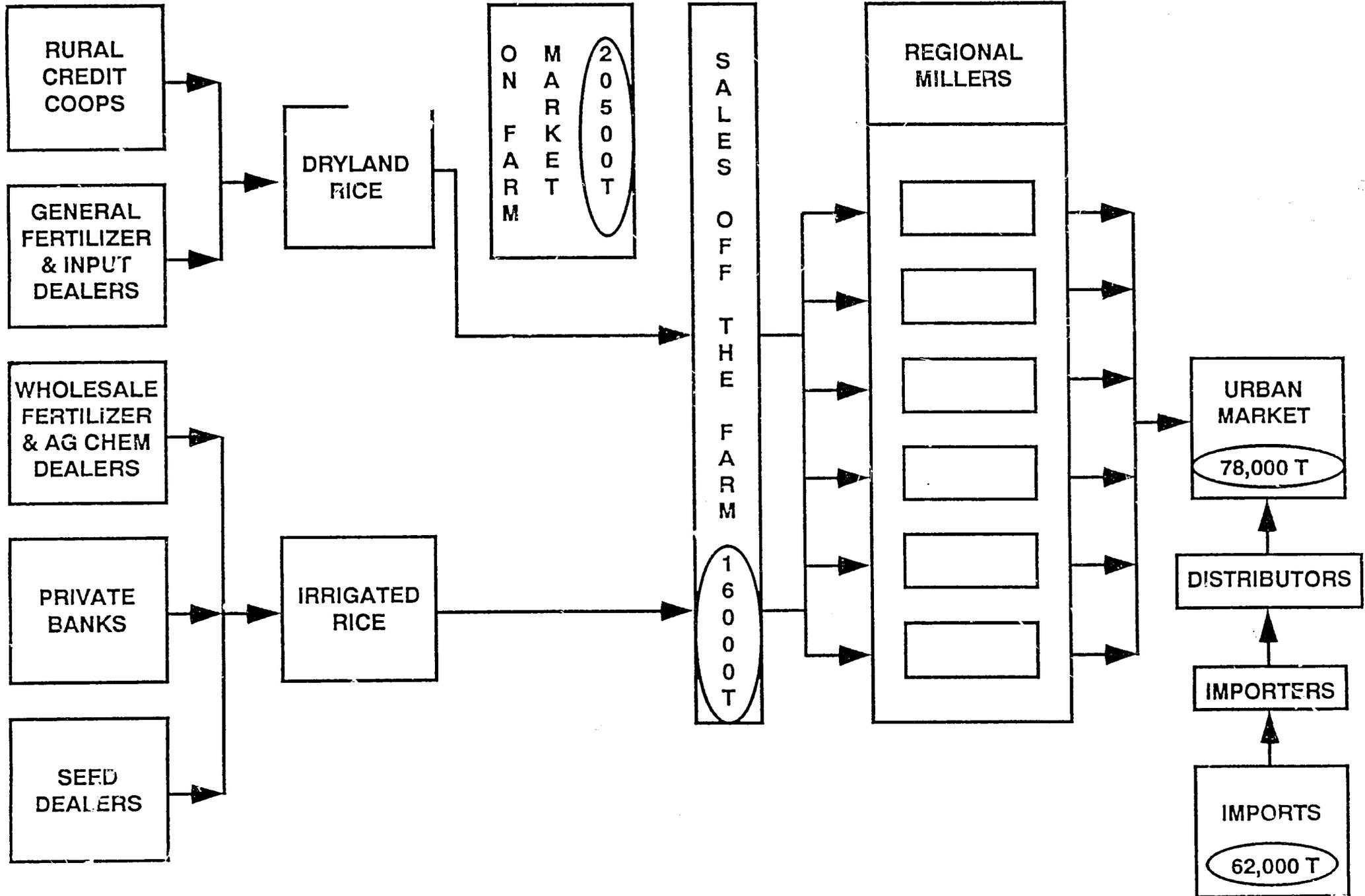
Domestic Resource Cost as a Function of Yield
Irrigated Rice

Cordobas per \$



The final issue is the disposition of the state entities. In the case of ENABAS, there is no particular reason for it to be in rice milling and trading, especially given the large number of private mills. It should sell off its mills and exit the business. The privatization of NICARROZ is somewhat more complicated given the poor economics of the rice business. However, the sale of its assets, especially the land with its infrastructure, could attract investors (local and foreign) into new types of products. The anticipated future structure of the rice system is presented in Graph III-41.

Rice System 2000



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H. SORGHUM SYSTEM

2. Introduction Structure

Sorghum is the second most important basic grain in Nicaragua, produced by nearly 3,800 farmers on 45,000 ha in 1990. Three varieties are produced: industrial sorghum (about one-half of the harvested area), millon (about four-tenths of basic grain area), and white sorghum making up the balance. Industrial sorghum is used primarily for animal feed, and provides most of the high-carbohydrate feed consumed in Nicaragua. It is the primary feedstuff used by the poultry industry, for example. Millon and white sorghum are produced for food, and are consumed largely in areas where they are grown.

Industrial sorghum tends to be produced on larger scale farms with commercial inputs, and has much higher yields than either millon or white sorghum (31 qq/mz in 1989 for industrial sorghum, compared with 15 qq/mz for millon and 21 qq/mz for white sorghum). (Graph III-42)

In spite of industrial sorghum's importance in Nicaragua, most sorghum farms are small and privately owned. State farms and cooperatives accounted for just under one-fourth of the sorghum area in 1989, with 73 percent large and small commercial farms. Of these 2691 private farming operations, 356 were classed as large, commercial operations while the balance were small and medium producers.

Structure of Sorghum Farming, 1989

	<u>Number</u>	<u>Area</u> <u>(mz)</u>	<u>Average</u> <u>(mz/farm)</u>	<u>Share</u> <u>(%)</u>
State Farms	16	6,300	393	9
Commercial farms	1,691	52,300	19	73
Cooperatives	<u>729</u>	<u>12,900</u>	<u>18</u>	<u>18</u>
Total	3,793	71,500		100

Differences in resource use and productivity of traditional and mechanized producers is dramatic. Mechanized producers' costs are nearly C\$1200 per mz (1990), with 21 percent of the total for machinery and another 36 percent for fertilizer, pesticides, seed and other inputs. Traditional producers, by contrast, use no machinery and few inputs, and their costs are just over one-third those of the mechanized producers (with 94 percent of the total for hand labor for soil preparation and harvesting). However, traditional producers' yields are low (less than one-third those of mechanized producers) so that in spite of their low production costs, costs per qq of sorghum are only slightly lower for mechanized

producers . In general, sorghum productivity has been declining by small amounts during the decade. Yields averaged 1.9 mt/ha in 1990, down somewhat from the 2.03 mt/ha of mid-decade, trends that appear to reflect a lower proportion of industrial sorghum, rising costs of inputs, and market uncertainty.

The overall prosperity of the industrial sorghum subsector is tied closely to the growth of its principal market, poultry meat. During the mid 1980s, when poultry meat and egg production were growing rapidly, sorghum feed use was growing rapidly, as well. However, poultry meat production declined very sharply during the 5 years 1984-89 (by more than 50 percent), a pattern that has significantly affected Nicaraguan sorghum demand and production.

Use of sorghum for food grew steadily during the 1980s, to 78,000 mt by 1989. During the mid-1980s, food and feed consumption was roughly even; however, since 1986, food use has grown steadily and has been generally above 60,000 mt even during years when total consumption was down sharply. Most of the variation since 1986 has been in feed use, which has declined steadily by more than 60 percent from the 1987 level.

While sorghum is regarded as a very different commodity than corn in Nicaragua, its food use role is similar (although most sorghum foods are consumed on farms and in rural areas, rather than sold commercially in the cities). In addition, sorghum prices tend to be similar to those for corn (about C\$ 40/qq at the present time), as are yields for the various levels of mechanization. However, sorghum production costs are much lower (25 percent lower for mechanized producers; 20 percent less for those who depend partly on machinery). As a result, sorghum producers with average unit costs (or lower) and producers who receive market prices as high as those for corn have significantly higher profits.

In general, sorghum production is profitable since producers are covering average production costs. However, Nicaraguan sorghum is not competitive in world markets (about 8 to 10 percent below world price levels) at the official exchange rate. (Table III-19)

2. Sorghum Outlook

Sorghum appears to be generally profitable in local markets at the present time, but that market is severely constrained by low consumer demand (particularly for poultry meat) and the absence of an export market.

In general, Nicaraguan sorghum producers face three markets:

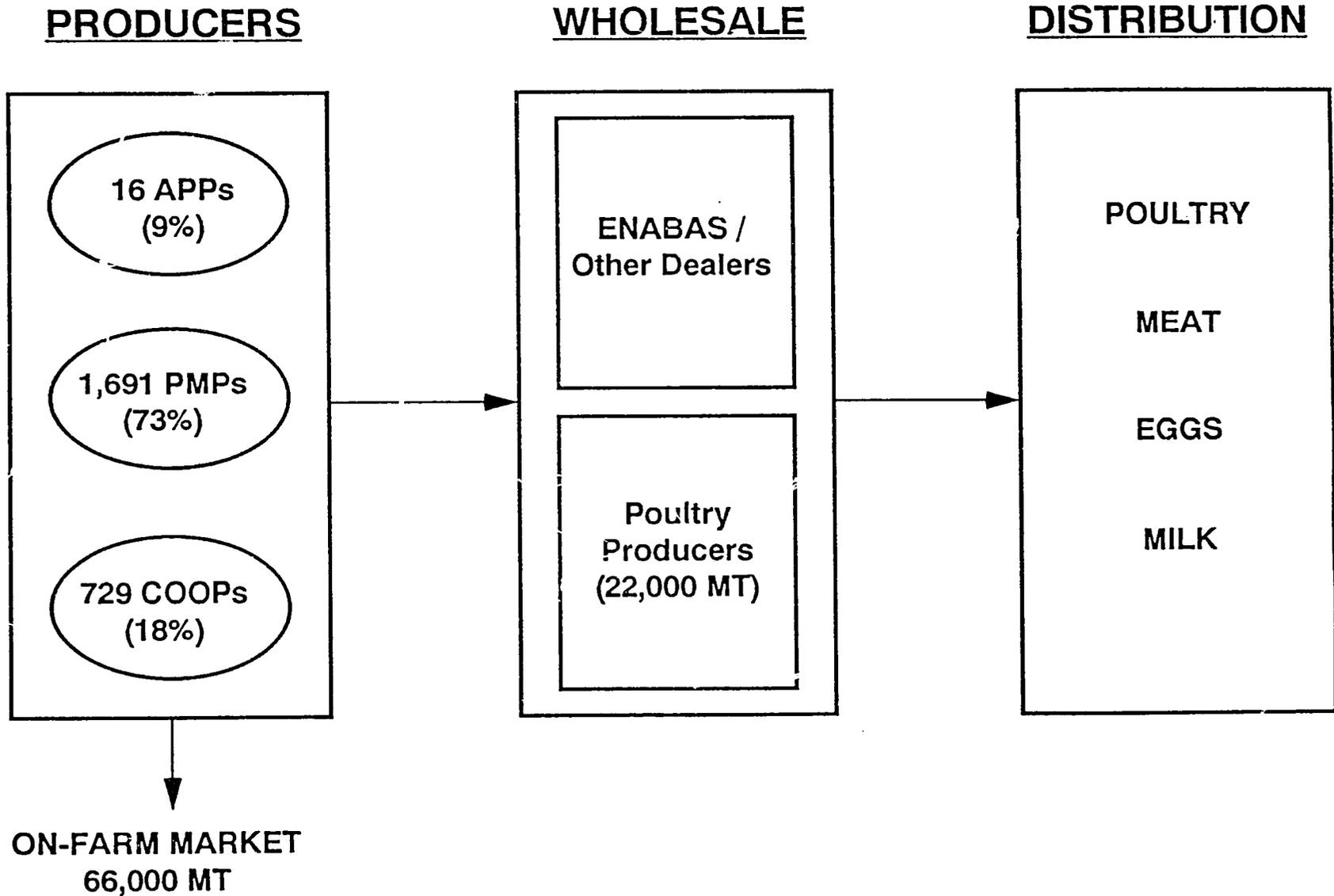
- Domestic food-use market, growing with population (expected to decline slightly with income growth);

Table III-19

SORGHUM COST OF PRODUCTION

	<u>Mechanized</u> <u>(c\$/mz)</u>	<u>(%)</u>	<u>Traditional</u> <u>(c\$/mz)</u>	<u>(%)</u>	<u>With Oxen</u> <u>(c\$/mz)</u>	<u>(%)</u>
Machine Labor	244.8	20.5	0.0	0.0	112.48	12.1
Hand Labor	18.76	1.6	169.8	53.5	241.68	26.0
Services	152.33	12.7	0.46	0.1	5.2	0.6
Infrastructure	3.81	0.3	3.81	1.2	3.81	0.4
Administration (6%)	73.62	6.2	0.0	0.0	385.06	41.4
Inputs	434.27	36.3	14.7	4.6	0.0	0.0
Harvest/Storage Costs	268.88	22.5	128.74	40.5	180.75	19.5
Subtotal	1196.27	100.00	317.51	100.0	928.98	100.0
Yield	50		15		40	
Costs/qq	23.93		21.17		23.22	

Sorghum System



- Domestic feed-use, responding primarily to growth of the local poultry meat and egg markets (responds quite positively to income growth);
- Regional feed-grain market.

Commercial producers depend heavily on imported inputs and machinery, so that adjustments in the exchange rate that make Nicaraguan sorghum more competitive are likely to increase production costs sharply, as well. However, commercial producers appear to have significant potential to increase yields. U.S. producers average 3.9 mt/ha under generally rain-fed conditions, three times the Nicaraguan yield; mechanized producers in Nicaragua achieve about 85 percent of U.S. average yields.

In spite of the fact that mechanized sorghum production depends relatively heavily on imported inputs, domestic resource use per unit of foreign exchange saved/earned is relatively favorable (about C\$4.3), implying a savings in foreign exchange from sorghum exports even at current exchange rates. While Nicaraguan sorghum is not competitive in foreign markets at the present time, its prices are close to world levels and sorghum likely could be sold profitably in some regional markets, a practice that would be expected to benefit both local producers and earn badly needed foreign exchange for the Nicaraguan government.

Among Nicaraguan basic grains, sorghum is one of the best positioned to expand. It has large potential markets as a food grain, a feed ingredient for the poultry sector (and for dairy) and, perhaps, as a grain export commodity although to compete profitably in the latter market, yields must be increased or costs reduced. As a result, sorghum production could expand significantly during the 1990's, perhaps to as much as 91,000 ha (about one-half the area planted to corn). This expanded area plus a modest 1.7 percent annual increase in yields during 1995-2000 would more than double production between 1990 and the end of the decade.

In spite of its current positive returns, rapid expansion of sorghum production depends critically on Nicaraguan producers' capacity to increase yields and reduce production costs, and on the growth of domestic poultry markets. The domestic poultry industry declined sharply during 1988-90, but has been expanding once again in recent months. Markets for poultry meat likely are very sensitive to disposable income trends, and could grow rapidly in response to even small increases in economic growth.

However, the greatest market potential for sorghum production growth may be the regional export market. Generally deficit in feed grains, the Central American market imports grains from the United States (564 tmt in FY 1990) plus small, sporadic intra-regional sales. While this market is primarily corn and includes

important amounts of concessional or donated products, it likely will expand and become more commercial as the region develops.

To compete in the world export market, Nicaraguan sorghum producers will need to increase yields 10 percent or more without increasing production cost per qq. Given that the current 45 bushel per manzana yield for mechanized producers is low compared to both regional and world competitors, productivity increases as great as 5 qq per mz (or more) would seem entirely possible given access to better varieties and other inputs.

Sorghum production in Nicaragua is primarily by moderate sized private commercial farmers (73 percent, averaging 19 ha per farm). Given access to competitively priced credit and inputs, this subsector would be expected to respond relatively quickly to favorable economic incentives to both expand production and increase yields.

I. POULTRY SYSTEM

1. Introduction Structure

Nicaraguans consumed about 69.1 million pounds of meat in 1990, about 36 percent in the form of chicken, a slightly smaller amount of beef and somewhat less pork (just under 30 percent of the total). Beef production is more than three-fold that of chicken, but two-thirds of the beef is produced for export. The nation is self-sufficient in poultry, by contrast, and all domestic consumption is consumed locally. During 1980-87 poultry production (and consumption) grew very rapidly (5.1 percent annually) while egg production increased an average of 4.3 percent per year. (Table III-20)

As shown in Graph III-43, the poultry industry in Nicaragua is heavily concentrated in two firms, Tip-Top (the largest by far, with 84 percent of total production in 1989) and Estrella Avicola. State farms formerly produced significant amounts of poultry (30 percent of the total in 1987), but ended production in early 1988.

Modern, efficient poultry production depends on the availability of high quality genetic stock, carefully balanced feeds and quality veterinary/biological services and products. In Nicaragua, most of the grain used for poultry production is produced domestically, but the bulk of the protein meal (used to supplement locally produced, high carbohydrate feeds), the fertile eggs (or starter chicks), and veterinary/biological supplies are imported. As a result, production costs are highly sensitive to exchange rates as well as international prices.

About 8.5 pounds of concentrate feed is required to produce each broiler (at an average 2.8 pound weight in Nicaragua), just over 3 pounds of concentrate feed per pound of poultry produced. The average production period is about 42 days. Just under two-thirds of each pound of concentrate fed is domestically produced sorghum (63 percent), but much of the 36 pounds of protein meals is imported.

Several GON economic policies helped stimulate poultry production in the mid-1980s:

- GON regulated sorghum and poultry meat prices that provided attractive price/cost spreads;
- Subsidized interest rates and readily available credit for investment in facilities and production;
- An enormously overvalued exchange rate subsidized imports of fertile eggs (or starter chicks), high protein meals, veterinary biologics, and other products necessary for poultry production.

Table III-20

POULTRY-EGG SUPPLY/USE BALANCE

FOOD BALANCE	<u>1980</u>	<u>1981</u>	<u>1982</u>	<u>1983</u>	<u>1984</u>	<u>1985</u>	<u>1986</u>	<u>1987</u>	<u>1988</u>	<u>1989</u>	<u>1990</u>
POULTRY (mil lbs.)											
Stocks											
Production	19	24.4	22.3	23.6	23.1	22.6	22.6	26.9	22.9	11.9	26
Commercial Imports											
Donations											
Total Supply	5436.2	7032	6402.8	6753.6	6587	6438.2	6414.2	7605.1	6453.6	3349.9	7272.4
Human Consumption	18.4	23.7	21.6	22.9	22.4	21.9	21.9	26.1	22.2	11.5	25.2
Animal Consumption											
Losses	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.7	0.4	0.8
Exports											
Stocks											
Total Utilization	19	24.4	22.3	23.6	23.1	22.6	22.6	26.9	22.9	11.9	26
EGGS (mil doc.)											
Stocks											
Production	25.4	33.4	39.3	40.6	4.9	45	44.4	34.4	28	33.1	26
Commercial Imports											
Donations											
Total Supply	25.4	33.4	39.3	40.6	4.9	45	44.4	34.4	28	33.1	26
Human Consumption	25.2	33.1	38.9	40.2	41.5	45.3	44	34	27.7	32.8	25.7
Animal Consumption											
Losses											
Exports											
Stocks											
Total Utilization	25.2	33.1	38.9	40.2	41.5	45.3	44	34	27.7	32.8	25.7

Not only did poultry production increase in the state owned production facilities and the large private firms, but large numbers of small, private producers began to invest in order to take advantage of the industry's low capital requirements and high returns. By 1987, an estimated 1600 poultry farmers were in operation. Many of these were relatively inefficient operations, requiring up to 12 pounds of concentrate feed per bird (4.28 pounds of feed per pound of poultry meat), 30 percent more than the more efficient producers.

In 1988, new exchange rate and credit policies dramatically changed the outlook for the industry.¹⁵ In response to a virtual collapse of the economy, the government introduced a broad range of new policies to curtail government costs and inflation, measures that both reduced demand for poultry and increased production costs by reducing subsidies.

The national economic situation in 1988 was characterized by hyperinflation (14,500 percent annual rate), 27 percent unemployment and a 42 percent reduction in real salaries and demand for poultry meat collapsed, as it did for most high protein food products.. At the same time, production costs were increased by rising real interest rates. New government credit rules made investment difficult.

The value of the cordoba fell dramatically during 1988-90, reducing import subsidies and raising prices (The C\$/U.S. dollar rate increased 173 percent in 1988 and 8,098 percent in 1989 and 4,308 percent in 1990). For example, the number of pounds of broiler meat required to purchase 100 pounds of concentrate feed increased from just over 12 in early 1988 to more than 33 by October, and ranged from 14.5 to nearly 30 in 1989 before declining to the 12 to 15 pound level by the end of 1989.

The result has been a severe cost/price squeeze and sharp retrenchment by the industry. The number of small producers declined from 1600 in 1986 to 700 in 1988 (and to an estimated 40 by the end of 1990).¹⁶ In 1989, poultry production declined to 11.9 million pounds, less than one-half the 1987 level (and consumption per person fell to just over 3 pounds per year, about 40 percent of the 1987 level). However, in 1990, production once again exceeded that of 1988 as grain prices and producer margins stabilized somewhat.

¹⁵ The nominal C\$ per U.S. dollar rate was held fixed during 1980-84 at C\$10/US dollar. In subsequent years, the rate was:

1985	27 C\$/dollar;
1986	67 "
1987	70 "
1988	191 "
1989	15,658 "
1990	690,180 "

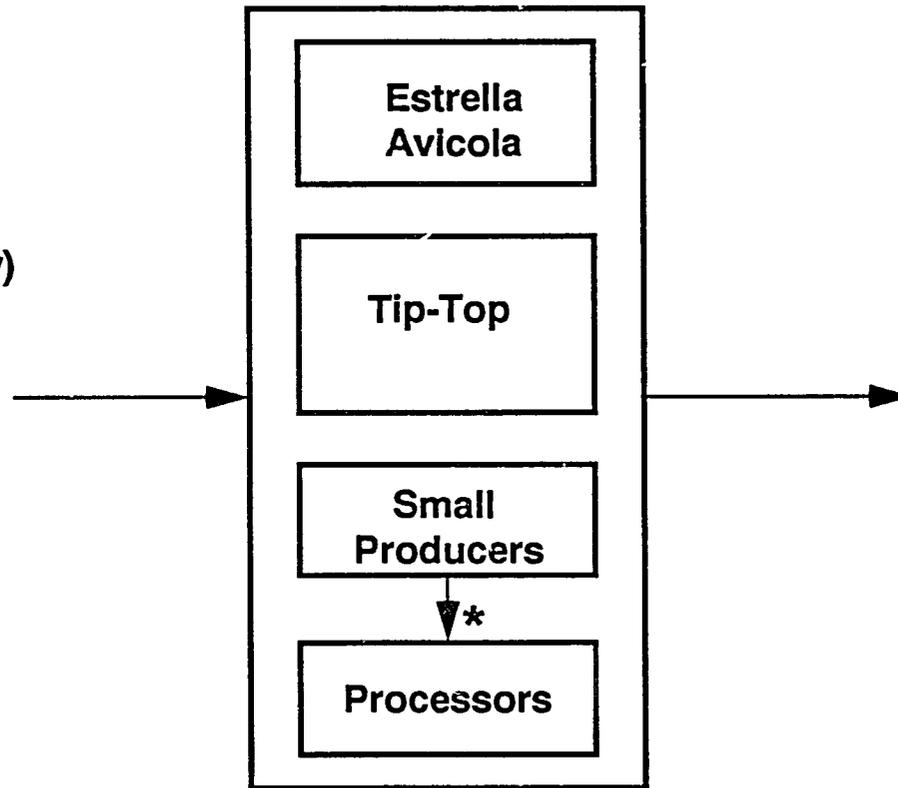
¹⁶ Association Nacional de Productores Avícolas.

Poultry System

INPUTS

- Day old chicks/
fertilized eggs
- Compound feeds
(8.5 lbs/bird
- 3 lbs/lb poultry)
- Sanitary / vet
products
- Facilities
- Administration
- Labor
- Capital

FEEDER/PROCESSOR/SLAUGHTER



DISTRIBUTION

URBAN MARKET
25 million lbs poultry
26 million eggs

* About 40 small poultry producers sell to large processors.

2. Outlook

The outlook for poultry production continues to be clouded by several factors:

- Efficient poultry production depends on the availability of abundant supplies of high carbohydrate feeds, high protein supplements, and quality starter chicks (or fertilizer eggs) and veterinary biologics. To the extent these can be produced locally using domestic resources, hard currency costs are avoided and the competitive position of the poultry industry is enhanced.
- Current GON policy is reportedly to encourage production of poultry for domestic consumption so that domestic beef consumption is minimized and export availability maximized.
- Given access to imports of high quality genetic materials and adequate feed supplies, the Nicaraguan industry appears to have the potential to be relatively competitive with international producers, based on feed conversion ratios and growth rates. Whether it could be competitive over the long run likely will depend on levels of effective competition in Nicaragua (and the extent to which investment is available to increase productivity over time), and the cost of feedstuffs, especially high protein meals.

While Nicaragua has the potential to increase production of sorghum as a source of high carbohydrate feeds, cottonseed production likely will be low and stagnant during the 1990s so that increasing availability of protein supplements will be extremely difficult.

Current GON policies provide significant incentives to import poultry through the overvalued exchange rate, and moderate protections will be required to prevent poultry imports while that incentive continues. (However, the exchange rate stimulates domestic production when poultry is protected more than production inputs.) Given the importance of a growing poultry industry as a food source in Nicaragua, GON likely will find it necessary to maintain moderate levels of protection for broilers and poultry parts until alternate sources of domestic high protein feeds are developed. However, the longer term policy should be small levels of protection, equally applied to all products including those ready for consumption.

IV. THE PRESENT STATE OF FARMER-LAND RELATIONS IN NICARAGUA

A. INTRODUCTION

The objective of the following report is to provide sufficient understanding of the land tenure situation in Nicaragua to ensure it is adequately considered in the formulation of an agribusiness strategy. At present, this is probably the most divisive issue affecting agriculture, and one with important implications for long-term stability, investment, and economic revitalization.

The following analysis focuses on the effects on agricultural production and productivity of tenure relations, social relations, and other aspects of farmer-land relations in Nicaragua at present. However, in order to capture the complexity and importance of the issues involved, it is impossible to present a simple snapshot of the current situation. Rather, it is necessary to attempt an understanding of the historical and theoretical context from which it emerges. Given that the review of land tenure issues was just a small part of a much broader scope of work, this report must be seen as a first step in diagnosing such a difficult and ideologically charged question. This is also an issue in continuous flux with almost weekly developments. The field work for this report was completed in August of 1991, and thus does not fully incorporate more recent developments.

At the time of this writing (August, 1991) yet another pivotal point has been reached in the political process surrounding the farmer-land equation in Nicaragua. A compromise proposal has emerged from the Concertacion, or reconciliation process organized by the Administration. This proposal, culminated in Decree 35-91, has provoked further discussion and a counterproposal from the National Assembly, and apparently a final compromise.

Although there is obviously strong disagreement on important issues, both versions agreed on the validity of land distribution and titling for the smallest holdings. The important point is that discussion now focuses on the larger properties which are being contested by the "elite" on either side of the ideological divide, much of which is urban. This provides the basis for a compromise which accepts some degree of redistribution of land to the poorer elements of society. However, it is evident that considerable time and patience will be required to "settle" the issues related to land and to adjust to the structural changes which began during the 1980s.

B. HISTORICAL ANTECEDENTS

"The kind of people who make revolutions are not, as a rule, the kind of people who can organize for increased production; nor can landless labourers be transformed into efficient owner-farmers overnight."

Russell King, 1977

Following the observations of E. H. Tuma and others, the most successful agrarian reforms are the result of, not the cause of, dynamic social and political movements for modernization and development. The fundamental change in a successful agrarian reform is not one of asset redistribution, but of power redistribution affecting the full range of social, economic and political relations and is often accompanied by rebellion and violence. This rather lengthy opening section on historical antecedents is intended to capture the most relevant aspects of the movement for modernization and development in Nicaragua. The uneven progress in the redistribution of power there helps explain some of the curious features of the agrarian reform still unfolding.

1960 - 1979, the Late Somoza Period

While the 1960's and 1970's in Nicaragua under the regime of Anastasio Somoza Debayle are surely marginal to any real land reform effort, at least in terms of land redistribution, this period solidified many aspects of the structure of land use and much of the thinking about land as a natural resource and as a factor of production. Vertical cleavages within Nicaraguan society, previously based principally on familial ties, became associated with corporative structures, particularly in agriculture. The vertical integration of agricultural production, processing, marketing and exportation in association with bank holding companies and input importers and suppliers was institutionalized. Through a variety of mechanisms, including manipulation of exchange rates, interest rates, government subsidies and licensing arrangements, a highly capital-intensive, export-oriented agriculture was established, primarily on the Pacific coastal plain, and in isolated pockets of high quality land in the central mountains of the Interior. The agricultural export model of economic development was firmly established in Nicaragua during this period, and was emulated in other Central American countries. By 1979, the Somoza groups (family and holding company associates) owned 20 percent or more of Nicaragua's agricultural land.

The Somoza government's emphasis on the development of the Pacific coastal plain focused public resources there, to the comparative detriment of the remainder of the country, and strengthened regional disparities. These were amplified by the displacement of large numbers of resident agricultural workers and smallholders on the Pacific coast to accommodate expansion of capital-intensive production of cotton, sugar and some other export crops. Those rural producers with a commitment to being land owners were offered the option of opening the agricultural frontier to the east through resettlement or colonization schemes or spontaneous settlement of unoccupied lands. This notion of the agricultural frontier as an escape valve for excess rural, and even some urban, population is now a standard part of national thinking.

Horizontal cleavages in the Pacific coastal agriculture were developed during the Somoza regime, as well. The shift from resident labor, never as important in Nicaragua as in most of Latin America, to urban-based day labor solidified class

relations and the emergence of what the Nicaraguans refer to as the "obrero-campesino." This class of salaried or day-wage workers, usually living in villages or even cities such as Leon, are very proletarianized. They owned no land and did not have access to land for subsistence production. At the same time, the work habits and attitudes, as well as the skills and experience as resource managers, which are common among resident labor with access to subsistence land and among share croppers, atrophied among this class of workers.

Table IV-1

Increases in Percentage of Area Harvested and Yield, 1960-61 to 1978-1979*

<u>Export Crops</u>			<u>Domestic Consumption</u>		
<u>Crop</u>	<u>Area</u>	<u>Yield</u>	<u>Crop</u>	<u>Area</u>	<u>Yield</u>
Cotton	207	7	Rice	33	109
Coffee	32	71	Beans	66	19
Sugar(1976)	118	25	Corn	76	20
Tobacco(1975)	356	46	Sorghum	3	57

* Figures are for period ending 1978 - 1979 crop year unless otherwise noted. Source: Nicaragua: a country study. James D. Rudolph (Ed.), U.S. Gov't. Printing Office, Washington, D.C., 1982

While the Somoza period frequently has been touted as making Nicaraguan agriculture highly productive, the record appears decidedly mixed, at least during the 1960-1979 period. Increased output of cotton and sugar resulted primarily from expansion of area planted, exclusively in the Pacific on very high quality soil. On the other hand, those crops with the greatest increases in yield from application of new varieties and practices, rice, coffee and sorghum, also showed very modest expansion in area planted. The most important food crops aside from rice, i.e. corn and beans, showed minimal increase in yield and a moderate expansion of area, mostly onto less productive soils off the Pacific plain. With the exceptions of rice and tobacco, yields remained low by Latin American standards, particularly for coffee. The production of cattle, for both milk and beef, showed comparable increases in area and somewhat higher than average increases in yield, primarily through semi-confinement feeding of grains, especially sorghum. By the end of the Somoza period, fully three-fourths of the land in agriculture in Nicaragua was devoted to cattle production. The vast majority of cattle and coffee production was carried out by small and medium producers, i.e. those with less than 150 hectares. Virtually all cattle, coffee and basic grain production had been moved to the Interior. (See Table IV-2 for summary of regions used here.)

1979 - 1990, the Sandinista Period

Certainly much has been said and written about the agrarian reform, or more accurately land redistribution, of the Sandinista regime, generally by strong advocates or vehement detractors, with relatively impartial analyses being more rare. One of the most frustrating aspects of studying this period and the rapid changes which took place in rural man-land relations is the massive volume of unreliable data. Given the number of analyses made of this reform, the often prolonged and anguished debates about theory, strategy, and practice in the development of post-1979 Nicaragua, and the use of man-land relations data in the assessment of the performance of the country's pluralist agricultural production system, it is surprising how seldom the accuracy of the data is evaluated in the field.

The lack of confidence in the data from this period has two sets of explanations, generally paralleling one's support of or opposition to the social, economic and political outcomes sought under the reform. Opponents criticize much of the land redistribution data as simple propaganda, inflated to gain support from anti-Somoza liberals abroad and the poor majority in Nicaragua. The more damning charge is that the published figures were simply to obfuscate the lack of real change in the structure of man-land relations and the simple shift of property from the Somoza group to the Sandinistas in the guise of the state.

Supporters of the reform point to the obvious difficulty in gathering accurate data in a post revolutionary country. Large numbers of poor people were displaced. Many wealthy left the country and tried to hide their assets in any way possible. Invasions of properties were common, both spontaneous and orchestrated. With the emergence of the U.S. supported counterrevolution, much of the rural interior of the country was subject to guerilla warfare, again displacing people. The Public Registry in Nicaragua, through which all land titles are processed and maintained, is a paper-based operation at all levels, and is subject to abuse and rapid overload. Collecting data on tenure and holding size patterns involves tedious accounting work, complicated even under normal conditions by lags in reporting of transfers from municipal offices. And of course, there are more important things to do when reconstructing a ravaged nation than to collect data. But often, knowing what these priorities are, at least for the long term, can be better determined if accurate, well-understood data inform decisions.

All the above arguments appear to have at least some element of truth and affect the interpretation of data upon which this section is based. To the extent possible, insights of other analysts and impressions gained from site visits in Nicaragua will be used to temper the charges and countercharges regarding the data, but more importantly to inform the interpretation presented here. In concert with this being yet another interpretation, the presentation of data here is in different forms from those most often used, particularly the tabular forms from the Ministry of Agricultural Development and Agrarian Reform (MIDINRA), now divided into the

Ministry of Agriculture and Ranching (MAG) and the Agrarian Reform Institute (INRA). Unless otherwise noted, these are elaborated by the author. Given the above qualifications, it must be emphasized again that data presentations merely have heuristic intent here as part of a preliminary, rather than a definitive, assessment.

Two regionalization schemes are used to present data, which are summarized in Table IV-2. The first, employed by Eduardo Baumeister in most of his analysis (1991?), uses what will be referred to as "macro-regions," the Pacific and the Interior. This breakout represents the distinction between the fertile, volcanic soil plain and lake region of western Nicaragua and the rest of the country, often referred to as the agricultural frontier. The second scheme is that delineated by the Sandinista government for military districts. Its use for land reform data reporting and so forth parallels their attempt to decentralize administration of the country

The Pacific is dominated by first and second class soils apt for intensive production of annual crops, broken by steep and occasionally active volcanos, with slopes suitable for perennial crops and tree crops, including coffee in higher elevations. The principal limitations to agricultural production on this plain relate to water, either too little rainfall requiring irrigation or a water table too close to the surface requiring drainage, and some micro nutrient deficiencies or excesses. Over 60 percent of the population of Nicaragua lives in the Pacific with a surface area of only 15.5 percent of the country.

The Interior or the agricultural frontier represents for many Nicaraguans an undifferentiated mass of poor, broken land which produces similarly marginalized people. The broad, relatively flat Atlantic coastal plain forms the bulk of the Sandinista regions of the Atlantic and Rio de San Juan, though both have hilly regions in the extreme West. Both are pocked with small, isolated areas of very high quality, alluvial soils suitable for intensive annual agriculture, with San Juan having the bulk of these. Similarly small and isolated upland areas apt for perennial crops, primarily tree crops, are found in the West, but the vast majority of this area is of little value agriculturally. The remainder of the Interior, Sandinista regions I, V and VI, are very broken terrain with numerous micro-climates and small areas of class I and II soils, mostly in valleys. The bulk of the soils are suitable for extensive agriculture, where not steeply sloped, and perennial crops or forest reserve on steeper slopes. On eastern slopes and to the North, potentially highly productive soils exist for cacao and coffee above that. Rainfall is scarce on the western slopes and in the South.

Sandinista Land Reform

The standard interpretation on the Sandinista land reform is one involving three phases, with their distinct legal bases, social and economic objectives, and targets for

Table IV-2

REGIONALIZATION SCHEMES
(as a Percentage of Total Land in Nicaragua)

<u>MACRO REGIONS</u>	<u>SANDINISTA REGIONS</u>	<u>DEPARTMENTS</u>
Pacific (15.5%)	II (8.4)	Leon (4.4) Chinandega (3.9)
	III (3.1)	Managua (3.1)
	IV (4.0)	Carazo (0.9) Granada (0.8) Masaya (0.5) Rivas (1.8)
Interior (84.5)	I (6.2)	Esteli (1.9) Madriz (1.5) Nueva Segovia (2.8)
	V (8.4)	Boaco (4.2) Chontales (4.2)
	VI (13.8)	Jinotega (8.1) Matagalpa (5.7)
	Atlantic (49.9)	Zelaya (49.9)
	San Juan (6.3)	Rio de San Juan (6.3)

redistribution. (Land reform will be used here, as the Sandinista efforts fell short of a true agrarian reform, especially in developing the capacities of the individual farmers as resource managers, discussed below.) The present analysis will add a fourth phase, the interregnum of March and April 1990, or La Pinata as it has come to be called popularly in Nicaragua. This last phase is still clouded in obfuscation and polemic and cannot be assessed in the same manner as the other phases. Table IV-2 presents a breakout of the generally recognized phases of the Sandinista land reform for the two macro-regions from data presented by Baumeister.

The initial phase covered the period from the overthrow of the Somoza regime in July 1979 until mid-1982 and was backed by a series of decrees directed at the lands of the Somoza group, the Bank of America and the Nicaraguan Bank holding companies, as well as at nationalizing the banking system. Although there were some limited turnovers of land to workers unions in place on the land at the time of the final overthrow, the 20 percent (or more) of the nation's agricultural land which was confiscated from the Somocista groups was kept intact as operating units in Areas of People's Property (APP). Operated as state farms with paid managers, some with training and experience and some without, these generally capital-intensive farms underwent a number of transformations during the Sandinista regime. Most remained vertically integrated with what became state processing and marketing enterprises, shifting from local and regional administration to a more centralized, national structure, but with actual production decisions made at the farms. By 1989, more than 40 percent of the land in the APP had been sloughed off to cooperatives of APP workers, or more rarely, to individuals. Although an exact inventory of these lands describing their condition at the time of their takeover is not available, it is generally accepted that they comprised a majority of the highest quality land in the country, but that much of the infrastructure had been severely damaged and much of the non-fixed capital moved elsewhere.

The second phase of the land reform, beginning in July 1981 with the passage of Decree 782 and the application of Decree 760 and others, focused on lands which were either abandoned or with gross underutilization, with a floor of approximately 350 hectares in the Pacific and 700 hectares in the Interior. The intent here was to transfer land from those of the traditional, landed upper class who had not modernized to the rural poor. The vast majority of these transfers of land were to Sandinista Cooperatives (CAS), production cooperatives with collective or communal titles. Smaller amounts of land were also transferred to peasant producers with insufficient holdings for subsistence or subsistence plus minimal commercialization. In order to receive titles to land as individuals, these small producers were required to form Credit and Services Cooperatives (CySS, also abbreviated CCyS and CCySS) as conduits for credit and services from the government and for surplus production to government marketing organizations.

Table IV-3

NICARAGUA LAND REFORM BY PHASE AND MACRO-REGION*

Phase (Law)	<u>% of Total Area</u>	<u>% of Phase Area</u>		<u>Average Confiscation/ Expropriation</u>
		<u>Pacific</u>	<u>Interior</u>	
I (Somocista)	57	52	48	1083 mzs.**
II (782, 760, etc.)	27	50	50	674
III (14)	16	24	76	595
<u>Total</u>	100	47	53	894.5
<u>% of Beneficiaries</u>		28	76	
<u>Ratio: Land/Beneficiary</u>		2.28	1	

* Elaboration by the author from data presented by Eduardo Baumeister (1991? or forthcoming.)

** 1 manzana = .7 hectares = 1.73 acres

Note 1: Of the land titled (distributed?) under La Pinata, the regional splits were 49.7 percent in the Pacific and 50.3 percent in the Interior. The 826,703 manzanas titled during this period represent 22.1 percent of the total land of the land reform! From data presented by Economic and Social Research Center (CIES) of the Nicaraguan National Autonomous University (UNAN) under contract to Sparks Commodities, Inc. (1991). Source: INRA, 1991.

Note 2: Among the resettlement of the National Resistance (Contras) under the UNO government, only 4.3 percent of the 270,675 manzanas distributed (and not titled, to date), was in the Pacific. Distribution was relatively equal on a per beneficiary basis by macro-region, 37.9 manzanas in the Pacific and 36.3 in the Interior, but with wide variation among beneficiaries using the other regional scheme (Table 8, below). From data presented by Itztani under contract to Sparks Commodities, Inc. (1991). Source: National Center for Planning and Administration of Growth Poles (CENPAP), 1991.

The final phase under Law 14, passed in early 1985, eliminated the lower limits of 350 hectares in the Pacific and 700 hectares in the Interior. Although the average size holding expropriated or confiscated was only reduced by 12 percent, the significant shift to the Interior from the Pacific probably means that there was a more than 12 percent reduction in comparative productive capacity because of the generally lower quality soils in the Interior. This phase showed a much greater emphasis on transfers of land to individuals and smallholders in CySS groups, but transfers to CAS also continued. This third phase is the closest to what is often called a "land to the tiller" land reform, a transfer of real property to individuals already in place on the land, either as tenants or sharecroppers. In this case, much of the land was probably transferred to sub-subsistence farmers. It is important to note, as Baumcister points out, that there were very few sharecroppers and tenants in Nicaragua at the time of the Revolution and that perhaps 80 percent of titles to individuals under the land reform were to squatters. While such titling may not be an actual transfer of land, in the sense of expropriating it from one owner and giving it to another, establishing exclusive rights to land for the individuals receiving title is critical to their future security. This titling function is often overlooked or downplayed in land reform efforts.

The shift to more individual and CySS titling in 1985 was characteristic of a broader policy shift in the agricultural sector. Under the previous six years' policies, rural people generally and small producers outside the CAS and APP had experienced worsening terms of trade. Many had withdrawn from production, or at least had sought marketing opportunities alternative to those controlled by the central government, thus frustrating planned boosts in basic grains production. Under the new policies of "flexibilizacion," markets were opened somewhat, both in terms of prices and legalization of black markets. Some observers have attributed this change to the increased pressure from counterrevolutionary forces and their success at recruiting disaffected peasants from the central mountains. The overwhelming vote for an anti-Sandinista coalition among much of the rural population outside the Pacific indicates that if the intent was to "buy off" this group with land, it was not successful.

Whether or not this change of direction, or "viraje" as it has been termed, would have continued is open to debate. What does stand above debate is that the Sandinista land reform showed a favored region for reform and a favored mode of organization for reform beneficiaries, the former the result of historical circumstances and the latter the result of an ideological predisposition. That 47 percent of the land reform took place in an area containing only 15.5 percent of the nation's surface area, where 60 percent of the population lives, demonstrates the significance of this area to Nicaragua. The relative ease with which a dry coastal plain can be developed, compared to a more humid, mountainous region, makes the high quality soils there all that much more accessible. The combination of ready access, relatively high population density, and highly productive soils make the Pacific the heartland of the

country, the area of most dense economic, political and social activity, and therefore critical to controlling the country militarily.

The massive capital investment in agriculture of the Sandinista regime, which exceeded 20 percent of the gross agricultural product from 1984 to 1987, was largely focused in the Pacific. Even though the magnitude of this investment is probably exaggerated by the low levels of agricultural production reaching government controlled markets during this time, this public expenditure more than doubled the combined public and private rate of investment in agriculture during the 1970's, which was also centered on the Pacific coastal plain.

Not only was the Pacific the favored zone of investment, it was also the home of a favored population, with beneficiaries of the reform receiving on average more than double the land area when compared to the Interior. Considering the higher average soil quality of this plain, the productive potential of the land transferred was probably triple that of beneficiaries in the Interior. This inequitable distribution is exacerbated by the likelihood that land transferred in the Interior, particularly in Regions V and VI, may be duplicative. Taking simple MIDINRA/INRA estimates of the area in farms by region and comparing it with the total surface area of the regions yields the information in the Table IV-4 below.

Table IV-4

AREA IN FARMS AS PERCENTAGE OF TOTAL SURFACE AREA BY REGION

<u>Region</u>	<u>Area in Farms (Mzs.)</u>	<u>Surface Area (Mzs.)</u>	<u>Farm Area/ Total Area</u>
I	760,924	1,043,614	72.9
II	823,968	1,415,128	58.2
III	301,916	519,805	58.1
IV	383,092	670,384	57.1
V	1,349,482	1,419,847	95.0
VI	2,344,285	2,340,910	100.1
Atlantic	1,541,475	8,450,442	18.2
San Juan	567,857	1,065,064	53.3

The remarkable consistency and the magnitude of the figures for the Pacific, Regions II, III, and IV, contrast sharply with those of Regions I, V, and VI. Several sets of arguments can be made about the extent of urban areas in the Pacific and countered by the extent of unclaimed wasteland in the mountainous areas. A much more plausible explanation is that what is regarded as more valuable will be more closely guarded, measured, and accounted for than that which is not. The cavalier attitude toward the land and the people of the Interior, its "out there" status as the escape valve for marginal population, has led to the perpetuation of a pattern of institutionalized indifference by all the central governments of Nicaragua since WW II toward cadaster, titling, and registry of land in most of these areas, with predictable results.

The following tables demonstrate the base upon which the Sandinista government hoped to "recast" Nicaraguan agricultural development, production units heavily influenced by the state, either in the form of state farms or tightly controlled production cooperatives. Table IV-5 presents data from the National Union of Farmers and Ranchers (UNAG) from 1988 showing man-land ratios for the two principal types of cooperative established under the Sandinista land reform, *Agrícolas Sandinistas* (CAS) and *Credito y Servicios* (CySS). The former were organized as production cooperatives with collective titles of usufruct which were not alienable. CySS were generally formed from groups of individual farmers, many with sub-subsistence holdings, in order to take advantage of some economies of scale in the provision of services and credit. It is important to note that neither group of cooperatives actually managed services and credit for themselves, and therefore both types are seriously stunted developmentally as cooperatives. The figures represent total land claimed by these groups, not merely that transferred by the land reform, and show that the CAS members were given much greater access to land than CySS members, particularly on the Pacific plain. In addition to access to land, many observers have emphasized the much greater access to inputs and investment capital which the CAS had compared to the CySS, (e.g. de Groot and Plantinga, 1990).

While this mode may be an effective mechanism for developing a constituency loyal to a government, generally production cooperatives and collectives have a relatively poor track record as coherent and consistent producers of agricultural commodities and adequate income streams for their members (Berry and Cline, 1979). This is especially so in the absence of a strong religious or ideological commitment shared by the members, often enhanced by a physical or psychological threat from the larger society or from outside. Thus, although the CAS, especially in the form of the armed settlements in border areas, make sense in the early stages of a post-revolutionary society or one at war, once the pressure is off these production cooperatives are likely to break up into individual production units. This pattern was relatively well established according to a survey of 72 CAS in Region IV in 1989 by students and faculty of the Department of Agricultural Economics of UNAN. It should be noted that the diminution of government largesse to these cooperatives lowered the incentives for collective action.

Table IV-5

AREA PER PRODUCER BY COOPERATIVE TYPE BY REGION, 1988

<u>Region</u>	<u>Agrícolas Sandinistas (CAS)</u>	<u>Credito y Servicios (CySS)</u>
	<u>25,044 Members Total</u>	<u>54,125 Members Total</u>
I	20.2 - 22.2* (18.7) [34.3]**	13.8 (2.1) [3.8]
II	26.5 - 28.5 (19.4) [32.8]	14.3 (3.4) [5.7]
III	24.2 - 31.2 (17.6) [23.9]	13.6 (2.0) [2.7]
IV	14.0 - 20.5 (24.2) [38.1]	5.2 (8.0) [12.6]
V	38.2 - 45.5 (8.6) [14.7]	37.2 (1.4) [2.4]
VI	17.9 - 26.7 (8.0) [22.7]	22.9 (1.0) [2.8]
Atlantic	1.0 - 32.0 (6.2) [27.8]	17.5 (0.1) [0.4]
San Juan	60.4 (13.1) [17.9]	14.9 (2.0) [2.7]
<u>National</u>	23.6 - 24.2 (11.4) [24.6]	17.0 (1.7) [3.7]

* In manzanas. Where a range is indicated, this covers the discrepancy between titled and occupied land. For the CAS field reports and analyses of cooperative operations often show unused land beyond annual fallow. CySS generally do not show this, therefore the occupied figure is used.

** () indicates percent of land in farms for the Region
[] indicates percent of land in farms in the Reformed Sector for the Region

Table IV-6 presents a comparison by region of what might be termed two potential models for land reform, a state sector composed of the APP and CAS and a private sector composed of the "middle peasantry" and "tillers." One can again see the preponderance of the state sector in the Pacific coastal plain among farms generally, and within the area subject to land reform in particular. Unfortunately, no man/land ratios can be computed for these comparisons, as the numbers of farms or landowners are not available. Nor can comparisons be made for production per unit of area in this report. In this case, the primacy of the state sector in the Pacific reflects not only the importance and value, and therefore the desire to control if possible, the productive assets of this region. It also reflects the social relations of production and the capital-intensive predisposition of both the large, modern capitalist farm and the large, modern socialist farm. The former hopes to substitute capital for labor to help reduce labor problems, including high wages. The latter hopes to free labor for industrial expansion while enhancing the productivity of labor. In a case such as the Nicaraguan Pacific coastal plain, with an "obrero-campesino" work force, understanding of the parallel urban wage labor market is important. (And, it must be stated, beyond the limits of this brief study.)

Both models were regarded as credible by the Sandinista government and their relative values were recognized. While the social consciousness of the "middle peasantry" was regarded as backward, and that of large commercial holdings as positively counterrevolutionary, these were not radically attacked as in the cases of Bolivia and Mexico, at least as long as they showed adequate agricultural production and were not openly hostile to the regime. The importance of the "middle peasantry" to agricultural production and modernization through individual capital accumulation was lamented by Jaime Wheelock and other MIDINRA officials, and its performance was often contrasted with the rather torpid showing of the strongly supported state sector. Interestingly, after workers in the CAS and APP began to receive individual plots to produce subsistence crops, harvest season labor shortages developed as workers were engaged in sub-marginal self-employment on these plots, thus concealing anew the (at least seasonal) excess labor time on which the state model depended. This excess labor time is very much in evidence on the still operating CAS's visited near Telica and the state dairy farms which are part of the La Paz Centro project. All of these were very capital-intensive operations, exacerbating tendencies toward free riding in cooperatives and featherbedding on state farms.

The final phase of the land reform under the Sandinista government came during the interregnum following the February 1990 election. (See Table IV-7 below.) It is still not entirely clear exactly how the quantities of land which were titled during these two months prior to April 1990 were reported by MIDINRA earlier in its presentations of data, i.e. within the reformed sector or private sector and if under the reformed sector, under the categories where they were finally titled or some other.

Table IV-6

STATE SECTOR VS. SMALL AND MEDIUM SECTOR*

<u>Area</u>	<u>% of Total Land in Farms</u>		<u>% of Land Reform</u>	
	<u>State</u>	<u>Private</u>	<u>State</u>	
<u>Region</u>				
<u>Private</u>				
I	27.2	52.3	49.9	44.4
II	42.1	34.9	71.1	17.2
III	46.7	32.0	63.5	22.3
IV	45.8	37.7	72.1	20.9
V	23.2	41.3	39.5	51.7
VI	16.2	67.0	45.9	46.4
Atlantic with Indigenous Communities	7.7	23.1 34.1	34.5	10.3 60.1
San Juan	33.3	57.7	45.5	54.3
National	23.1	46.7	49.8	38.2

* State means land distributed to Cooperativas Agricola Sandinistas + State Enterprises

Small and Medium Private includes land in private holdings of 200 manzanas or less + land distributed to individuals and to Cooperativas de Credito y Servicios

Note: If, as Baumeister (1991) suggests, 80 percent of the land titled to individuals was simply recognition of the rights of squatters and not redistribution, the figures for % of Land Reform would need to be adjusted, i.e. much higher for the state sector and lower for the small and medium holder private sector. Because no figures are available by region on squatter titling, this adjustment has not been made here.

Of the more than 825,000 manzanas titled during the interregnum, fully 40 percent was titled to individuals and classified as private, making it doubtful that this was included under reformed sector for individual titles in earlier accountings. Title to production cooperatives and collectives were nearly ten times those to individually held cooperative groups, with nearly a quarter of these in Region I. (It was suggested that this recognized the large numbers of armed settlements in that region which could not be titled under war conditions.)

Aside from these, the majority of the production cooperative and collective land was titled in the Pacific. Both these patterns follow the patterns established under previously reported land reform activities. It is worth mentioning that La Pinata titles represent 22 percent of the land area of the land reform. The effects of this volume of work on institutions tasked to provide titles and to certify them must have been left them buried in a blizzard of paper and with very few incentives to complete the work efficiently.

The individual titles issued during the interregnum are of most interest, because of the remarkably inequitable distribution. About 54 percent of the private titles went to 7,439 people and averaged 24 manzanas each, with the remainder going to 303 people averaging 500 manzanas each, assuming one holding per person and per title. Forty percent of the land in large holdings and 31 percent of the large holding titles were in Region II, averaging 650 manzanas per title. Whether or not the issuance of titles to such large tracts to individuals is legal under the land reform laws and decrees is probably immaterial, either under those statutes on the books from the Somoza regime or those passed since the revolution. That these actions run counter to the spirit of the land reform, which was carried out on behalf of the rural poor, tends to de-legitimize further the Sandinista government, and in the process, much of the redistribution of land which did benefit the rural poor smallholders and landless. This is particularly true of the actions taken after 1985 with "viraje" policies. These policies made some attempts to make the reform more responsive to peasant desires and to make commodity markets more closely reflect supply and demand, reducing the skewed nature of the rural-urban terms of trade.

Thus, the reforms most proximate in time are those most discredited by their association with La Pinata and the period of confiscations and expropriations believed to be most abusive by many in the UNO government. Ironically, it is these same reforms, those directed at eliminating urban bias in terms of trade and offering alienable titles to individuals, which are the most likely to show real benefits to smallholders through the product of their own labor.

1990 to the Present, the Early UNO Period

The focus of the UNO government's attention in land reform and land tenure issues falls into two areas, political debate about "hechos y derechos" and subsequent

Table IV-7

TITLES ISSUED DURING THE INTERREGNUM BY REGION BY TITLE TYPE

<u>Region</u>	<u>Cooperatives*</u>		<u>Private</u>	
	<u>C.A.S. + C.T. C. y S.S. + C.S.M.</u> <u>(# of Coops)</u>	<u>(# of Coops)</u>	<u>< 200 Mzs./Ind.</u> <u>(Ave. X Number)</u>	<u>> 200 Mzs./Ind.</u> <u>(Ave. X Number)</u>
I	104,875 (412)	5,823 (29)	24,604 (15.8 x 1554)	7,991 (333.0 x 24)
II	68,281 (323)	12,984 (59)	35,502 (29.0 x 1223)	61,182 (650.9 x 94)
III	59,113 (231)	9,573 (63)	11,654 (21.1 x 553)	13,092 (569.2 x 23)
IV	101,850 (286)	16,064 (146)	10,690 (18.9 x 567)	10,559 (479.9 x 22)
V	19,971 (43)	720 (1)	42,110 (55.3 x 761)	22,317 (343.3 x 65)
VI	6,964 (73)	318 (3)	31,077 (13.5 x 2301)	12,713 (353.1 x 36)
Atl. + San Juan	87,820 (58)	1,725 (2)	23,665 (49.3 x 480)	23,466 (601.7 x 39)
<u>Natl.</u> <u>Totals</u>	448,873 (1426)	47,206 (303)	179,303 (24.1 x 7,439)	151,322 (499.4 x 303)

* CAS = Sandinista Agricultural Cooperatives
 CT = Work Collectives
 CySS = Credit and Services Cooperatives
 CSM = "Dead Row" Cooperatives (an open furrow or "dead row"
 marks the boundaries between individually farmed plots)

Note: From data presented by CIES, UNAN under contract to Sparks Commodities, Inc. (1991).

Source:

INRA,

1991.

legislation growing out of the debate, ostensibly as part of a process of reconciliation, and redistribution, titling, and parcelization as part of post-war demobilization and privatization of state enterprises. While the latter is perhaps more easily treated, it is certainly no more easily understood than the former. It should be recognized, to be fair to the UNO government and place its actions in perspective, that the UNO government is a very broad coalition cobbled together to form a united anti-Sandinista bloc.

Many observers have pointed out that a platform was not needed for the UNO coalition, as absolutely no one felt that it would win the election. The head of the coalition, Violeta Barrios de Chamorro, is a unifying symbol of defiance to both the old order of Somoza and the new order of the FSLN National Directorate. Her relative lack of political and administrative experience, and the coalition's lack of coherent, well-articulated proposals, would not have mattered much had UNO been acting as a loyal opposition. But, as a result of their unanticipated victory, akin to a popular revolt against Sandinismo, the Chamorro government is still trying to accustom itself to the role of governing the nation, rather than opposing a dictatorial regime.

The resettlement of demobilized forces of both the Contras (National Resistance or R.N.) and the Sandinista People's Army (E.P.S.), and of those mostly rural people displaced by the fighting was, and remains, a major undertaking for the UNO government. Estimates of the total number of people to be resettled run from 175,000 to 400,000. To date the demobilization of the R.N. has received the most attention, primarily from foreign donors, particularly the U.S., channeled through the Organization of American States' International Commission of Support and Verification (CIAV-OEA) and the National Center for Planning and Administration of Growth Poles (CENPAP). To date, CENPAP has distributed 270,675 manzanas of land to 7,443 families, with 52 percent of this in Regions V and VI (See Table IV-8). None of this land has been titled and the degree of conflict likely to emerge from this process is difficult to gauge, although some relatively serious disputes have occurred in Jinotega. (It should be noted that while these settlements have taken place very smoothly on paper, a chance visit to one resettlement area near Matiguas showed only the beginnings of housing construction, with no beneficiaries around.) Although some of the R.N. beneficiaries have experience as farmers or farm laborers, most have very little, according to CIAV-OEA. Eighty-three percent are of landless rural families and 94 percent are from the Interior. The quality of the land varies greatly, but several resettlement areas in Regions VI and II have irrigation and are suitable for intensive horticulture.

Table IV-8

RESETTLEMENT OF R.N. BY REGION*

<u>Region</u>	<u>Land Area (mzs.)</u>	<u>Beneficiary Families</u>	<u>Land/Family</u>
I	4,048	99	40.9
II	3,073	62	49.6
III	5,565	121	46.0
IV	2,879	121	23.8
V	68,638	2,982	23.0
VI	75,136	2,813	26.7
Atlantic	77,140	593	130.0
San Juan	37,796	732	51.6
<u>Nation</u>	270,675	7,443	36.4

* From data presented by Itztani under contract to Sparks Commodities, Inc. (1991).
Source: CENPAP, 1991.

Aside from the work of CIAV-OEA and CENPAP, little appears to have been done to date regarding the displaced. INRA estimates that, including the displaced, there are approximately 65,000 families seeking land. Whether or not land can be found to satisfy this demand is not known. Nor does there appear to be any consideration thus far of how to deal with those cooperative members to be displaced from land they received through the land reform, but which was deemed to be part of an unjust confiscation. (Most of the claims reviewed thus far by the CNA have gone for former landowners and against land reform beneficiaries, according to a CIES-UNAN review.) Estimates of abandoned land run from 5 percent of the land in farms upward to 10 percent, which is not including unused land titled to CASs in excess of their capacity to farm, and no systematic cataloguing of these lands has been undertaken.

INRA has been operating without any official organizational sanction and only a minimal budget from the UNO government, virtually halting its work in the field. Without any legal mandating of its functions, any INRA actions to title land may not be recognized by the court system as legally binding. In the current climate of extreme uncertainty, action by INRA might serve only to raise expectations.

The privatization of the National Corporations of the Public Sector (CORNAP), formed by the UNO government from all the state enterprises and state farms nationalized/confiscated by the Sandinista government, has proceeded in the dissolution of the enterprises and transfer of land to five beneficiary groups: the R.N., the E.P.S., former owners with justified claims, former workers unionized under the Rural Workers Association (ATC), and the administrative and technical staffs of the enterprises. Of the 415,745 manzanas of land that CORNAP had under its control in April 1990, 337,725 manzanas or 81 percent has been turned over to these groups, with former owners receiving approximately 25.8 percent, demobilized R.N. 22.3 percent, demobilized E.P.S. 16.7 percent, and former workers and staff the remaining 35.2 percent.

The largest enterprise in terms of land area, HATONIC (cattle), has turned over approximately 310,000 manzanas according to its records, which exceeds some estimates of the total extent of HATONIC holdings by over 20 percent. The breakouts for the recipients are: R.N. 23 percent, or 70,000 manzanas in 32 farms; E.P.S. 19 percent or 60,000 manzanas in 27 farms; former owners 80,000 manzanas or 26 percent in 78 farms; and the workers and staff the remaining 100,000 manzanas in 56 farms. According to CORNAP, HATONIC represents about 50 percent of the total value of CORNAP's landholdings, as turned over in April 1990. CORNAP officials consider the terms of transfer to be generous, selling the land, cattle, and equipment in units of production at approximately 50 percent of their value, with low interest rates and a payback period of five years.

Although the transfers of ownership are supposedly complete, a visit to the HATONIC project at La Paz Centro demonstrated that this was far from the case. Manager German Flores pointed out that no terms for the sales to the workers and staff, to the former owners, or to the demobilized had been negotiated thus far. Because of this, no investments or improvements could be made by the staff or workers who had received seven of the production units (farms). The three units returned to the former owner were operating, but no improvements had been made and no title had been secured. The two farms transferred to E.P.S. officials were essentially abandoned.

The five-year mortgage was impossibly short, according to the manager, and the suggestion that the new enterprise sell some of its land to cover the mortgage was simply not acceptable to the partners. (The actual form of the new enterprise, comprising workers and staff, had yet to be determined despite three months of negotiation and assistance from an attorney.) Milk was being sold to pay salaries of the workers and staff. But other capital assets, such as breeding stock, fat cattle, and equipment, could not be sold because of the pending negotiations. An earlier visit had shown that most of the equipment on the farms returned to the former owner was in disrepair, with the exception of the irrigation system for forage, a tractor and forage cutter.

The actual terms of sale were not discussed with the people at La Paz Centro, but the conditions on the ground appear to reflect the logic made explicit in a draft of the HATONIC dissolution plan. CORNAP and HATONIC sought to privatize all those businesses, whether agricultural production, processing, or marketing, which were not competitive with the private sector. With the funds from the sales of these businesses and donations from international donors supporting the privatization plan, the remaining CORNAP operations would be re-capitalized and brought up to the same technical and efficiency levels as their private sector competitors. HATONIC planned to bring its Chiltepe operation up to speed in this manner. If these units are not currently profitable, and often seriously de-capitalized, the wisdom of maintaining them as production units is questionable. Given the short payback period and high capital requirements, only the most flush investors or those capable of alternative financing are likely to find that they have not taken on debt the entity's cash flow is insufficient to service. This casts doubt on the success of many of the currently identified recipients and increases the likelihood of low sale prices, and accompanying discontent, five years from now.

The political and legislative activity relative to land reform, and particularly security of land tenure under the UNO government, is involuted and characterized by a series of misfires directed at undoing the "hechos" of the Sandinista government, particularly those of the interregnum. Following their stunning election victory, several right-of-center politicians of the UNO coalition interpreted their mandate from the voters as one of rectifying all the wrongs done to their country and their people during the previous 11 years. Of particular interest was the number of "unjust confiscations" which had been carried out. The breadth and depth of the response to this rhetoric by the then Sandinista-controlled National Assembly appears to be largely a reaction to fears of a "rollback to 1979." The resulting legislation, Laws 84 through 88 were designed to head off this feared retrenchment. Laws 85 and 86 are the focus of the current crisis and are those which authorized the titling of properties under La Pinata. This covered large numbers of urban properties, even down to cars and air conditioners, in addition to those listed above, and it is these urban properties which have received the most attention in the Nicaraguan press.

The other Laws, 84, 87 and 88, are also important to the present situation and the UNO government precisely because they are generally not questioned, are specifically not part of the La Pinata debate. These laws have helped to consolidate and legitimize the land reform actions of the Sandinistas.

- Law 84 basically certifies as cooperatives all those which had not officially been registered and approved as cooperatives under the cooperative registry and in accordance with cooperative law.
- Law 87 moves jurisdiction for the agrarian reform laws and decrees of the Sandinista regime, and others previously on the books, out of the purview of the Agrarian Tribunals established by the Sandinista

government and into that of the judicial system. This law, among others, formed the basis for the recent unanimous Supreme Court decision declaring as unconstitutional the extra-judicial procedures for settling land claims, discussed below.

- Law 88 opens up in a very significant manner the property rights of those who received land through redistribution and/or titling under the Sandinista government. Those with cooperative or collective titles, and other titles with restrictions, are given the rights of alienation through sale, inheritance, and so forth as individuals, if they so choose. This at once liberates land reform beneficiaries from dependent relationships with the cooperative or collective and with the state, but exposes them to the vagaries of the markets for land, credit, and commodities, which have not customarily been pure and perfect in Nicaragua.

By the time the UNO government had assumed power on April 25, 1990, the level of polemic regarding property rights had escalated markedly, and one of the first actions of the new government was to establish a procedure to review claims against unjust confiscations. Decree 11-90, Revision of Confiscation, established a National Review Commission (CNR) under the office of the Solicitor General to review claims and to take certain actions, including entry into the Public Registry of decisions settled by the Commission and recommended to the Solicitor for reconciliation. The use of police force to remove those in violation of the decisions of the CNR was included in the law. This has in practice been largely unused against beneficiaries of Sandinista government policies. Both these provisions, Articles 7 and 11 of Decree 11-90, were declared unconstitutional by the Nicaraguan Supreme Court one year later, May 17, 1991.

Subsequent legislation, in the form of Decree 23-91, purports to correct the defects of Decree 11-90 and has yet to be tested in the courts or implemented. One provision of Decree 23-91 serves to legitimate the proceedings of the CNR in the cases thus far reviewed, despite the unconstitutionality of such proceedings. Another provision calls for an inventory of the cases presented to the CNR, which are to be presented to the President as soon as possible. Article 12 commits the Ministry of Finance to devise a system for paying claimants whose property rights were upheld, but for whom the return of property was not possible. The essence of this law is an attempt to certify as judicial and constitutional an administrative procedure, the workings of the CNR under the Solicitor General, which have been declared unconstitutional specifically because of their administrative character. The constitutionality of several articles of Decree 23-91 is likely to be tested soon.

The CNR reviewed approximately 2,000 of the 7,000 claims made by those who had property confiscated. In the process of review another potential problem has surfaced, also now lost in the debate, which may prove to be very significant in the

future. Both Decree 11-90 (and its repaired version, Decree 23-91) and the Transition Protocol signed by the Sandinistas and the UNO government provide for indemnification to those whose property was unjustly confiscated. Although the language of the Protocol sounds very much as if the process will be a judicial one, the procedure under Decree 11-90 was strictly administrative, with a right to judicial appeal. To date, very few of those who have been awarded the return of their property under the 2,000 cases reviewed have accepted any form of compensation, only the return of their land. As the number of cases increases, the likelihood of questions regarding compensation other than return of land will arise, as will the question of "real price" of land, so frequently referred to in the debate regarding La Pinata. Perceptions of what is or should be the "real price" of land vary greatly in Nicaragua, and the present, thin market is not adequate for establishment of a price, particularly as it is affected by the prolonged absence in many areas and over many years of a viable market. This determination of a "real price" for land is, it is hoped, part of the mandate of the Ministry of Finance under Article 12 of Decree 23-91.

At this writing, the National Assembly is back in session and outcome of the debate regarding the attack on Laws 85 and 86 is in doubt. In summary form, the following is known: Introduction of legislation into the National Assembly in June by UNO legislators to overturn Laws 85 and 86 provoked a walkout of the Sandinista members and considerable, probably orchestrated, protest in the streets and takeovers of government buildings by Sandinista supporters. The legislation was tabled. In mid-July, La Concertacion addressed the issue of La Pinata over a three-day period and drafted a compromise proposal now before the Assembly.

The most significant aspect is that relating to quantities of land which will be exempt from the rollback provisions of the new law: 35 manzanas in the Pacific and 70 manzanas in the rest of the country. This would effectively leave exempt the vast majority of smallholder land reform beneficiaries. A counter proposal by the Higher Council of Private Enterprise (COSEP), actually launched before the compromise emerged from La Concertacion, provides for a maximum of 10 manzanas in the Pacific and 20 manzanas in the rest of the country (El Nicaraguense, # 32, July 12 - 18, 1991). This limit approaches the subsistence level for a rural family in Central America, about 7 hectares of first class land, and is clearly too little for the development of commercial smallholder agriculture in Nicaragua.

C. ANALYSIS OF THE PRESENT STATE OF FARMER-LAND RELATIONS

The Approach Used to Assess the Immediate Problem

Several alternative approaches can be taken to the current situation in Nicaragua. One could take a purely technical point of view and speak only of the possible effects on agricultural production of farmer-land ratios, social organization for economic activity, land prices, and production technology among various groups of farmers, and then speculate about the effects on farmer strategies of some policy interventions. Some of this will be done here, but as mentioned above, much of the data needed to make such an analysis are of dubious quality. More importantly, the generally implicit assumptions about stability and security of the present farmer-land relations simply do not hold in the political climate. This approach also attempts to ignore the obvious, agrarian reform is essentially a political process, based in values about the desired nature of society and its economy, which inform and direct the state in its intervention. Successful agrarian reform, as part of a larger process of modernization and development, will alter power relations in favor of reform beneficiaries. Nicaragua is in the middle of such a process, not at its end, and the current property rights debate is a manifestation of the process.

A second approach might be to recognize the political nature of this process, but to remain aloof, noting that the current uncertainty relates to the vagaries of the establishment of a new democracy. Until everyone settles down into the rhythm of the game, the rules of which are still being made up even as it is being played, there is not much foreign donors can or should do. This assumes that these same donors, and the governments and institutions behind them, had no role in organizing the game. It further assumes everyone's firm commitment to playing the game, which makes agreeing on the rules and later adhering to them simply a matter of time. Clearly neither of these assumptions holds. For both those of the extreme right and the extreme left, democracy of the pluralistic version with checks and balances obstructs the effective power of a strong executive or "mano dura" so often referred to, making their commitment to the compromises of democratic government very tenuous. And, as has been demonstrated repeatedly in recent years, transitions to more market oriented economies and democratic processes take years, especially if undertaken simultaneously as in Nicaragua. Foreign governments and aid donors, as well as Nicaraguans, must recognize the complexity and long-term nature of the task at hand, a task in which those governments and donors are also engaged.

The approach taken here will be to cover briefly the major aspects of the political problems, addressing the assumptions first in the context of the present crisis. A very brief piece will highlight some of the conceptual barriers which seem to frustrate the debate, or at least channel it into limiting vocabularies. This will be followed by some tentative technical analysis, which will try to avoid hiding behind the "inadequate data" smoke screen, and will point to some areas for further investigation and likely problem areas where intervention will be called for. The intent is to stimulate

discussion, but in a perhaps different light. In this regard, the report by Robert Landmann and Robert Bond of CARANA Corporation, Nicaragua's Political Economy: The Role of the Private Sector, is taken as background information understood by readers of this report.

Land, Laws and Legitimacy

The importance of land in Nicaraguan society and to Nicaragua's economy must not be underestimated. In the present climate of economic duress, land figures as the fundamental asset: it is the very base of sustenance itself to those on the margin and the critical factor of production of in agricultural production for a country whose agribusiness exports off the most hope for paying its international debts.

Land is also a symbol of esteem and independence, and the taking of a man's land is the social equivalent of emasculation. The persistence of the territorial nature of land (in a political-tribal sense), demonstrated by the prevalence of terms like "nuestra gente" and "nuestra tierra," opens vertical and horizontal cleavages in society that grow geometrically, and diminish the likelihood of a long-term settlement.

It appears the longer land "cauldron," with its symbolic significance and highly public pondering about its possession, remains on the front burner of the political stove, the more likely it is to boil over. Stoking and fanning of both political extremes, as well as foreign donor's insistence that an agro-export economy is the most appropriate model for Nicaragua, heightens tension over the ownership of premium land - - particularly land suitable for production of high value fruits and vegetables under the most rigorous, technically-sophisticated regimes. Such land thus has not only the potential for favorable commercial, but considerable "rents." These "rents" are consequent on the largess of donors and government as this category of land is promoted to the status of an asset of national economic priority.

If certain qualities of land are emphasized in such a development scenario, so too is a certain class of people: the technically sophisticated, well- informed agri-business elite. Although it is possible for cooperatives to apply their excess labor in export-directed production, particularly in fruits and vegetables, the technical assistance they need to produce high quality crops is channelled elsewhere if donors select an incompatible institution as the delivery mechanism. Such a bias could increase the likelihood of politically motivated insecurity of tenure as the disadvantaged invade prime land held by the producers from the favored class.

Many participants in the debate in the National Assembly are striving to provide security of "nuestra tierra" for "nuestra gente." The solutions have been couched in terms of designing the proper legal framework, thinking that, as with the laws setting in motion La Pinata, the very act of passing the law or set of laws will guarantee the desired outcome. Rather than the codifying the norms and values of the society, law

takes on an "instrumental" character. Law becomes another "instrument" that the group in power uses to benefit itself at the expense of its rivals.

Laws structure the social order when they reflect a society's deeply held values that are the source of their legitimacy. Only then will they be generally obeyed and enforced. Nicaragua today faces a unique set of circumstances. One group has the power to draft laws in pursuit of its own ends and force them through the National Assembly. But, the means of enforcement, the police and indirectly the judiciary, are in the hands of its rivals. When the first group defines itself as the antithesis of the second, polarization is reinforced. **Such partisan laws will neither be regarded as legitimate nor enforced.**

Two agreements unite these groups, the Transitional Protocol and the document of social accord establishing La Concertacion. Both stress the importance of reconciliation and the need to set about the business of reconstructing the nation's economy in pursuit of a more just society. Neither of these agreements has any legal status, but appear to have great legitimacy in the eyes of the majority of the population which seems to crave the realization of these rhetorical flourishes, especially that of the agricultural frontier. Much of the work in recent months of the political parties, at least the extreme wings of both parties, has been geared to delegitimize the strongholds of the other, the right against the judiciary and judicial procedure and the left against the Assembly and legislative initiative.

Surprisingly, and despite COSEP's intransigence, La Concertacion has emerged as the sole forum in which compromise can be reached and because of this, its prestige and legitimacy have grown. There appears to be a clear opportunity for Violeta Barrios de Chamorro to enhance both her control of her coalition and of her country by embracing the compromises of La Concertacion, particularly this critical one on property rights. She should take advantage of this occasion to enhance her stature as an executive. Assuming the compromise from La Concertacion would be passed into law, it would certainly not guarantee smooth sailing ahead. Issues of compensation and eviction would become technical ones of economic calculations and enforcement, with more latitude and decidedly less polemic. But, they would then require quick, decisive action backed by money and continued public goodwill, meaning she would need good support from donors and probably the thus far irresponsible Nicaraguan media.

Without some form of basic agreement at least to begin work on land tenure issues, an agreement which is backed by a consensus and thus a degree of legitimacy which would make implementation plausible, it appears doubtful that Nicaragua can overcome the current atmosphere of extreme insecurity regarding land tenure. The depressing effects on agricultural production of tenure insecurity are widely recognized, particularly as they affect long-term investments in infrastructure, tree crops, land improvement and conservation measures, and in extreme cases, even the

willingness to produce beyond a subsistence level. Donors seriously interested in the development of Nicaraguan agriculture and Nicaragua generally should be prepared to assist the government quickly with technical assistance and money to support creative financial arrangements for compensating successful claimants. Other areas in which assistance are likely to be needed, and areas in which more detailed analysis should take place to support informed decisions, are described below.

Confining Concepts

Several other points which cloud the debate over land reform in Nicaragua should be addressed. In virtually all discussions of land reform in Nicaragua, as elsewhere in Latin America, land which has been intervened by the state and those who benefit from such intervention are referred to, almost in perpetuity, as part of the "reformed sector." People and land within this immutable "sector" are then treated differently from those in the "private sector" and are generally regarded as some form of ward of the state. In the worst manifestations, the "reformed sector" becomes an enclave with its own rules about property rights, its own "separate and unequal" systems of technical assistance and marketing, and its own internal logic growing out of an extreme dependence on the state. Generally these areas of land and the people occupying them are neither allowed to succeed nor to fail. They then become potentially either a political liability of the government, which is perceived as having either subsidized them too much or not enough, or an asset if public works and other pork barrel items are dispensed with care and fanfare.

The ability to let go of these people and land seems to escape the paternalism of the state, which can be much stronger than that of any patron. The dependent relationships developed often limit the beneficiaries' long-term prospects in society at large, particularly in the "private sector" in agriculture. It appears more productive to think of the reform process as a process and those involved in the acquisition of new land, and the skills, experience and capital to manage their land, as a flow. In this way, the goals of the process become more clear and the fixed temporal nature of the process better defined, along with realistic expectations, including the possibility of failure. Now would appear to be a good time to break with the "reformed sector" mentality in Nicaragua, beginning with the donors who intend to get involved. This of course does not mean aborting the present, ongoing process, which has generally lacked either the ability for farmers to acquire the needed skills and experience of management of their resources or the capital to enhance the productivity of their labor and land.

In relation to the above, farm families (especially when thinking of the campesino as a class) also tend to be perceived as in a perpetual state, i.e. the child of a farmer will be a farmer and someone who is now a farmer (or a member of the campesino class) is immutably stuck in that vocation. This thinking leads to a paternalistic fear on the part of those involved with government programs, especially with agrarian reform programs, of having their beneficiaries fail as farmers. This has prompted the fear in

Nicaragua of campesinos losing their land because of the problems they encounter as owner-managers, becoming destitute, and returning to an agrarian reform agency again demanding land. Discussed as a vicious circle, (the only indication of a flow concept, albeit a relatively non-dynamic flow) the assumption is always one of only marginal competence and subsequent destitution on the part of the beneficiary if he/she is allowed alienable property rights. Agrarian reform is generally a transfer of both wealth and a potential income stream from that wealth. If the reform only transfers wealth, i.e. does not assist in getting the beneficiary the skills, experience and capital necessary to have a fighting chance at realizing that income stream, or if the markets from which the income must derive are so construed that the beneficiary stands no chance of being competitive, the reform is not likely to succeed. The necessary changes in power relations beyond land ownership have not been made. In such a case, the likelihood is quite high of a vicious circle as envisioned by many in Nicaragua today.

Some of the proposals for analyses and potential forms of assistance to Nicaragua in agrarian reform efforts presuppose the need of a very strong institution building component. This may well be needed. However, strong institutions do not necessarily have to be highly centralized and rigidly controlled from the center. While accounting and auditing procedures can be centralized, for maintaining information on titles and land prices for example, it does not follow that for some action to be legally binding and legitimate that it need pass through some centralized bureaucracy. To the extent possible, cadaster, titling, taxation, and dispute resolution should be decentralized to the most local level technically feasible that can make sense economically. Technical sophistication and centralization is not a guarantee against corruption in land ownership issues, particularly when professionalized, bureaucratized, and removed from the public view. It is probably also unwise to create a centralized agrarian reform mega-institution to carry out a wide variety of functions, from cadaster, titling, and redistribution to resettlement, technical assistance in production, and conflict resolution. The tendency to create job security for functionaries through maintaining a clientele is high, especially when linked to a "reformed sector," filled with immutable campesinos, or worse, obrero-campesinos.

Finally, the concept of the "agricultural frontier" seems to still carry much weight in many quarters in Nicaragua. Where this "agricultural frontier" lies in Nicaragua is difficult to determine, either statistically or anecdotally. Some refer to the vast area of the Atlantic coastal plain and others to Regions V and VI and Rio de San Juan. The agricultural potential of the Atlantic region appears by all accounts to be quite limited, in terms of first and second class land, most of which appears to be accessible only by water or air. Regions V and VI are virtually totally claimed (See table 4.), if not farmed, and agricultural land, while not nearly so scarce as in the Atlantic, is certainly not more than 10 percent or 15 percent of the surface area of these regions, excluding land for extensive grazing and tree crops. This leaves Rio de San Juan, which appears to have more land apt for grazing and for tree and other permanent crops than the Atlantic, but less annual crop land than Region I. The real

possibilities for expansion are probably quite limited, and are even more limited when the low quality of infrastructure and services are considered. It should come as no surprise that much of the abandoned land is in what might be termed frontier areas. The tendency to use land as a substitute for investment in education and training of people and for other investments which enhance the productivity of land is doubly destructive. A typical pattern is for a family to clear forest or shrub land and eke out a rough life for five or so years, often under conditions of rather severe hardship. Without access to agricultural inputs, markets, and basic services, the land is often in poor state sooner than if it were farmed more intensively with inputs. Frequently after this period, the land is sold for rough grazing or is abandoned. Both the land resource and the human resource are often seriously degraded in a short period and the net social benefit is negative. There appears to be no reason to think that Nicaragua is an exception to this pattern (see Thayer Scudder, 1981). Given the capital shortage in Nicaragua, the temptation will be strong to substitute land for capital and it should be resisted even more strongly.

Likely Problem Areas and Tentative Suggestions

There are a number of issues specifically related to land markets and land price which will greatly affect the outcome of the present transitions to a more market oriented economy and to a more stable set of farmer-land relations. As stated above, land price relative to compensation for those successfully making their claims through the legal system is one directly affecting commitments of the current government. At present the claims and counterclaims frequently have astronomical figures attached to them and land prices generally appear to be greatly inflated relative to the potential income streams the land is likely to yield. The Ministry of Finance may well benefit from technical assistance to help establish ranges for fair market prices. Given the hyper-inflation of the recent past and the low level of activity during most of the 1980's, land markets are not likely to be functioning efficiently. The tendency to over pay, particularly in any negotiated settlements which are not at arm's length, will be quite strong in Nicaragua and a donor-assisted system of oversight can help legitimize this delicate process.

Establishing price ranges considered reasonable and publishing them widely can also help guide the market in the near term as a great deal of land is likely to come onto markets in some areas. As many of the CAS and other collective forms break up into individual holdings, many of these people will for one reason or another be selling their land. There is much discussion of land banks in Nicaragua to buy land or assume title to abandoned land to redistribute among the 65,000 farm families mentioned above who seek land. One such land bank has been established by the regional office of the National Agrarian Commission (CNA) in Region IV. This concept is well worth further investigation. However, it seems that land banks should act not just to accumulate and redistribute land, but also to stabilize land prices locally. When one considers the potential disparities in power in a land market between someone with savings in the U.S. and a Nicaraguan small farmer whose

wealth, aside from his land, has been wiped out by inflation and poor macro-economic policies, any new land markets may become extremely abusive. Those who choose to leave agriculture should have the benefit of receiving a fair price for their land to invest elsewhere. By establishing a price floor locally for land sales, with a land bank guaranteeing that price, i.e. actively intervening through purchases if necessary on sales of up to say 50 manzanas in the Pacific and 100 manzanas in the Interior, the government can add an element of security and stability to what is in essence an untested commodity market. Land banks could easily help smallholders to make land swaps and so forth to rationalize their holdings as production conditions change in response to technological change or social organization. Of special concern are CAS and CORNAP units which are single production units. When these are broken up, there are often great costs in reorganizing the unit for individual holders. Land banks might be useful in heading off such breakups and locating buyers for the units and alternative land for those currently on the single production unit. All the details of such a land bank need to be investigated, especially its relationship to other institutions working in land reform in Nicaragua, with an investigation of the Region IV land bank a likely starting point. Land banks would obviously have an interface with INRA, but should be decentralized and not state owned entities.

Taxation policies were not investigated with any depth, but probably should receive some attention. Currently most taxes are collected at the time of sale of property, adding to the sale price usually, and adding another disincentive to sales generally. Ideally some land taxation scheme would add incentives for good soil maintenance and high productivity and relatively severe disincentives for poor practices, under utilization, and low productivity. Most of the literature suggests that land taxes in Latin America are regressive and unenforced. Appropriate taxation policies may make land prices more coincident with economic value in production,

The National Bank for Development (BND) is apparently requiring land titles as collateral for annual production loans to small farmers. It is not known with how much rigor this is being enforced, but this practice has a potentially depressing effect on smallholder production. The validity of certain types of provisional titles may be called into question and, given the volume of paper flow through departmental and national public registries in the past 18 months, this may be a reasonable concern. However, this points up the absurdity of using land titles as collateral in the first place, especially under the current circumstances. It will not help the image of BND to begin to accumulate property. From the perspective of the right, this looks like another manifestation of the land hungry state. From the left, now out of power, this may seem like another bank holding company developing in conjunction with the state, as was the practice under the Somoza government.

A more reasonable method seems to be to use the crop as collateral, with the inclusion of crop insurance in drought prone areas as a standard practice. It is hoped that any solutions to the agricultural credit problem will consider this area thoroughly

and consider the present state of insecurity and its contribution to risk aversion on the part of smallholders. The tendency to instill some discipline into a credit market, i.e. to get borrowers to repay loans, is laudable and sorely needed in most of underdeveloped Latin America. That having been said, it appears counterproductive in every sense of the word to begin by dispossessing people, especially newly independent smallholders, who still have little experience managing either savings or credit. This is particularly problematic in a case such as Nicaragua, where the expectations of the outgoing government were quite the opposite of those now professed by the current regime. Under the Sandinista regime, credit was promoted by the government and was often used as current income rather than for investment, with few repercussions, particularly for the CAS. If the first half of the policy obtains, ample credit or even encouraged use of credit, the second half appears to follow, no repayment is necessary. (This could be readily exacerbated by a donor policy of pushing credit to boost production. While this is attractive to the donor in that it is easily designed and implemented and moves lots of money fast, it is often inappropriate in agriculture.) It may make more sense to allow the market to ration credit and concentrate on equitable access to it for a wide range of good risks. A serious misfire on short-term, crop production credit will have even worse effects on the more important lending, for long-term investment in irrigation, tree crops, and equipment. This is a learning process and we ought to be patient with campesinos, especially in the near future as relates to alienation of land because of debt.

Land price, and its relationship to labor price, also have implications for technology selection. It appears that Nicaragua has some truly skewed allocation of resources, given the prices of land, labor and capital in the current markets. These prices, their relationship to reality, and their effects on technology selection should be analyzed more thoroughly soon. As admittedly very rough examples, consider the following. In the spirit of, if not with the precision of, the work of Hayami and Ruttan (1971) and Binswanger (1977 in Arndt, Dalrymple and Ruttan), land price/labor price ratios should give us some indication of technology expansion paths, assuming real prices established by markets.

- On unirrigated sandy land on the Pacific, valued at \$1,500 to \$2,200 per hectare, using day wage labor valued at \$3 to \$4 per day, one might expect to find equipment of a scale similar to that in use in Northwestern Europe during the 1970's. Instead, we see enormous machinery, either Soviet equipment imported by the Sandinista regime or U.S. equipment imported privately within the past 20 years, indicating gross mis-capitalization.
- Irrigated clay land valued at \$4,250 to \$7,150 per hectare and the same labor rates might be expected to find in use some small-scale technology borrowed from East Asia in use rather than the same behemoths as observed on the sandy soils.

- The price of established stands of coffee in Matagalpa of about \$7,000 per hectare when compared to land nearby of similar quality but undeveloped at \$75 per hectare should demonstrate extraordinary returns to labor, the primary cost aside from seedlings of establishing such a plantation. In fact, the \$2 per day wage indicates outstanding returns to management or capital, if these prices are realistic.

The general argument among Nicaraguan largeholders is that labor is of such low quality and so difficult to manage that a higher wage is not warranted, and therefore, the need to displace labor. A similar case was made sporadically during the Sandinista period as part of the "obrero-campesino problem." **Whatever the case, the practice of neglecting the development of human resources in favor of capital-intensive, labor-displacing production systems seems to have been a constant in Nicaragua for some time. It is perhaps the greatest shortcoming of the Nicaraguan land reform under the Sandinistas that this proclivity was not reversed.**

CAS workers visited during field visits near Telica showed a tremendous tendency to defer production decisions to the technicians hired by the second tier cooperatives to advise CAS "managers." Even though it was the workers' CAS incurring debt to cover annual production costs, they expressed few reservations about planting cotton as their primary cash crop. It was the responsibility of the state to guarantee a higher price. (Aside from the lack of a financial return, these CAS workers were also fatalistic about the continued poisoning of themselves and their families during spraying sorties.) Whether this results from a lack of management capacity or a lack of initiative cannot readily be discerned. In either case it points to both a major problem and a major opportunity to increase labor productivity through farmer training. The relationships exhibited between CAS members and technicians were not significantly different from those between day laborers and benign straw bosses. Relying on the cooperatives to provide the training may not prove satisfactory, and an alternative of working directly with both the farmers and the second tier cooperatives at the same time seems most appropriate.

It should be noted that the smallholders of the Matiguas region attending the inauguration of a cacao producers' cooperative gave a radically different impression. They showed quiet confidence and initiative, but this was backed by little hard, technical information to improve the management of their stands. They had even less knowledge of the market and how to organize themselves for greater power in that market. These growers receive only about one-fourth to one-third the price of organized growers in Costa Rica with similar conditions.

Again, greater knowledge of the current on-farm population, their levels of technical and managerial skill, and actual experience with operating a farm should be gathered and assessed prior to interventions to enhance labor productivity, such as farmer training, help with social organization, especially cooperatives, and labor augmenting

technology. It bears repeating that, under conditions of rapid change and social upheaval, people are prepared to learn and do new things, particularly if they see some positive outcomes for themselves in it. Considering the changes in Nicaragua, programs aimed at boosting labor productivity, particularly management skills in agriculture, may have high, long-term payoffs. At the same time, considering the high levels of under- and unemployment in parts of the country, capital creation through the application of labor to old-fashioned public works, such as small-scale irrigation, public markets, farm-to-market roads and trails, reforestation and other conservation measures, appears to be called for to boost effective consumer demand.

The dearth of reliable data relative to farmer-land relations is particularly ironic, given the multitude of literature generated about the Nicaraguan land reform under the Sandinistas. No agricultural census has been carried out since the early 1970's, and it is precisely this sort of broad scope of general knowledge which seems to be most lacking. Of particular interest are cropping patterns, nature of the rural population, especially land reform beneficiaries, how these relate to holding size and soil quality, types of equipment and other on-farm capital, off-farm employment, and level and types of education. Several localized studies across structural patterns and cropping patterns have been done recently or are in progress, as well as several broader studies on a single type of tenure complementing the above studies, but they lack generalizability without national crosscutting data to relate to them. A census takes a great deal of time and money and is really relevant for long-term strategic analysis. As such it cannot help us immediately, but the lack of such "normal" data gathering sets back any statistical analysis and intelligent planning for as long as it is absent.

In the same vein, if at some point titling is to be streamlined and the public registry computerized to facilitate this, a cadastral survey will have to be undertaken to avoid computerizing and institutionalizing garbage into the system. There is a wide range of technologies available to complete this process and establish a more responsive system, but the needs of the users and the realistic capacities, both in terms of technical expertise and public finances, to operate and maintain such a system should take precedent over marginal advantages in precision. The actual state of the public registry was not examined, but, given the volume of activity in the past 18 months, it must be swamped. Most informants said it took from two and one-half to five years to receive a final title, but most felt this was not a hindrance to land sales at present. On the other hand, no informants had bought or sold land in over five years.

Land conflicts are likely to continue for some time in Nicaragua and they appear to be of three general types, which might correlate with certain regions or patterns of tenure and holding size. Conflicts precipitated by simple population pressure are as much the result of poverty and lack of alternative forms of livelihood in rural areas as they are of the value of the resource. Much of Region IV appears to fit the description of an area likely to have this form of conflict. A second type of conflict might be euphemistically called titling pressure, conflict based on duplicate titles,

titles without clearly delineated meets and bounds, or titles based on customary rights not recognized by officially issued titles. These are common in newly settled areas and those with spontaneous migration or poorly planned government programs. Regions I, V and VI are very likely to have many of these as people return to former homesteads or sell parcels not in use for some time. Simple bureaucratic mistakes are not to be ruled out either, given all the shuffling about and dividing up of the "patrimonio nacional."

Finally are cases of class conflict, between owners (current or former) and workers (with or without legally recognized rights). These are in many ways local manifestations of questions of legitimacy, as discussed above, and will not disappear without resolution of those issues of legitimacy or the imposition of force. These are likely to occur anywhere in the country where largeholders employ, or formerly employed, large numbers of organizable workers and where the question of the justice of the division of the fruits of the land is raised. The Pacific coastal plain and coffee plantation areas are the most likely areas for this type conflict. If, as appears to be a reasonable suggestion, the regional CNAs are given further support by the government and donors, assistance and training in handling these types of conflicts could be given to the staff working with dispute resolution.

With respect to this last point, a general institutions² analysis of the agricultural sector would greatly benefit any future donor efforts, particularly projectized efforts. Suffice it to say that many of them (local institutions) are in serious disarray, often due to their being associated with one political tendency or another. Those identified as Sandinista are now short of cash because of government intentions to dismantle or at least tightly control them, first through the budget. Those which had formerly been in opposition to the Sandinista regime are still suffering from a long period of pressure from the state and the FSLN party.

Rehabilitation and redirection of these institutions will take a great deal of effort and time. One hopes this can be done in a unifying rather than in a divisive manner, which will require some delicacy and attention to the political economy of Nicaragua. In this regard, institutional development projects should support credible, ongoing work, and not simply heave money at some group in hopes that they might do something with it. Under the current system, their first priority is likely to be protecting "nuestra tierra" for "nuestra gente," often considering as honorable and masculine the intransigent defense of extremist positions. Given the enormity of the burden of reconstructing Nicaragua and the relative richness of its endowment of agricultural resources, at least by Central American standards, such lapses into primitive tribalism are all the more tragic. Such self-defeating antics make for a negative sum game and cannot be sanctioned by a concerned donor community.

D. SUMMARY AND SUGGESTIONS

The present state of farmer-land relations in Nicaragua results both from patterns of persistence and from revolutionary change. Government policy and private investment strategy coincide in continual capital-intensive investment in the agriculture of the Pacific coastal plain, causing excessive displacement and marginalization of labor. The use of the Interior or "agricultural frontier" to absorb displaced people through the issuance of titles to parts of the "patrimonio nacional," but unaccompanied by supporting investment in infrastructure helps to degrade much of the natural resource endowment east of the Pacific plain. Neglect of the development of the skills and knowledge of smallholders and rural laborers wastes human resources and lowers the productivity of land and capital in agriculture.

Revolutionary change has altered the expectations of many of the rural poor and has dramatically increased their access to land. This access has been transformed recently into true ownership of the land, presenting them with both the opportunity to fully benefit from the fruits of their labor and the risk of losing that land through competition in markets, which have frequently been manipulated against them and for which they are poorly prepared. Many of these beneficiaries of land reform will suffer from the inheritance of past policies of mis-capitalization and consequent incongruence of capital and labor as applied to land for agricultural production.

These conditions are exacerbated by the present turmoil over property rights, which has again heightened tensions in rural areas and made insecurity of land tenure a generalized state. The National Assembly, with the power to legislate, is the scene of a debate where land is regarded as territory in a tribal sense and where laws are instruments to secure land and its benefits for those in the power. Such laws will not be considered legitimate by Nicaraguan society as a whole because of their partisan nature. Debate in the National Assembly contrasts sharply with that in La Concertacion, whose task is to promote reconciliation as the basis for socio-economic development of the nation.

The basis for a just and equitable compromise has emerged from La Concertacion. It should be embraced and refined by the Executive of the Barrios government and supported by foreign governments and their donor agencies. Even under this best case scenario, it will take perhaps two cropping seasons for experienced, entrepreneurial farmers unaffected by land invasions or counterclaims against their land to begin to make long-term investments. Risk averse farmers or those involved in disputes will take much longer, perhaps five years, to regain the confidence to make large investments beyond annual crops production, depending upon the speed and perceived legitimacy of the process of claim settlement. The alternatives to this best case scenario are likely to precipitate further conflict, insecurity and violence.

The structural transformation of the state sector under CORNAP and the heavily state-directed sector, the CAS cooperatives, will be difficult. Many of the CASs have moved to individualized production over the past several years and are likely to break up. Those CASs which, like the CORNAP production modules, are organized to function as relatively large-scale, capital-intensive units, present problems relative to the appropriateness and economic viability of their capitalization. Management experience in a competitive market is lacking.

Because of the break up of most CORNAP enterprises, the individualization of many CAS holdings, and the general insecurity in rural areas in the near term, it is anticipated that much land in a variety of forms and size holdings will come onto the market. Land markets are not well developed in Nicaragua and the potential is great for them to be manipulated and abusive to smallholders. The issue of land price becomes important in this context, as well as in the settlement of disputes. Without donor assistance to assist Barrios government interventions, land markets and land price are likely to cause very serious conflicts in rural areas.

In approaching the formulation of actual interventions in farmer-land relations, it may be wise to reconsider some of the concepts and assumptions which underlie the present state of affairs. The "reformed sector" as an immutable form and potential enclave of the state needs to be reassessed, as does the unchanging nature of "el campesino." The tendency toward centralization of administrative interventions in farmer-land relations should be questioned. Notions of the "agricultural frontier," where and what it really is and the costs and benefits of its expansion must also be analyzed.

The following are some tentative suggestions:

- An in-depth assessment of the present state of land markets generally and of land prices specifically. The latter should be in concert with the Ministry of Finance to assist in dispute reconciliation.
- Support to the CNAs in their efforts to resolve land conflicts peacefully at the local or regional level
- Consideration of land banks as means to stabilize land prices and land markets and to assist in rationalization of holdings among a range of producers.
- Serious consideration of the programs for improving labor productivity in agriculture, with an emphasis on farmer training and owner-manager development.

- An analysis of the effects of credit in the current situation and alternatives to use of land titles as collateral, especially for smallholders.
- In tandem with the land price analysis, some assessment of the current resource allocation and its effects on selection of technology in agriculture.
- Assessment of the cooperative sector, in all its manifestations, and the important role it must play in agricultural development in Nicaragua.
- An analysis of the present taxation system on land, its effects on land transfers, productivity, and income distribution.
- A general assessment of the institutional responsibilities, capacity, and current operations in agriculture.
- At some point, a detailed cadaster and an agricultural census to develop a reliable data base to support government in decision making. The cadaster should either precede or coincide with any large interventions in titling.

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V. STATISTICAL ANNEXES

A. BASIC GRAIN AND EXPORT COMMODITY SECTOR PERFORMANCES

Current Policies

Total Consumption and Production

	Area (000 ha)	Yield (mt/ha)	Production (tmt)	Total Use (tmt)	Exports (tmt)
1980	511	1.45	741	610	168
1981	585	1.27	743	551	217
1982	521	1.35	701	542	151
1983	592	1.43	847	603	221
1984	584	1.36	795	595	198
1985	509	1.45	737	608	186
1986	544	1.46	792	598	160
1987	520	1.39	723	523	159
1988	570	1.23	701	415	136
1989	559	1.22	682	539	142
1990	526	1.25	655	560	158
Ave. % Change '80-'90	0.28	-1.50	-1.22	-0.86	-0.62
1991	521	1.21	631	514	162
1992	531	1.22	648	469	171
1993	534	1.22	652	463	177
1994	541	1.23	665	465	183
1995	548	1.25	688	473	193
1996	555	1.28	713	484	202
1997	561	1.33	746	495	222
1998	565	1.35	763	500	230
1999	571	1.36	779	504	239
2000	577	1.35	781	497	247
Ave. % Change '92-'00	1.05	1.29	2.35	0.74	4.75

Current Policy

Consumption and Production of Corn

	Area (000 ha)	Yield (mt/ha)	Production (tmt)	Commercial Marketings (tmt)	Imports (tmt)	Donations (tmt)	Total Use (tmt)	----Consumption-----		Exports (tmt)	Carryover (tmt)
								Human (tmt)	Animal (tmt)		
1980	161	1.12	181	123	51	0	174	163	6	0	68
1981	205	0.93	190	143	33	0	202	188	7	0	35
1982	164	0.99	163	138	17	7	159	146	7	0	33
1983	186	1.10	205	139	129	7	220	207	7	0	82
1984	189	1.10	208	159	5	30	201	187	8	0	68
1985	132	1.46	192	155	38	16	251	239	8	0	18
1986	157	1.35	213	155	8	42	189	176	8	0	28
1987	182	1.53	278	186	0	5	181	166	9	0	32
1988	221	1.33	294	221	0	7	158	140	11	1	97
1989	228	1.27	289	227	0	11	223	205	11	2	102
1990	193	1.22	236	198	0	40	239	223	10	3	90
Ave. % Change '80-'90	1.80	0.86	2.67	4.90			3.22	3.19	4.90		
1991	182	1.35	246	185	0	25	243	226	10	4	46
1992	182	1.35	246	185	5	20	200	182	11	4	46
1993	182	1.35	246	185	10	15	200	182	11	4	45
1994	182	1.35	246	185	15	10	199	181	12	4	44
1995	182	1.41	257	193	15	10	207	188	12	5	43
1996	182	1.48	269	203	17	8	216	197	13	5	42
1997	182	1.51	275	207	19	6	220	199	13	5	41
1998	182	1.54	280	211	20	5	224	203	14	5	40
1999	182	1.57	286	215	20	5	227	206	14	6	39
2000	182	1.51	275	207	20	5	219	197	15	6	38
Ave. % Change '92-'00	0.01	1.41	1.42	1.42			1.14	0.94	3.85		

Consumption and Production of Sorghum

	Area (000 ha)	Yield (mt/ha)	Production (tmt)	Commercial Marketings (tmt)	Imports (tmt)	Donations (tmt)	Total Use (tmt)	----Consumption----		Exports (tmt)	Carryover (tmt)
								Human (tmt)	Animal (tmt)		
1980	48	1.82	88	64	0	0	61	30	30	0	14
1981	55	1.60	89	78	0	0	75	37	36	0	14
1982	39	1.33	52	65	0	0	43	31	31	0	14
1983	47	2.16	101	63	0	0	61	30	30	0	14
1984	51	2.11	107	91	0	0	87	44	43	0	14
1985	75	2.03	152	110	0	0	105	52	52	0	14
1986	82	2.08	171	140	0	0	135	67	66	0	14
1987	72	1.76	126	129	0	0	124	62	60	0	14
1988	69	1.47	102	96	0	1	93	47	45	0	14
1989	50	1.54	77	85	0	38	119	78	40	0	14
1990	45	1.87	84	60	0	38	94	65	28	0	14
Ave. % Change '80-'90	-0.78	0.27	-0.50	-0.63			4.33	7.83	-0.63		
1991	46	1.38	63	54	15	10	77	60	16	0	13
1992	48	1.43	69	59	15	8	80	62	17	0	13
1993	50	1.45	72	62	17	5	82	63	18	0	12
1994	51	1.48	75	64	17	5	84	64	18	0	12
1995	52	1.50	78	67	17	5	85	65	19	0	13
1996	53	1.53	81	70	17	5	87	66	20	0	14
1997	54	1.55	85	72	17	5	90	68	21	0	15
1998	56	1.58	88	75	17	5	94	70	23	0	15
1999	57	1.60	91	78	17	5	96	71	24	0	15
2000	58	1.63	95	81	17	5	98	72	25	0	16
Ave. % Change '92-'00	2.03	1.47	3.53	3.53			2.28	1.68	4.24		

Current Policies

Consumption and Production of Beans

	Area (000 ha)	Yield (mt/ha)	Production (tmt)	Commercial Marketings (tmt)	Imports (tmt)	Donations (tmt)	Total Use (tmt)	----Consumption----		Exports (tmt)	Carryover (tmt)
								Human (tmt)	Animal (tmt)		
1980	54	0.52	28	25	12	1	40	37	0	0	22
1981	75	0.55	41	29	24	2	43	39	0	2	30
1982	68	0.68	47	37	1	2	40	37	0	1	26
1983	88	0.63	56	43	0	3	58	53	0	0	12
1984	82	0.69	57	48	4	7	62	58	0	0	6
1985	72	0.63	46	45	8	4	54	50	0	0	8
1986	100	0.59	59	44	1	4	51	46	0	0	3
1987	72	0.52	38	41	0	7	46	42	0	0	3
1988	110	0.55	60	37	0	19	41	35	0	0	16
1989	105	0.59	62	50	0	6	53	47	0	2	16
1990	108	0.51	55	54	0	3	53	48	0	1	17
Ave. % Change '80-'90	7.13	-0.24	6.83	8.20			2.99	2.64			
1991	123	0.53	65	58	0	3	55	50	0	3	17
1992	128	0.56	72	64	0	3	57	52	0	8	15
1993	132	0.59	78	70	0	3	59	53	0	11	14
1994	138	0.62	86	76	0	3	61	55	0	14	15
1995	144	0.66	95	85	0	3	64	57	0	19	16
1996	149	0.69	103	92	0	3	66	59	0	24	16
1997	155	0.72	112	100	0	3	68	61	0	30	16
1998	160	0.76	122	109	0	3	70	63	0	36	16
1999	166	0.79	131	117	0	3	72	64	0	43	16
2000	172	0.82	141	126	0	3	74	66	0	49	16
Ave. % Change '92-'00	3.76	4.88	8.83	8.83			3.21	3.21			

Current Policy

Consumption and Production of Rice

	Area (000 ha)	Yield (mt/ha)	Production (tmt)	Commercial Marketings (tmt)	Imports (tmt)	Donations (tmt)	Total Use (tmt)	----Consumption----		Exports (tmt)	Carryover (tmt)
								Human (tmt)	Animal (tmt)		
1980	32	1.93	62	62	35	1	122	119	0	0	22
1981	41	2.14	88	71	22	1	111	107	0	0	2
1982	44	2.19	97	91	0	0	87	83	0	1	3
1983	44	2.29	101	98	0	4	101	97	0	0	3
1984	38	2.31	88	97	4	14	108	105	0	0	7
1985	35	2.27	80	86	12	20	117	114	0	0	6
1986	39	2.01	78	80	1	29	110	106	0	2	2
1987	40	1.74	69	75	17	34	120	117	0	0	5
1988	39	1.65	64	67	0	38	76	73	0	0	31
1989	45	1.50	68	67	0	28	85	81	0	10	29
1990	37	1.91	72	71	0	35	112	109	0	6	15
Ave. % Change '80-'90	1.50	-0.11	1.38	1.43			-0.78	-0.85			
1991	35	1.79	62	62	0	30	94	91	0	5	5
1992	35	1.81	64	64	5	25	87	83	0	5	5
1993	30	1.79	54	54	10	20	77	74	0	5	6
1994	28	1.84	52	52	15	15	75	72	0	5	6
1995	26	1.81	47	47	20	10	71	68	0	5	6
1996	25	1.83	45	45	25	5	69	66	0	4	7
1997	24	1.93	45	45	27	3	70	66	0	4	7
1998	22	1.85	41	41	27	3	65	62	0	4	7
1999	21	1.72	36	36	27	3	61	57	0	4	7
2000	21	1.64	34	34	27	3	59	56	0	4	8
Ave. % Change '92-'00	-6.42	-1.23	-7.57	-7.57			-4.66	-4.93			

Consumption and Production of Basic Grains

	Area (000 ha)	Yield (mt/ha)	Production (tmt)	Commercial Marketings (tmt)	Imports (tmt)	Donations (tmt)	Total Use (tmt)	----Consumption----		Exports (tmt)	Carryover (tmt)
								Human (tmt)	Animal (tmt)		
1980	296	1.21	360	273	98	2	397	349	36	0	125
1981	377	1.08	408	320	79	3	430	372	44	2	81
1982	316	1.14	359	331	18	9	348	298	37	3	76
1983	365	1.27	463	344	129	15	440	388	37	0	110
1984	360	1.28	460	395	12	50	458	393	51	0	95
1985	314	1.50	470	395	59	40	528	456	59	0	45
1986	378	1.38	521	419	10	74	485	455	74	3	45
1987	366	1.40	510	431	17	46	471	367	70	0	54
1988	438	1.19	519	421	0	65	369	295	56	1	158
1989	429	1.15	495	430	0	84	480	411	51	14	161
1990	383	1.16	446	384	0	115	499	445	38	10	136
Ave. % Change '80-'90	2.60	-0.42	2.17	3.45			2.31	2.45	0.52		
1991	386	1.13	436	359	15	68	469	426	26	12	82
1992	394	1.14	450	372	25	56	424	379	28	18	79
1993	394	1.14	450	371	37	43	418	372	29	20	76
1994	399	1.15	459	378	47	33	420	372	30	23	76
1995	404	1.18	477	392	52	28	427	378	31	28	77
1996	409	1.22	499	410	59	21	438	387	32	33	79
1997	415	1.24	516	424	63	17	447	394	34	39	79
1998	420	1.26	531	436	64	16	453	397	37	46	78
1999	426	1.28	544	446	64	16	456	399	38	53	77
2000	433	1.26	545	448	64	16	450	390	40	59	77
Ave. % Change '92-'00	1.19	1.19	2.40	2.35			0.75	0.37	4.43		

Consumption and Production of Flour

	Commercial Marketings (tmt)	Imports (tmt)	Total Use (tmt)	Human Consumption (tmt)
1980	45	0	54	54
1981	45	0	73	73
1982	53	0	24	24
1983	38	0	46	46
1984	49	0	54	54
1985	33	0	47	47
1986	45	17	62	62
1987	45	0	44	44
1988	39	1	21	21
1989	0	38	46	46
1990	40	0	38	38
Ave. % Change '80-'90	-1.23		-3.66	-3.66
1991	39	0	37	37
1992	38	0	37	37
1993	37	0	36	36
1994	37	0	36	36
1995	36	0	35	35
1996	35	0	35	35
1997	35	0	34	34
1998	34	0	34	34
1999	33	0	33	33
2000	33	0	33	33
Ave. % Change '92-'00	-1.96		-1.28	-1.28

Consumption and Production of Field Cotton

	Area (000 ha)	Yield (mt/ha)	Production (tmt)	Total Use (tmt)	Exports (tmt)
1980	94	2.35	221	202	19
1981	92	2.00	185	111	74
1982	90	2.55	230	169	61
1983	115	2.24	258	180	78
1984	112	1.86	209	127	82
1985	87	1.75	152	86	66
1986	65	2.30	149	101	48
1987	60	1.66	100	50	50
1988	40	1.76	71	37	34
1989	36	1.82	65	41	24
1990	45	1.82	82	58	24
Ave. % Change 1980-1990	-7.15	-2.51	-9.48	-11.74	2.08
1991	35	1.81	63	41	22
1992	35	1.79	63	41	22
1993	35	1.78	62	40	22
1994	35	1.77	62	40	22
1995	35	1.76	62	40	22
1996	35	1.75	61	40	21
1997	35	1.74	61	40	21
1998	35	1.73	61	39	21
1999	35	1.72	60	39	21
2000	35	1.71	60	39	21
Ave. % Change 1992-2000	0.00	-0.57	-0.57	-0.57	-0.57

Consumption and Production of Bananas

	Area (000 ha)	Yield (mt/ha)	Production Crop (tmt)	Total Use (tmt)	Exports (tmt)
1980	27	3.82	104	1	103
1981	27	3.29	90	1	89
1982	27	1.56	41	0	41
1983	22	3.58	78	0	78
1984	24	3.13	76	0	76
1985	24	3.36	80	-1	81
1986	24	3.30	79	0	78
1987	22	3.37	74	2	72
1988	20	3.40	68	-2	70
1989	21	3.82	80	10	70
1990	24	4.10	98	10	88
Ave. % Change '80-'90	-1.30	0.73	-0.58	0.00	-1.63
1991	23	4.18	98	1	97
1992	23	4.26	97	1	96
1993	22	4.34	96	1	96
1994	22	4.42	96	1	95
1995	21	4.50	95	1	94
1996	21	4.58	94	1	93
1997	20	4.67	93	1	92
1998	19	4.75	92	1	91
1999	19	4.83	91	1	90
2000	18	4.91	90	1	89
Ave. % Change '92-'00	-2.69	1.77	-0.97	0.00	-1.01

Consumption and Production of Coffee

	Area (000 ha)	Yield (mt/ha)	Production (tmt)	Total Use (tmt)	Exports (tmt)
1980	94	0.60	56	11	45
1981	88	0.69	60	9	51
1982	88	0.80	71	25	46
1983	90	0.54	48	-16	64
1984	88	0.58	51	10	40
1985	85	0.41	35	-5	39
1986	77	0.56	43	12	31
1987	72	0.53	38	1	37
1988	71	0.60	43	12	31
1989	73	0.58	42	9	33
1990	74	0.40	29	-8	37
Ave. % Change '80-'90	-2.33	-3.98	-6.22	ERR	-2.02
1991	77	0.44	34	3	31
1992	80	0.48	38	3	35
1993	82	0.52	43	4	39
1994	85	0.57	48	4	44
1995	88	0.61	54	5	49
1996	91	0.65	59	5	54
1997	91	0.83	75	7	69
1998	91	0.87	79	7	72
1999	91	0.91	83	7	76
2000	91	0.95	87	8	79
Ave. % Change '92-'00	1.68	8.91	10.73	10.73	10.73

Consumption and Production of Export Commodities

	Area (000 ha)	Yield (mt/ha)	Production (tmt)	Total Use (tmt)	Exports (tmt)
1980	215	1.77	381	213	168
1981	208	1.61	335	121	214
1982	205	1.67	342	194	148
1983	227	1.69	384	164	220
1984	224	1.50	335	137	198
1985	195	1.37	267	80	186
1986	166	1.63	271	113	157
1987	154	1.38	212	53	159
1988	132	1.38	182	47	135
1989	130	1.44	187	59	128
1990	143	1.47	209	61	148
Ave. % Change '80-'90	-4.02	-1.88	-5.82	-11.79	-1.23
1991	135	1.44	195	45	150
1992	137	1.44	198	45	153
1993	140	1.45	202	45	157
1994	142	1.45	206	45	161
1995	144	1.46	210	46	164
1996	146	1.46	214	46	169
1997	146	1.57	229	47	182
1998	145	1.59	232	47	185
1999	145	1.62	234	47	187
2000	144	1.64	236	48	189
Ave. % Change '92-'00	0.61	1.61	2.24	0.73	2.65

Total Consumption and Production, Alternative Policy

	Area (000 ha)	Yield (mt/ha)	Production (tmt)	Total Use (tmt)	Exports (tmt)
1980	511	1.45	741	610	168
1981	585	1.27	743	551	217
1982	521	1.35	701	542	151
1983	592	1.43	847	603	221
1984	584	1.36	795	595	198
1985	509	1.45	737	608	186
1986	544	1.46	792	598	160
1987	520	1.39	723	523	159
1988	570	1.23	701	415	136
1989	559	1.22	682	539	142
1990	526	1.25	655	560	158
Ave. % Change '80-'90	0.28	-1.50	-1.22	-0.86	-0.62
1991	523	1.21	635	515	167
1992	555	1.27	707	501	184
1993	573	1.31	749	533	197
1994	592	1.34	793	561	210
1995	610	1.37	839	595	224
1996	628	1.41	886	630	244
1997	642	1.47	943	667	267
1998	655	1.51	989	708	283
1999	668	1.55	1037	750	298
2000	681	1.59	1085	793	313
Ave. % Change '92-'00	2.60	2.83	5.50	5.90	6.89

Consumption and Production of Basic Grains, Alternative Policy

	Area (000 ha)	Yield (mt/ha)	Production (tmt)	Commercial Marketings (tmt)	Imports (tmt)	Donations (tmt)	Total Use (tmt)	----Consumption----		Exports (tmt)	Carryover (tmt)
								Human (tmt)	Animal (tmt)		
1980	296	1.21	360	273	98	2	397	349	36	0	125
1981	377	1.08	408	320	79	3	430	372	44	2	81
1982	316	1.14	359	331	18	9	343	298	37	3	76
1983	365	1.27	463	344	129	15	440	388	37	0	110
1984	360	1.28	460	395	12	50	458	393	51	0	95
1985	314	1.50	470	395	59	40	528	456	59	0	45
1986	378	1.38	521	419	10	74	485	396	74	3	45
1987	366	1.40	510	431	17	46	471	387	70	0	54
1988	438	1.19	519	421	0	65	369	295	56	1	158
1989	429	1.15	495	430	0	84	480	411	51	14	161
1990	383	1.16	446	384	0	115	499	445	38	10	136
Ave. % Change '80-'90	2.60	-0.42	2.17	3.45			2.31	2.45	0.52		
1991	386	1.13	436	359	15	68	470	427	26	13	81
1992	412	1.21	497	409	25	56	454	406	31	22	79
1993	425	1.25	530	435	47	43	484	433	34	26	76
1994	438	1.29	563	462	63	33	510	456	36	30	75
1995	451	1.33	598	491	81	28	543	486	39	34	78
1996	464	1.37	633	520	99	21	577	514	45	45	75
1997	477	1.41	670	550	117	17	611	544	49	50	75
1998	490	1.45	708	582	135	16	651	578	54	59	74
1999	503	1.49	748	614	153	16	692	613	59	67	72
2000	516	1.53	788	647	171	16	733	649	65	77	69
Ave. % Change '92-'00	2.87	2.97	5.93	5.91			6.17	6.03	9.56		

Consumption and Production of Corn, Alternative Policy

	Area (000 ha)	Yield (mt/ha)	Production (tmt)	Commercial Marketings (tmt)	Imports (tmt)	Donations (tmt)	Total Use (tmt)	----Consumption----		Exports (tmt)	Carryover (tmt)
								Human (tmt)	Animal (tmt)		
1980	161	1.12	181	123	51	0	174	163	6	0	68
1981	205	0.93	190	143	33	0	202	188	7	0	35
1982	164	0.99	163	138	17	7	159	146	7	0	33
1983	186	1.10	205	139	129	7	220	207	7	0	82
1984	189	1.10	208	159	5	30	201	187	8	0	68
1985	132	1.46	192	155	38	16	251	239	8	0	18
1986	157	1.35	213	155	8	42	189	176	8	0	28
1987	182	1.53	278	186	0	5	181	166	9	0	32
1988	221	1.33	294	221	0	7	158	140	11	1	97
1989	228	1.27	289	227	0	11	223	205	11	2	102
1990	193	1.22	236	198	0	40	239	223	10	3	90
Ave. % Change '80-'90	1.80	0.86	2.67	4.90			3.22	3.19	4.90		
1991	182	1.35	246	185	0	25	243	226	10	4	46
1992	185	1.48	274	206	5	20	221	204	11	4	45
1993	187	1.54	289	217	20	15	241	223	11	4	43
1994	189	1.61	303	228	31	10	257	239	12	4	42
1995	190	1.67	318	240	42	10	279	260	12	5	41
1996	192	1.74	334	251	53	8	299	279	13	5	40
1997	194	1.80	349	263	64	6	319	298	13	5	38
1998	195	1.87	365	274	75	5	340	319	14	5	37
1999	197	1.93	380	286	86	5	362	340	14	6	36
2000	199	1.99	396	298	97	5	384	362	15	6	35
Ave. % Change '92-'00	0.87	3.81	4.72	4.72			7.15	7.46	3.85		

Consumption and Production of Sorghum, Alternative Policy

	Area (000 ha)	Yield (mt/ha)	Production (tmt)	Commercial Marketings (tmt)	Imports (tmt)	Donations (tmt)	Total Use (tmt)	----Consumption----		Exports (tmt)	Carryover (tmt)
								Human (tmt)	Animal (tmt)		
1980	48	1.82	88	64	0	0	61	30	30	0	14
1981	55	1.60	89	78	0	0	75	37	36	0	14
1982	39	1.33	52	65	0	0	63	31	31	0	14
1983	47	2.16	101	63	0	0	61	30	30	0	14
1984	51	2.11	107	91	0	0	87	44	43	0	14
1985	75	2.03	152	110	0	0	105	52	52	0	14
1986	82	2.08	171	140	0	0	135	67	66	0	14
1987	72	1.76	126	129	0	0	124	62	60	0	14
1988	69	1.47	102	96	0	1	93	47	45	0	14
1989	53	1.54	77	85	0	38	119	78	40	0	14
1990	45	1.87	84	60	0	38	94	65	28	0	14
Ave. % Change '80-'90	-0.78	0.27	-0.50	-0.63			4.33	7.83	-0.63		
1991	46	1.38	63	54	15	10	77	60	16	1	12
1992	55	1.44	79	67	15	8	87	66	20	2	11
1993	59	1.47	87	74	17	5	92	68	22	2	10
1994	64	1.49	95	82	17	5	97	71	25	3	10
1995	68	1.52	104	89	17	5	102	74	27	3	11
1996	73	1.55	113	96	17	5	110	77	32	4	11
1997	77	1.58	122	104	17	5	117	80	36	4	12
1998	82	1.61	131	112	17	5	124	82	40	5	12
1999	86	1.64	141	120	17	5	131	85	45	5	13
2000	91	1.67	151	129	17	5	139	88	50	6	13
Ave. % Change '92-'00	5.72	1.65	7.46	7.46			5.37	3.32	10.53		

Consumption and Production of Beans, Alternative Policy

	Area (000 ha)	Yield (mt/ha)	Production (tmt)	Commercial Marketings (tmt)	Imports (tmt)	Donations (tmt)	Total Use (tmt)	----Consumption----		Exports (tmt)	Carryover (tmt)
								Human (tmt)	Animal (tmt)		
1980	54	0.52	28	25	12	1	40	37	0	0	22
1981	75	0.55	41	29	24	2	43	39	0	2	30
1982	68	0.68	47	37	1	2	40	37	0	1	26
1983	88	0.63	56	43	0	3	58	53	0	0	12
1984	82	0.69	57	48	4	7	62	58	0	0	6
1985	72	0.63	46	45	8	4	54	50	0	0	8
1986	100	0.59	59	44	1	4	51	46	0	0	3
1987	72	0.52	38	41	0	7	46	42	0	0	3
1988	110	0.55	60	37	0	19	41	35	0	0	16
1989	105	0.59	62	50	0	6	53	47	0	2	16
1990	108	0.51	55	54	0	3	53	48	0	1	17
Ave. % Change '80-'90	7.13	-0.24	6.83	8.20			2.99	2.64			
1991	123	0.53	65	58	0	3	56	50	0	3	17
1992	139	0.62	86	77	0	3	66	60	0	11	16
1993	147	0.66	97	87	0	3	71	65	0	15	16
1994	155	0.71	109	98	0	3	76	70	0	19	16
1995	163	0.75	122	109	0	3	81	75	0	23	19
1996	171	0.79	136	121	0	3	86	80	0	33	17
1997	179	0.84	150	134	0	3	92	85	0	38	18
1998	187	0.88	165	147	0	3	97	90	0	47	17
1999	195	0.93	181	161	0	3	102	95	0	55	16
2000	203	0.97	197	176	0	3	107	99	0	64	15
Ave. % Change '92-'00	4.85	5.80	10.93	10.93			6.28	6.55			

Consumption and Production of Rice, Alternative Policy

	Area (000 ha)	Yield (mt/ha)	Production (tmt)	Commercial Marketings (tmt)	Imports (tmt)	Donations (tmt)	Total Use (tmt)	----Consumption----		Exports (tmt)	Carryover (tmt)
								Human (tmt)	Animal (tmt)		
1980	32	1.93	62	62	35	1	122	119	0		
1981	41	2.14	88	71	22	1	111	107	0	0	22
1982	44	2.19	97	91	0	0	87	83	0	0	2
1983	44	2.29	101	98	0	4	101	97	0	1	3
1984	38	2.31	88	97	4	14	108	105	0	0	3
1985	35	2.27	80	86	12	20	117	114	0	0	7
1986	39	2.01	78	80	1	29	110	106	0	0	6
1987	40	1.74	69	75	17	34	120	117	0	2	2
1988	39	1.65	64	67	0	38	76	73	0	0	5
1989	45	1.50	68	67	0	28	85	81	0	0	31
1990	37	1.91	72	71	0	35	112	109	0	10	29
Ave. % Change '80-'90	1.50	-0.11	1.38	1.43			-0.78	-0.85		6	15
1991	35	1.79	62	62	0	30	94	91	0	5	5
1992	32	1.80	58	58	5	25	80	77	0	5	7
1993	31	1.81	57	57	10	20	80	77	0	4	7
1994	30	1.81	55	55	15	15	80	77	0	4	7
1995	29	1.82	53	53	22	10	80	77	0	3	7
1996	28	1.83	51	51	29	5	81	78	0	3	7
1997	27	1.83	49	49	36	3	84	81	0	2	7
1998	26	1.84	48	48	43	3	90	87	0	2	7
1999	25	1.84	46	46	50	3	97	93	0	1	7
2000	24	1.85	44	44	57	3	103	99	0	1	7
Ave. % Change '92-'00	-3.78	0.33	-3.47	-3.47			3.10	3.19			

Consumption and Production of Field Cotton, Alternative Policy

	Area (000 ha)	Yield (mt/ha)	Production (tmt)	Total Use (tmt)	Exports (tmt)
1980	94	2.35	221	202	19
1981	92	2.00	185	111	74
1982	90	2.55	230	169	61
1983	115	2.24	258	180	78
1984	112	1.86	209	127	82
1985	87	1.75	152	86	66
1986	65	2.30	149	101	48
1987	60	1.66	100	50	50
1988	40	1.76	71	37	34
1989	36	1.82	65	41	24
1990	45	1.82	82	58	24
Ave. % Change '80-'90	-7.15	-2.51	-9.48	-11.74	2.08
1991	35	1.81	63	41	22
1992	36	1.83	66	43	23
1993	37	1.84	67	44	24
1994	37	1.85	68	44	24
1995	38	1.86	70	45	24
1996	38	1.87	71	46	25
1997	39	1.88	72	47	25
1998	39	1.89	74	48	26
1999	40	1.90	75	49	26
2000	40	1.91	76	50	27
Ave. % Change '92-'00	1.33	0.54	1.87	1.87	1.87

Consumption and Production of Bananas, Alternative Policy

	Area (000 ha)	Yield (mt/ha)	Production Crop (tmt)	Total Use (tmt)	Exports (tmt)
1980	27	3.82	104	1	103
1981	27	3.29	90	1	89
1982	27	1.56	41	0	41
1983	22	3.58	78	0	78
1984	24	3.13	76	0	76
1985	24	3.36	80	-1	81
1986	24	3.30	79	0	78
1987	22	3.37	74	2	72
1988	20	3.40	68	-2	70
1989	21	3.82	80	10	70
1990	24	4.10	98	10	88
Ave. % Change '80-'90	-1.30	0.73	-0.58	0.00	-1.63
1991	24	4.23	100	1	99
1992	23	4.36	102	1	101
1993	23	4.49	104	1	103
1994	23	4.62	106	1	105
1995	23	4.75	108	1	107
1996	22	4.88	109	1	108
1997	22	5.01	111	1	110
1998	22	5.14	113	1	112
1999	22	5.27	114	1	113
2000	21	5.40	116	1	115
Ave. % Change '92-'00	-1.11	2.71	1.57	0.00	1.55

Consumption and Production of Coffee, Alternative Policy

	Area (000 ha)	Yield (mt/ha)	Production (tmt)	Total Use (tmt)	Exports (tmt)
1980	94	0.60	56	11	45
1981	88	0.69	60	9	51
1982	88	0.80	71	25	46
1983	90	0.54	48	-16	64
1984	88	0.58	51	10	40
1985	85	0.41	35	-5	39
1986	77	0.56	43	12	31
1987	72	0.53	38	1	37
1988	71	0.60	43	12	31
1989	73	0.58	42	9	33
1990	74	0.40	29	-8	37
Ave. % Change '80-'90	-2.33	-3.98	-6.22	ERR	-2.02
1991	79	0.45	35	3	32
1992	83	0.50	42	4	38
1993	89	0.55	49	4	44
1994	94	0.59	56	5	51
1995	99	0.64	64	6	58
1996	104	0.69	72	6	66
1997	104	0.86	90	8	82
1998	104	0.91	95	8	86
1999	104	0.96	100	9	91
2000	104	1.01	105	9	96
Ave. % Change '92-'00	2.70	9.27	12.21	12.21	12.21

Consumption and Production of Export Commodities, Alternative Policy

	Area (000 ha)	Yield (mt/ha)	Production (tmt)	Total Use (tmt)	Exports (tmt)
1980	215	1.77	381	213	168
1981	208	1.61	335	121	214
1982	205	1.67	342	194	148
1983	227	1.69	384	164	220
1984	224	1.50	335	137	198
1985	195	1.37	267	80	186
1986	166	1.63	271	113	157
1987	154	1.38	212	53	159
1988	132	1.38	182	47	135
1989	130	1.44	187	59	128
1990	143	1.47	209	61	148
Ave. % Change '80-'90	-4.02	-1.88	-5.82	-11.79	.23
1991	138	1.44	199	45	154
1992	143	1.46	210	47	162
1993	149	1.48	220	49	171
1994	154	1.49	232	50	180
1995	159	1.51	241	52	189
1996	164	1.53	252	53	199
1997	165	1.66	273	56	217
1998	165	1.70	281	57	224
1999	165	1.75	289	59	230
2000	165	1.79	297	60	237
Ave. % Change '92-'00	1.79	2.60	4.44	3.01	4.84

B. EFFECTIVE PRODUCTION RATE AND DOMESTIC RESOURCE COST

Effective Protection Rate
and
Domestic Resource Cost

=====
Cerr. (using hard labor)
=====

1991

Production Cost

	Cordoba Domestic (Cd)	Cordoba Imported (\$d)	Cordoba Total Cos (Cd+\$d)	Cordoba Taxes
Land rent (1)	200.00		200.00	
Labor (2)	338.33		338.33	
Interest (3)	0.00		0.00	
	538.33		538.33	0
Seed (4)	48.16		48.16	
Insecticides (5)	8.74	17.74	26.48	-1.31
Rodenticides (6)	1.71	3.46	5.17	-0.25
Fence maint. & deprec. (7)	0.68	0.23	0.90	-0.02
	59.28	21.43	80.71	-1.59
	597.60	21.43	619.03	-1.59
Bags (8)	2.34	2.56	4.90	
Transport (9)	16.07	5.35	21.42	-1.21
Market delivery expense	18.41	10.43	28.84	-1.21
Cost of goods sold per mt	616.01	31.86	647.87	-2.00
Taxes on transport	0.07			
Yield : cwt	10.00			
Price	35.93	40.00		
Cost/cwt	34.22	1.77	35.99	
Official exchange rate C\$/ $\text{\$}$		5.00		
$\text{\$}$		0.35		

=====
Source : Comision Nacional de Grupos Basicos

Notes :

- 1) Average rent charged.
- 2) Average agricultural wage.
- 3) Market interest rate.
- 4) Seed is assumed to be locally produced.
- 5) We assume 33% domestic content and 67% imported components.
- 6) We assume 33 % domestic content.
- 7) We assume 75 % domestic content.
- 8) We assume 80 % domestic content.
- 9) We assume 52 % domestic content.

1991

Corn (using hand labor)		C\$/cwt (Ci)	US\$/cwt (Cj)	
U.S. Pulf Price (F.O.B)			5	
Ocean freight and insurance			1.23	
C.I.F Corinto			6.23	
Exchange rate : C\$/s	Official			Equilib.
	5.00			3.90
	13/cwt			C\$/cwt
C.I.F. Corinto	31.13			45.20
Port services & handling		1.98		
		1.98		
Import Duty and Tariff Rate	0.00			
Duty and Tariff Payable		2.49		
Subtotal		4.47		
Transport Corinto Managua incl. tax			0.33	0.19
Transport Corinto Managua net of tax		2.48	3.25	0.16
Wholesale pri. Managua off=	39.36	6.95	6.49	6.39
Wholesale pri. Managua Eq=	58.05			
=====				
Market Value (Domestic Prod)		718.73		
Market Value (Intern. Prod)		708.75		1044.54
NOMINAL PROTECT. RATE EG.		3.63		
NOMINAL PROTECT. RATE OFF.		1.01		
EFFECTIVE PROTECTION RATE EG.		0.69		
EFFECTIVE PROTECTION RATE OFF.		1.01		
DRC=(Cd-Ci)/(Ci-62)		4.45		

Effective Protection Rate
and
Domestic Resource Cost

=====
Corn (with oxen)

Production Cost	1991			
	Cordoba Domestic (Cd)	Cordoba Imported (Cd)	Cordoba Total Cost (Cd+\$d)	Cordoba Taxes
Land rent (1)	200.00		200.00	
Animals	102.48		102.48	
Labor (2)	481.79		481.79	
Interest (3)	0.00		0.00	
	784.27		784.27	2.00
Seed (4)	51.00		51.00	
Fertilizers (5)	120.34	203.71	324.05	-15.09
Insecticides (6)	74.24	150.92	225.16	-11.18
Herbicides (6)	35.93	72.95	108.88	-5.40
Fence maint. & deprec. (7)	0.00	0.00	0.00	-0.22
Transport of inputs (9)	4.45	2.74	7.20	-2.34
	297.34	430.55	727.90	-32.03
Subtotal	1051.61	430.55	1482.17	-32.03
Bags (8)	4.67	1.17	5.84	-0.09
Transport (9)	35.71	21.05	57.50	-0.09
Market delivery expense	40.00	23.00	63.44	-2.77
Cost of goods sold per mt	1092.00	453.61	1545.61	-34.80
Taxes on transport	2.00			
Yield : cwt	40.00			
Price	39.92	40.00		
Cost/cwt	27.30	11.34	38.64	
Official exchange rate C\$/s		5.00		
\$d		2.27		

=====
Source : Comision Nacional de Grano Basico

Notes:

- 1) Average rent charged.
- 2) Average agricultural wage.
- 3) Market interest rate.
- 4) Seed is assumed to be locally produced.
- 5) We assume 33% domestic content and 67% imported components.
- 6) We assume 95 % domestic content.
- 7) We assume 75 % domestic content.
- 8) We assume 80 % domestic content.
- 9) We assume 62 % domestic content.

1991

Corn (with oxen)	C\$/cwt (Ci)	US\$/qc (\$i)		
U.S. Gulf Price (F.O.B)		5		
Coast. freight and insurance		1.23		
C.I.F. Corinto		6.23		
Exchange rate : C\$/\$	Official		Equilib.	
	5.22		6.23	
	C\$/cwt		C\$/cwt	
C.I.F. Corinto	31.13		49.80	
Port services & handling	1.98			
	1.98			
Import Duty and Tariff Rate	0.03			
Duty and Tariff Payable	2.49			
Subtotal	4.47			
Transport Corinto Managua incl. tax		0.30	0.19	
Transport Corinto Managua net of tax	2.48	2.88	2.16	
Wholesale price Managua off.	39.30	6.95	6.49	6.39
Wholesale price Managua equil.	58.25			
Market Value (Domestic Prod)	1535.96			
Market Value (Intern. Prod)	1575.29		2325.29	
NOMINAL PROTECT. RATE EQ.	0.09			
NOMINAL PROTECT. RATE OFF.	1.31			
EFFECTIVE PROTECTION RATE EQ.	0.69			
EFFECTIVE PROTECTION RATE OFF.	1.22			
DRC=(EQ-OFF)/(OFF-OFF)	4.63			

Effective Protection Rate
and
Domestic Resource Cost

=====
Corn (mechanized)

Production Cost	1991			
	Cordoba Domestic (Cd)	Cordoba Imported (Cd)	Cordoba Total Cos (Cd+\$d)	Cordoba Taxes
Rent (1)	200.00		200.00	
Labor (2)	308.43		308.43	
Interest on work. cap. (3)	0.00		0.00	
	508.43		508.43	0.00
Seed (4)	50.20		50.20	
Fertilizers (5)	100.34	223.71	324.05	-15.09
Insecticides (6)	98.13	139.23	237.36	-14.75
Herbicides (6)	35.93	72.95	108.88	-5.40
Rodenticides (6)	1.71	3.45	5.17	-2.36
Mechanized activities (7)	363.60	305.75	669.35	-22.94
Fence maint. & deprec. (8)	2.35	3.79	6.14	-2.02
Transport. of inputs (9)	13.25	7.51	20.76	-2.00
	674.54	757.41	1431.95	-59.43
Subtotal	1162.97	757.41	1920.37	-59.43
Sage (9)	4.67	1.17	5.84	
Transport (10)	44.34	27.33	71.67	-3.50
Market delivery expense	49.31	29.53	78.84	-2.36
Cost of goods sold per mt	1232.28	825.94	2058.21	-62.79
Taxes on transport	0.09			
Yield : cwt	50.00			
Price	39.91	40.00		
Cost/cwt	24.55	15.52	-41.15	
Official exchange rate C\$/S		5.00		
\$d		3.33		

=====
Source : Comision Nacional de Grano Basico

Notes :

- 1) Average rent charged.
- 2) Average agricultural wage.
- 3) Market interest rate.
- 4) Seed is assumed to be locally produced.
- 5) We assume 33% domestic content and 67% imported components.
- 6) We assume 25 % domestic content.
- 7) We assume 60 % domestic content.
- 8) We assume 75 % domestic content.
- 9) We assume 80 % domestic content.
- 10) We assume 62 % domestic content.

1991

Corn (mechanized)	C\$/cwt (C1)	US\$/qq (\$1)		
U.S. Gulf Price (F.O.B.)		5		
Ocean freight and insurance		1.25		
C.I.F. Corinto		6.25		
Exchange rate : C\$/US	Official		Equilib.	
	31.13		8.22	
C.I.F. Corinto	31.13		C\$/cwt	49.88
Port services & handling	1.98			
		1.98		
Import Duty and Tariff Rate	0.09			
Duty and Tariff Payable		2.49		
Subtotal		4.47		
Transport Corinto Managua incl. tax		0.30	0.19	
Transport Corinto Managua net of tax	2.48	0.26	0.15	
Wholesale price Managua off.	30.38	3.02	6.49	5.33
Wholesale price Managua equil.	58.05			
Market Value (Domestic Prod)	1095.72			
Market Value (Intern. Prod)	1060.08		2502.01	
NOMINAL PROTECT. RATE EQ.	0.30			
NOMINAL PROTECT. RATE OFF.	1.01			
EFFECTIVE PROTECTION RATE EQ.	3.72			
EFFECTIVE PROTECTION RATE OFF.	1.32			
ERDA (C2-C1)/191+55)	5.30			

Effective Protection Rate
and
Domestic Resource Cost

Sorghum (using farm machinery)

1991

Production Cost

	Cordobas Domestic (C\$)	Cordobas Imported (\$)	Cordobas Total Cos (C\$+\$)	Cordobas Taxes
Land rent (1)	200.00		200.00	
Technical services	134.67		134.67	
Labor (2)	60.53		60.53	
Interest (3)	0.00		0.00	
	395.20		395.20	0.00
Seed (4)	0.00	100.75	100.75	-3.00
Fertilizers (5)	59.52	141.15	210.68	-10.46
Insecticides (6)	22.25	45.17	67.41	-3.35
Herbicides (5)	12.82	26.00	38.85	-1.93
Mechanized activities (7)	277.37	236.30	513.65	-17.50
Input transport (8)	11.50	7.29	19.19	-0.50
	393.06	556.67	950.53	-39.20
Subtotal	789.06	556.67	1345.73	-79.20
Sags (9)	4.07	1.17	5.24	-0.25
Transport (8)	44.64	27.30	72.00	-3.30
Market delivery expense	49.31	28.53	77.84	-3.45
Cost of goods sold per mz	833.37	582.28	1420.57	-41.45
Drying and cleaning (7)	70.50	52.10	122.60	-4.00
Total cost per mz	911.27	647.30	1558.57	-46.25
Taxes on transport	0.09			
Field price	22.41	22.50		
Cost/cwt field sorghum	16.77	11.70	26.47	
Price : clean and dry sorghum	39.91	40.00		
Cost/cwt clean and dry sorghum	22.25	14.30	34.63	
Yield : cwt field sorghum				
Yield cwt dry & clean sorghum	50.00			
	45.20			
Official exch. rate C\$/s.		5.00		
\$/s		2.00		

Source: Comisión Nacional de Granos Básicos

Notes :

- 1) Average rent.
- 2) Average agricultural wage.
- 2) Average wage prevalent in the agricultural sector.
- 3) Market interest rate.
- 4) Seed is assumed to be locally produced.
- 5) We assume 33% domestic content and 67% imported components.
- 6) We assume 33 % domestic content.
- 7) We assume 75 % domestic content.
- 8) We assume 62 % domestic content.

1991

Sorghum (using farm machinery)		C\$/cwt (Ci)	US\$/cwt (\$i)
U.S. Gulf Price (F.O.B)			4.75
Ocean freight and insurance			1.22
C.I.F. Corinto			5.97
Exchange rate : C\$/\$	5.00		5.00
	Official		Equilib.
	C\$/cwt		C\$/cwt
C.I.F. Corinto	29.85		47.76
Port services & handling		1.97	
		1.97	
Import Duty and Tariff Rate	0.00		
Duty and Tariff Payable		2.39	
Subtotal		4.36	
Transport Corinto Managua incl. tax		0.30	0.19
Transport Corinto Managua net of tax	0.48	0.26	0.16
Wholesale price Managua offic.	33.20	5.34	5.13
Wholesale price Managua equil.	55.51		
=====			
Market Value (Domestic Prod)	1795.74		
Market Value (Imports Prod)	1735.73		2515.73
NOMINAL PROTECT. RATE EQ.	0.71		
NOMINAL PROTECT. RATE OFF.	1.25		
EFFECTIVE PROTECTION RATE EQ.	0.74		
EFFECTIVE PROTECTION RATE OFF.	1.27		
CRD=106 01/101-52:	4.23		

Effective Protection Rate
and
Domestic Resource Cost

Sorghum (using oxen)

1991				
Cost of production				
	Cordoba Domestic (C\$)	Cordoba Imported (C\$)	Cordoba Total Cos (C\$+E\$)	Cordoba Taxes
Land rent (1)	200.00		200.00	
Animals	102.40		102.40	
Labor (2)	369.70		369.70	
Interest on working capital (3)	0.00		0.00	0.00
	672.10		672.10	3.30
Seed (4)	0	80.6	80.60	
Fertilizers (5)	61.63	125.12	186.75	-9.27
Insecticides (6)	22.25	45.17	67.41	-3.35
Herbicides (6)	12.32	26.03	38.35	-1.93
Fence maintenance (7)	1.91	0.54	2.54	-2.25
Transport (10)	2.90	1.78	4.50	-0.22
	101.50	275.20	380.24	-14.31
Subtotal	773.60	275.20	1050.22	-14.31
Packing and sales expenses (9)	5.00	1.40	7.00	
Transport (10)	35.71	21.29	57.00	-2.39
Market delivery expenses	41.31	23.35	64.60	-2.99
Cost of goods sold per mt	815.32	322.62	1117.50	-17.50
Drying and cleaning (8)	59.32	49.66	108	
Total cost per mt	873.32	352.30	1225.62	-17.50
Taxes on transport	0.00			
Field price	22.42	22.50		
Cost/cwt field sorghum	20.37	7.57	27.94	
Price : clean and dry sorghum	39.92	40.00		
Cost/cwt clean and dry sorghum	24.25	9.75	34.04	
Yield : cwt field sorghum	40.00			
Yield : cwt dry & clean sorghum	36.00			
Official exch. rate C\$/E.		5.20		
E\$		1.96		

Source: Comisión Nacional de Granos Básicos

Notes :

- 1) Average rent.
- 2) Average agricultural wage.
- 3) Market interest rate.
- 4) We assume that seed is locally produced.
- 5) We assume a 33 % domestic content and an imported content of 67
- 6) We assume 33 % domestic content.
- 7) We assume 75 % domestic content.

1991

Sorghum (using oxen)	C\$/cwt (C1)	US\$/cwt (#1)		
U.S. Gulf Price (F.O.B)		4.75		
Ocean freight and insurance		1.22		
C.I.F. Corinto		5.97		
Official exch. rate : C\$/#	3.20			
	Offic.		Equilib.	
	C\$/cwt		C\$/cwt	
C.I.F. Corinto	29.95		47.76	
Port services & handling		1.97		
		1.97		
Import Duty and Tariff Rate	0.08			
Duty and Tariff Payable		2.39		
Subtotal		4.36		
Transport Corinto Managua incl. tax		0.30	0.16	
Transport Corinto Managua net of tax		0.26	0.16	
Wholesale pri. Managua off-	33.23	5.34	6.23	5.13
Wholesale pri. Managua Eq-	33.01			
Market Value (Domestic Prod.)	1437.03			
Market Value (Intern. Prod.)	1337.83		2012.59	
NOMINAL PROTECT. RATE EQ.	0.71			
NOMINAL PROTECT. RATE OFF.	1.05			
EFFECTIVE PROTECTION RATE EQ.	0.73			
EFFECTIVE PROTECTION RATE OFF.	1.23			
ERCP(198-01.7) (1982)	4.30			

Effective Protection Rate
and
Domestic Resource Cost

Edible beans (using no tillage)

Production Cost	1991			
	Cordoba Domestic (Cd)	Cordoba Imported (\$d)	Cordoba Total Cos (Cd+\$d)	Cordoba Taxes
Land rent (1)	200.00		200.00	
Labor (2)	107.94		107.94	
Interest (3)	0.00		0.00	0.00
	307.94		307.94	0.00
Seed (4)	117.60		117.60	
Fertilizers (5)	36.70	74.32	111.32	-5.52
Other chemicals (6)	179.31	364.05	543.36	-26.97
Mechanized activities (7)	53.67	45.72	99.39	-3.35
Input transport (9)	2.68	1.64	4.32	-0.32
	339.95	485.93	825.88	-36.07
Subtotal	657.93	485.93	1143.86	-36.07
Bags (8)	4.37	1.17	5.54	
Transport (9)	13.39	8.21	21.60	-1.31
Market delivery expense	13.05	3.38	16.43	-1.31
Cost of goods sold per mt	715.95	498.21	1214.16	-37.05
Taxes on transport	0.00			
Yield : cwt	15.02			
Price	109.92	110.02		
Cost/cwt	47.73	33.02	60.75	
Official exchange rate C\$/s		5.20		
\$d		6.68		

Source : Comision Nacional de Granos Basicos

Notes :

- 1) Average rent charged.
- 2) Average agricultural wage.
- 3) Market interest rate.
- 4) Seed is assumed to be locally produced.
- 5) We assume 33% domestic content and 67% imported components.
- 6) We assume 25 % domestic content.
- 7) We assume 75 % domestic content.
- 8) We assume 80 % domestic content.
- 9) We assume 62 % domestic content.

Edible beans (using no tillage)	C\$/cwt (C1)	US\$/q0 (\$1)
U.S. Gulf Price (F.O.B)		1.30
Ocean freight and insurance		2.55
C.I.F. Corinto		38.35
Exchange rate : C/\$	Official	Equilib.
	5.30	8.00
	C\$/cwt	C\$/cwt
C.I.F. Corinto	164.78	253.64
Port services & handling	5.11	
	5.11	
Import Duty and Tariff Rate	0.06	
Duty and Tariff Payable	13.18	
Subtotal:	13.25	
Transport Corinto Managua incl. tax		0.30 0.19
Transport Corinto Managua net of tax	2.48	0.26 0.16
Wholesale price Managua off.	126.85	20.77 33.02 33.12
Wholesale price Managua equil.	205.72	
Market Value (Domestic Prod)	1848.70	
Market Value (Intern. Prod)	3503.30	4205.77
NOMINAL PROTECT. RATE a1.	0.52	
NOMINAL PROTECT. RATE OFF.	0.55	
EFFECTIVE PROTECTION RATE EQ.	0.32	
EFFECTIVE PROTECTION RATE OFF.	0.52	
ERC=(C2-C1)/(C1-10)	1.01	

Effective Protection Rate
and
Domestic Resource Cost

Edible beans (using hand labor)

1991				
Production Cost				
	Cordoba Domestic (Cd)	Cordoba Imported (\$d)	Cordoba Total Cos (Cd+\$d)	Cordoba Taxes
Land rent (1)	200.00		200.00	
Labor (2)	367.02		367.02	
Interest (3)	0.00		0.00	0.00
	567.02		567.02	0.00
Seed (4)	88.20		88.20	
Insecticides (5)	16.13	32.75	48.88	-2.40
Insecticide for slugs (5)	20.25	40.73	60.74	-3.01
Fence maint. & depr. (6)	2.38	0.75	3.17	-0.06
Input transport	2.20	0.22	2.20	0.00
	129.75	74.24	202.99	-5.52
Subtotal	696.78	74.24	703.02	-5.52
Bags (7)	2.34	3.56	2.52	
Transport (8)	9.25	3.03	10.00	-2.47
Market delivery expense	3.59	4.41	13.00	-1.47
Cost of goods sold cwt	703.02	70.83	781.02	-3.97
Taxes on transport	0.20			
Yield : cwt	12.22			
Price	109.95	110.20		
Cost/cwt	78.24	7.97	78.12	
Official exchange rate C\$/s		5.00		
\$d		1.57		

Source : Comision Nacional de Granos Basicos

Notes :

- 1) Average rent charged.
- 2) Average agricultural wage.
- 3) Market interest rate.
- 4) Seed is assumed to be locally produced.
- 5) We assume 33% domestic content and 67% imported components.
- 6) We assume 33 % domestic content.
- 7) We assume 50 % domestic content.
- 8) We assume 52 % domestic content.

1591

Edible beans (using hard labor)	C\$/cwt (C)	US\$/cwt (\$)	
U.S. Gulf Price (F.O.B)		30.00	
Ocean freight and insurance		2.56	
C.I.F. Corinto		32.56	
Exchange rate : C.\$	Official 5.00	Equilibr. 8.00	
C.I.F. Corinto	C\$/cwt 164.78	C\$/cwt 263.64	
Port services & handling	5.11		
	5.11		
Import Duty and Tariff Rate	0.08		
Duty and Tariff Payable	13.18		
Subtotal	18.29		
Transport Corinto Managua incl. tax		2.50	2.19
Transport Corinto Managua net of tax	2.42	0.26	2.15
Wholesale price Managua off.	166.95	20.77	33.12
Wholesale price Managua equil.	235.70		33.12
Market Value (Domestic Prod)	1090.52		
Market Value (Intern. Prod)	1313.52		2357.12
NOMINAL PROTECT. RATE EQ.	0.38		
NOMINAL PROTECT. RATE OFF.	2.59		
EFFECTIVE PROTECTION RATE EQ.	0.37		
EFFECTIVE PROTECTION RATE OFF.	2.57		
NRE=100-D17/N1-95	1.55		

Effective Protection Rate
and
Domestic Resource Cost

Edible beans (using oxen)

		1991			
Production Cost		Cordoba Domestic (Cd)	Cordoba Imported (\$d)	Cordoba Total Cos (Cd+\$d)	Cordoba Taxes
Land rent (1)		200.00		200.00	
Animals		102.48		102.48	
Labor (2)		306.30		306.30	
Interest on work. cap. (3)		0.00		0.00	0.00
		608.78		608.78	0.00
Seed (4)		102.90		102.90	
Fertilizers (5)		33.72	74.52	111.22	-5.52
Insecticides (6)		88.91	180.51	269.42	-13.37
Herbicides (6)		17.36	35.28	52.65	-2.31
Fungicides (6)		30.23	61.51	91.74	-4.56
Insecticide for slugs (6)		23.25	40.78	64.03	-3.31
Fence maint. & depre. (7)		2.33	2.79	5.12	-2.25
Transport. inputs (8)		2.33	1.34	4.32	-0.32
		331.28	354.55	685.83	-29.34
Subtotal		612.26	394.95	1025.21	-29.34
Sage (9)		3.50	2.65	6.15	-1.35
Transport (9)		12.71	6.57	19.28	-1.31
Market delivery expense		14.22	7.44	21.66	-2.31
Cost of goods sold per mz		924.23	402.39	1326.62	-30.14
Taxes on transport		3.07		3.07	
Yield : cwt		12.00		12.00	
Price		109.50	110.00	109.75	
Cost/cwt		77.02	33.53	77.02	
Official exchange rate C\$/s			5.20		
\$d			5.71		

Source : Comision Nacional de Grandes Basicos

Notes :

- 1) Average rent charged.
- 2) Average agricultural wage.
- 3) Market interest rate.
- 4) Seed is assumed to be locally produced.
- 5) We assume 33% domestic content and 67% imported components.
- 6) We assume 25 % domestic content.
- 7) We assume 75 % domestic content.
- 8) We assume 80 % domestic content.
- 9) We assume 62 % domestic content.

Edible beans (using oxen)		C\$/cwt (Ci)	US\$/qq (\$i)	

U.S. Gulf Price (F.O.B)			20	
Ocean freight and insurance			2.36	

C.I.F. Corinto			22.36	
Exchange rate : C\$/\$	5.20		3.20	
	Offic.		Equilib.	
	C\$/cwt		C\$/cwt	
C.I.F. Corinto	154.76		263.64	

Port services & handling			5.11	

			5.11	

Import Duty and Tariff Rate	0.08			
Duty and Tariff Payable		13.18		

Subtotal			13.29	
Transport Corinto Managua incl. tax			0.30	0.19
Transport Corinto Managua net of tax			2.48	2.16

Wholesale price Managua off.	165.05	22.77	33.22	33.12
Wholesale price Managua equil.	285.70			
=====				
Market Value (Domestic Prod)	1219.19			
Market Value (Intern. Prod)	2242.24		3422.62	
NOMINAL PROTECT. RATE EG.	2.30			
NOMINAL PROTECT. RATE OFF.	0.59			
EFFECTIVE PROTECTION RATE EG.	0.32			
EFFECTIVE PROTECTION RATE OFF.	0.50			
SRP=(C2-C1)/(C1-C3)	2.12			

Effective Protection Rate
and
Domestic Resource Cost.

=====

Edible beans (using farm machinery and irrigation)

1991

Production Cost

	Cordeba Domestic (Cd)	Cordeba Imported (\$d)	Cordeba Total Cos (Cd+\$d)	Cordeba Taxes
Land rent (1)	200.00		200.00	
Labor (2)	221.90		221.90	
Interest (3)	0.00		0.00	0.00
	421.90		421.90	0.00
Seed (4)	117.50		117.50	
Fertilizers (5)	55.05	111.70	166.63	-8.00
Insecticides (6)	32.10	135.63	167.77	-12.35
Herbicides (6)	42.00	85.43	127.50	-5.30
Fungicides (9)	28.45	57.77	86.22	-4.00
Insecticide for blugs (9)	40.05	31.31	71.35	-5.00
Other chemicals (9)	23.35	33.52	56.84	-5.00
Mechanized activities (7)	230.00	230.00	460.00	-10.00
Fence maint. & depr. (8)	74.34	33.34	107.68	-4.75
Input transport (10)	4.70	0.50	5.20	-0.00
Man transport (10)	9.00	3.67	12.67	-0.45
Electricity (11)	62.04	41.36	103.40	-3.75
	835.31	512.65	1347.95	-50.00
Subtotal	1255.31	510.65	1765.95	-50.00
Sacks (9)	3.50	0.00	3.50	
Transport (10)	17.66	12.94	30.60	-1.34
Market delivery expense	21.35	11.32	32.68	-1.34
Cost of goods sold per mz	1275.57	530.47	1806.04	-70.41
Taxes on transport	0.11		0.11	
Yield : cwt	20.00		20.00	
Price	129.00	110.00	119.00	
Cost per cwt	63.78	46.52	54.00	
Official exchange rate C\$/S		5.00		
\$d		9.00		

=====

Source : Comision Nacional de Granos Basicos

Notes :

- 1) Average rent charged.
- 2) Average agricultural wage.
- 3) Market interest rate.
- 4) Seed is assumed to be locally produced.
- 5) We assume 33% domestic content and 67% imported components.
- 6) We assume 33 % domestic content.
- 7) We assume 75 % domestic content.
- 8) We assume 60 % domestic content.
- 9) We assume 80 % domestic content.

- 10) We assume 62 % domestic content.
- 11) We assume 60 % domestic content.

1991

Edible beans with machinery and irrigation		C\$/cwt (C1)	US\$/cwt (#1)
U.S. Gulf Price (F.O.B)			32
Ocean freight and insurance			3.36
C.I.F. Corinto			35.36
Exchange rate : C\$/#	Official		Equilibr.
	5.00		9.20
	C\$/cwt		C\$/cwt
C.I.F. Corinto	164.78		263.64
Port services & handling		5.11	
		5.11	
Import Duty and Tariff Rate	0.23		
Duty and Tariff Payable		13.18	
Subtotal		18.25	
Transport Corinto Managua incl. tax			0.30 0.19
Transport Corinto Managua net of tax		2.48	0.26 0.12
Wholesale price Managua off.		153.05	24.77 33.22 33.12
Wholesale price Managua equil.		238.72	
Market Value (Domestic Prod)		3,677.05	
Market Value (Intern. Prod)		3737.07	5714.37
NOMINAL PROTECT. RATE EQ.		0.30	
NOMINAL PROTECT. RATE OFF.		0.55	
EFFECTIVE PROTECTION RATE EQ.		0.29	
EFFECTIVE PROTECTION RATE OFF.		0.45	
SMP=EQ-OFF/(100-56)		1.30	

Effective Protection Rate
and
Domestic Resource Cost

Rice (using hand labor)

1991				
Production Cost				
	Cordobas Domestic (Cd)	Cordobas Imported (\$d)	Cordobas Total Cost (Cd+\$d)	Cordobas Taxes
Rent (1)	200.00		200.00	
Labor (2)	333.09		333.09	
Interest (3)	0.00		0.00	
	533.09		533.09	0.00
Seed (4)	117.60		117.60	
Fertilizers (5)	34.38	69.80	104.18	-5.17
Insecticides (6)	6.63	13.47	20.10	-1.00
Fence maint. & depr. (7)	0.54	0.18	0.72	-0.01
Input transport (8)	0.71	0.44	1.15	-0.05
	159.86	83.88	243.75	-6.23
Agricultural cost	692.95	83.88	776.84	-6.23
Bags (9)	0.73	2.19	2.92	-0.16
Transport (8)	13.39	3.21	21.60	-1.01
Market delivery expense	14.12	10.40	24.52	-1.17
Total agric. cost/mz rough	707.08	94.28	801.36	-7.41
Cost/qa rough	35.35	4.71	40.07	
Drying & cleaning (10)	32.40	27.60	60.00	-2.04
Milling (10)	71.60	61.00	132.60	-4.52
Bags (9)	14.21	3.55	17.76	-0.36
Transport (8)	10.71	6.57	17.28	-0.91
Total cost per mz	836.00	192.99	1029.00	-15.04
Taxes on transport	0.16			
Yield (rough) : cwt	20.00			
Yield (dry & clean) : cwt	17.00			
Yield (milled) : cwt	12.00			
Price of milled rice	104.84	105.00		
Cost/cwt	69.67	16.08	85.75	
Official exchange rate C\$/		5.00		
\$d		3.22		

Source : Comision Nacional de Granos Basicos

Notes :

- 1) Average rent charged.
- 2) Average agricultural wage.
- 3) Market interest rate.
- 4) Seed is assumed to be locally produced.
- 5) We assume 33% domestic content and 67% imported components.

- 6) We assume 25 % domestic content.
- 7) We assume 75 % domestic content.
- 8) We assume 62 % domestic content.
- 9) We assume 80 % domestic content.
- 10) We assume 60 % domestic content.

=====				
1991				
Rice (using hand labor)		C\$/cwt (Ci)	US\$/cwt (\$i)	

U.S. Gulf Price (F.O.B)			16.19	
Ocean freight and insurance			2.955	

C.I.F Corinto			13.145	
Official exch. rate : C\$/	5.00			
	Offic.			Equilib.
C.I.F. Corinto	C\$/cwt			C\$/cwt
	55.73			153.16
Port services & handling		5.11		

		5.11		
Import Duty and Tariff Rate	0.00			
Duty and Tariff Payable		7.66		

Subtotal		12.77		
Transport Corinto Managua incl. tax			0.30	0.19
Transport Corinto Managua net of tax		2.48	0.26	0.16

Wholesale pri. Managua off=	112.28	15.25	19.41	19.31
Wholesale pri. Managua Eq=	169.72			
=====				
Market Value (Domestic Prc)		1258.13		
Market Value (Intern. Prc)		1347.36		2036.58
NOMINAL PROTECT. RATE EQ.		0.62		
NOMINAL PROTECT. RATE OFF.		0.93		
EFFECTIVE PROTECTION RATE EQ.		0.61		
EFFECTIVE PROTECTION RATE OFF.		0.93		
DRC=(Cd-Ci)/(\$i-\$d)		3.36		

Effective Protection Rate
and
Domestic Resource Cost

Rice (with oxen)

1961

Production Cost

	Cordobas Domestic (Cd)	Cordobas Imported (\$d)	Cordobas Total Cos (Cd+\$d)	Cordobas Taxes
Land rent (1)	200.00		200.00	
Animals	102.48		102.48	
Labor (2)	279.51		279.51	
Interest on work. cap. (3)	0.00		0.00	
	581.99		581.99	0.20
Seed (4)	147.00		147.00	
Fertilizers (5)	45.84	93.05	138.89	-5.89
Insecticides (6)	25.12	53.25	78.37	-3.93
Herbicides (6)	43.20	67.84	111.04	-6.51
Fungicides (6)	22.60	48.07	70.67	-3.56
Rodenticides (6)	9.75	19.73	29.48	-1.47
Fence maint. & deprec. (7)	0.30	2.25	2.55	-0.22
Input transport (8)	2.95	1.31	4.26	-0.22
	268.69	303.95	572.64	-22.60
Agricultural cost	380.95	303.95	684.90	-22.60
Sage (9)	1.10	3.15	4.25	-0.24
Transport (10)	35.71	21.60	57.31	-2.51
Market delivery expense	35.31	25.17	60.48	-2.93
Total agric. cost/mz rough	917.73	329.12	1246.85	-25.53
Cost/qq rough	22.94	3.23	31.17	
Drying & cleaning (10)	34.00	55.20	89.20	-4.29
Milling (12)	143.21	121.99	265.20	-9.04
Sage (9)	28.42	7.10	35.52	-0.53
Transport (10)	21.43	13.13	34.56	-1.61
Total agroindustr. cost/mz	1175.63	526.55	1702.18	-40.20
Taxes on transportation		0.10		
Yield (rough) : cwt	40.00			
Yield (dry & clean) : cwt	34.00			
Yield (milled) : cwt	24.00			
Price of milled rice	104.62	105.00		
Cost/cwt	48.98	21.94	70.92	
Off. exchange rate C\$/ \$d		5.00		
		4.39		

Notes:

- 1) Average rent charged.
- 2) Average agricultural wage.
- 3) Market interest rate.
- 4) Seed is assumed to be locally produced.
- 5) We assume 33% domestic content and 67% imported components.

Source: Comision Nacional de Granos Basicos

- 6) We assume 33 % domestic content.
- 7) We assume 75 % domestic content.
- 8) We assume 52 % domestic content.
- 9) We assume 30 % domestic content.
- 10) We assume 62 % domestic content.

=====			
1991			
Rice (with oxen)	C\$/cwt (C#)	US\$/cwt (#)	

U.S. Gulf Price (F.O.B)		16.19	
Ocean freight and insurance		2.955	

C.I.F. Corinto		19.145	
Official exch. rate : C\$/#	5.20		
	Offic.		Equilib.
	C\$/cwt		C\$/cwt
C.I.F. Corinto	35.73		153.13

Port services & handling	5.11		

	5.11		
Import Duty and Tariff Rate	0.20		
Duty and Tariff Payable		7.55	

Electoral	12.77		
Transport Corinto Managua incl. tax		0.32	0.13
Transport Corinto Managua net of tax	2.48	0.32	0.13

Wholesale pri. Managua off=	113.28	15.35	19.41
Wholesale pri. Managua Eq=	169.72		19.31
=====			
Market Value (Domestic Prod)	2515.70		
Market Value (Intern. Prod)	2534.72		4273.16
NOMINAL PROTECT. RATE EQ.	0.52		
NOMINAL PROTECT. RATE OFF.	0.33		
EFFECTIVE PROTECTION RATE EQ.	0.61		
EFFECTIVE PROTECTION RATE OFF.	0.32		
ERC=(C2-C1)/(#1-#0)	2.05		

Effective Protection Rate
 Domestic Resource Cost

Rice (using farm machinery and irrigation)

Production Cost	1991			
	Domestic (C\$)	Imported (US\$)	Total Cost (C\$+US\$)	Condicbas Taxes
Rent (1)	200.00		200.00	
Labor (2)	163.50		163.50	
Interest (3)	0.00		0.00	
	363.50		363.50	0.00
Seed (4)	323.40		323.40	
Fertilizers (5)	60.21	162.66	243.09	-10.06
Insecticides (6)	48.83	99.14	147.97	-7.34
Herbicides (5)	64.14	132.22	196.36	-9.65
Fungicides & rodent. (6)	37.64	79.42	114.06	-5.03
Fence mainten. & deprec. (7)	0.32	0.11	0.42	-0.31
Mechanized activities (3)	1119.35	953.52	2072.87	-72.63
Electricity (9)	57.20	64.60	121.80	-5.33
Fuels (10)	35.40	93.40	128.80	-49.20
Input transport (11)	27.52	16.37	44.39	-2.37
	1037.01	1082.94	2120.05	-162.51
Agricultural cost	2180.51	1922.34	3862.54	-162.51
Sacks (12)	17.52	4.02	21.50	-0.33
Transport (11)	62.52	26.30	100.30	-4.70
Market delivery expense	30.02	42.33	102.70	-5.02
Total agric. cost/wg rough Cost/qc rough	2240.53	1945.22	3685.54	-167.54
	33.44	22.50	52.94	
Drying & cleaning (3)	112.40	96.80	210.00	-7.16
Milling (5)	250.61	213.49	464.10	-15.01
Sacks (12)	49.73	12.40	62.15	-0.52
Transport (11)	37.50	32.56	70.48	-3.32
Total cost/mz	2791.76	1990.52	4732.28	-154.35
Taxes on transport	0.16			
Yield (rough) : cwt	70.00			
Yield (dry & clean) : cwt	59.50			
Yield (milled) : cwt	43.00			
Price of milled rice	124.22	125.00		
Cost/cwt	35.47	47.39	113.35	
Off. exchange rate C\$/S		5.00		
\$d		9.48		

Source : Comision Nacional de Granos Basicos

- 5) We assume 25 % domestic content.
- 7) We assume 75 % domestic content.
- 8) We assume 50 % domestic content.
- 9) We assume 30 % domestic content.
- 10) We assume 50 % domestic content.
- 11) We assume 25 % domestic content.

Notes :

- 1) Average rent charged.
- 2) Average agricultural wage.
- 3) Market interest rate.
- 4) Seed is assumed to be locally produced.
- 5) We assume 33% domestic content and 67% imported components.

=====				
1991				
Rice (machinery and irrigation)	C\$/cwt	US\$/cwt		
	(Ci)	(#i)		

U.S. Gulf Price (F.O.B)		16.19		
Ocean freight and insurance		2.955		

C.I.F. Corinto		19.145		
Official exch. rate : C\$/#	5.38			
	Offic.		Equilib.	
	C\$/cwt		C\$/cwt	
C.I.F. Corinto	95.73		153.13	

Port services & handling	5.11			

	5.11			

Import Duty and Tariff Rate	3.88			
Duty and Tariff Payable	7.66			

Subtotal	12.77			
Transport Corinto Managua incl. tax		0.58	0.13	
Transport Corinto Managua net of tax	2.45	0.35	0.13	

Wholesale price Managua off#	112.83	15.25	13.41	15.31
Wholesale price Managua Eq#	153.73			
=====				
Market Value (Domestic Prod)	4432.47			
Market Value (Intern. Prod)	4715.77		7126.24	
NOMINAL PROTECT. RATE EG.	2.52			
NOMINAL PROTECT. RATE OFF.	0.93			
EFFECTIVE PROTECTION RATE EG.	0.59			
EFFECTIVE PROTECTION RATE OFF.	0.50			
ERC=(100-Ci)/(101-#i)	5.15			

Domestic content	Imported content	Unit costs of production	
Fertilizers		Road transport : Managua Corinto	
0.33	0.67	C\$ /cwt.....	4.00
Other chemicals		Road transport from farmgate	
0.33	0.67	to market or proc. plant.	1.44
Machinery		Agricultural wage	
2.54	0.46	C\$ per person/day.....	4.35
Transport		Cost of food	
2.62	0.38	C\$ per person/day.....	4.07
Fuels		Land rent for all farm types	
0.50	0.50	C\$ per mz.....	200.00
Technical & admin. services		Electricity C\$ per Kwh...	
0.65	0.35	Coffee processing /cwt...	42.55
Packing material			
0.00	0.20		
Investment in banana plantation			
0.61	0.39		
Fence maintenance & depreciation			
0.75	0.25	Input prices	
Electricity			
0.60	0.40	Fertilizers	
Aerial applications		fertiliz. 18-46-0	
2.63	0.37	fertiliz. 12-30-10	
Ginning		urea 46 %	
0.75	0.25		
----- Insecticidas			
Tariffs & taxes % of import val.		Furadan 5% kg 6.21	
		Filitox 600 EC lt 43.44	
Fertilizers		Decis lt 69.61	
0.00		Citroiane 250 EC lt 45.31	
Other chemicals		Lorsban 4E lt 48.00	
0.00		Counter lb 5.06	
Transport		Methyl Parathion 4E lt 20.12	
0.14		Dionaphe 5% G kg 2.00	
Fuel		Thimet lb 5.50	
0.60		Cypermat lt 141.7	
Machinery			
0.00		Herbicidas	
Seed		Gramoxone lt 24.65	
0.04		Grinextra lt 31.11	
Electricity		Prowl 500 lt 52.66	
0.10		Atrazina 80 WP kg 25.90	
Local taxes on coffee		Dual lt 76.63	
0.02		2-4-D lt 15.17	
		Propanil 4E lt 21.85	
		Fusilade lt 85.00	

Exchange rates		Fungicidas	
		Benomil kg 95.40	
Official		Benlate kg 95.40	
5.00		Dithane M-45 kg 20.40	
"Equilibrium" (1)		Hinosan 50 EC lt 69.79	
8.00			
----- Insecticidas for slugs			
Internat. prices U.S. \$		Ortho-B kg 13.35	

Coffee	84.00	Rodenticide	
Cotton (2)	74.00	Klerat kg 23.27	
Bananas	19.00	Racumin kg 10.82	
Melon	6.83	Fosforuro de zinc kg 10.34	

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Effective Protection Rate
and
Domestic Resource Cost

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Melon

Production Cost	1991			
	Cordobas Domestic (Cd)	Cordobas Imported (\$d)	Cordobas Total Cost (Cd+\$d)	Cordobas Taxes
Land rent (1)	200.00		200.00	
Labor (2)	2324.20		2324.20	
Interest (3)	0.00		0.00	
	2524.20		2524.20	0.00
Seed (4)	256.95		256.95	
Fertilizers (5)	292.15	593.15	885.30	-43.94
Other chemicals (6)	401.84	815.86	1217.70	-60.43
Mechanized activities (7)	1593.92	1357.78	2951.70	-100.58
Transport. to plant (8)	909.01	557.14	1466.15	-58.42
	3453.87	3323.93	6777.80	-273.37
Subtotal	5976.07	3323.93	9302.20	-273.37
Sales Cost				
Packing (9)	7375.32	1043.83	9219.15	-1382.87
Labor	882.7		882.7	
Admin. services (10)	327.68	165.67	473.35	0.00
Transport to Corinto (3)	178.50	109.40	287.90	-13.44
Subtotal	8744.20	2118.90	10863.10	-1396.31
Total	14722.27	5442.83	20165.10	-1659.68
Yield crates/Ha	1657.20			
Taxes on transport	0.88			
F.A.S. Price	15.62	16.50		
Cost/crate	8.88	3.28	12.17	
Official exchange rate C\$/ \$d		5.00		
		0.66		

Source : A.P.E.N.N.

Notes :

- 1) Average land rent.
- 2) Average agricultural wage.
- 3) Market interest rate.
- 4) Assumption : seed is locally produced.
- 5) Assumption : domestic content 33 per cent.
- 6) Assumption : domestic content 33 per cent.
- 7) Estimate : domestic content 54 per cent.
- 8) Estimate : domestic content 62 per cent.
- 9) Assumption : domestic content 80 per cent.
- 10) Assumption : domestic content 65 per cent.

1991

Melon Honeydew	C\$/crate	US\$/crate		
	(Ci)	(\$i)		
U.S. Gulf Price (C.I.F.)		6.83		
Ocean Freight and Insurance		3.33		
F.O.B. Corinto		3.5		
Exchange Rate : C\$/	5.00			
	Offic.		Equilib.	
	C\$/crate		C\$/crate	
F.O.B. Corinto	17.50		26.00	
Port services & handling		1		
Export Tariff Rate	0.00			
Export Tariff Payable		0.00		
Port Services & duties		1.00		
Wholesale price Corinto offic	18.50	1.00	3.50	3.50
Wholesale price Corinto equil.	29.00			
Market Value (Domestic Price)	25075.77			
Market Value (Internat. Price)	30654.50		46053.00	
EFFECTIVE PROTECTION RATE EQ.		0.52		
EFFECTIVE PROTECTION RATE OFF.		2.92		
DRC=(Cd-Ci)/(\$i-\$d)		2.77		

Effective Protection Rate
and
Domestic Resource Cost

Cotton

1991				
Production Cost				
	Cordobas Domestic (Cd)	Cordobas Imported (\$d)	Cordobas Total Cost (Cd+\$d)	Cordobas Taxes
Land rent (1)	200.00		200.00	
Technic. & admin. services (2)	155.233	83.587	238.82	
Labor (3)	653.95		653.95	
Interest on work. cap. (4)	192.64		192.64	
	1201.82	83.59	1285.41	0.00
Seed (5)	58.00		58.00	0.00
Fertilizers (6)	85.61	173.82	259.44	-12.88
Herbicides (6)	27.33	55.50	82.83	-4.11
Biological agents (6)	115.38	234.27	349.65	-17.35
Other chemicals (6)	432.25	879.63	1312.88	-65.16
Mechanized activities (7)	294.44	250.81	545.25	-18.58
Aerial applications (8)	262.41	154.11	416.52	-11.42
Input transport (9)	3.82	2.34	6.16	-2.29
	1280.24	1750.48	3030.73	-129.73
Subtotal	2482.07	1834.07	4316.14	-129.78
Sales Cost				
Binning expense (10)	446.35	147.20	593.55	-10.90
Transport to Domingo (9)	22.56	13.83	36.39	-1.70
Local taxes	47.25		47.25	-47.25
ENAL commission	66.20		66.20	
Technolog. Development Fund	94.50		94.50	
Nat. Cotton Grading Bureau	15.96		15.96	
	712.82	161.03	873.85	-59.85
Subtotal	712.82	161.03	873.85	-59.85
Revenue from sale of seed (11)	-118.13	-354.38	-472.50	
	3076.76	1640.72	4717.49	-189.63
Total	3076.76	1640.72	4717.49	-189.63
Taxes on transport /cwt	0.16			
Yield : cwt per mz	12.77			
F.A.S. Price	365.09	365.25		
Cost per cwt	240.94	128.40	369.42	
Official exchange rate C\$/\$. \$d		5.00	25.70	

Source : Comision Nacional del Algodon

Notes :

- | | |
|---|--|
| <p>1) Average land rent.
2) Assumption : domestic content 65 per cent.
3) Average agricultural wage.
4) Market interest rate.
5) Assumption : seed is locally produced.</p> | <p>6) Assumption : domestic content 33 per cent.
7) Estimate : domestic content 54 per cent.
8) Estimate : domestic content 63 per cent.
9) Estimate : domestic content 62 per cent.
10) Estimate : domestic content 75 per cent.
11) Estimate : yield of 17.5 cwt/mz of seed at a price of 27 C\$;
Assumption : 75 % of this sub-product is exported.</p> |
|---|--|

1991					
Cotton		C\$/cwt (Ci)	US\$/cwt (\$i)		
U.S. Gulf Price (C.I.F.)					
Ocean Freight and Insurance					
F.O.B. Corinto			74.00		
Exchange Rate : C\$/£	5.00			8.00	
	Offic.			Equilib.	
F.O.B. Corinto	C\$/cwt	370.00		C\$/cwt	592.00
Port services & handling			4.75		
			4.75		
Export Tariff Rate	0.00				
Export Tariff Payable			0.00		
Port Services & duties			4.75		
Wholesale price Corinto official	374.75	4.75	74.00	74.00	
Wholesale price Corinto equil.	596.75				
Market Value (Domestic Price)		4662.26			
Market Value (Internat. Price)		4785.56		7620.50	
EFFECTIVE PROTECTION RATE EQ.		0.58			
EFFECTIVE PROTECTION RATE OFF.		0.96			
DRC=(Cg-Ci)/(\$i-\$d)		4.89			

Effective Protection Rate
and
Domestic Resource Cost

Bananas

		1991			
Production Cost		Cordobas Domestic (Cd)	Cordobas Imported (\$d)	Cordobas Total Cost (Cd+\$d)	Cordobas Taxes
Land rent (1)		200.00		200.00	
Techn. & admin. services (7)		2193.75	1181.25	3375.00	
Labor (2)		10740.50		10740.50	
Interest (3)		0.00		0.00	
		13134.25	1181.25	14315.50	2.00
Materials (4)		4751.65	3069.35	7821.00	-228.84
Fertilizers (5)		0.00	0.00	0.00	0.00
Other chemicals (6)		0.00	0.00	0.00	0.00
Equipment maint. & deprec. (4)		9035.46	5874.54	14910.00	-435.15
Transport (9)		0.00	0.00	0.00	0.00
Other admin. expenses (7)		1648.45	866.55	2515.00	
		15433.56	9650.44	25084.00	-653.99
	Subtotal	23567.01	11031.69	34598.70	-663.99
Sales Cost					
Packing materials (9)		12004.00	3201.00	15205.00	-237.11
Labor (1)		2487.50		2487.50	
Transport. to Coninto (8)		1058.68	655.12	1713.80	-80.45
	Subtotal	16360.38	3856.12	20216.50	-317.56
	Total	44927.39	14887.81	59815.20	-981.55
Taxes on transport. /crate		0.00			
Yield : crates/ha		2873.00			
F.A.S. Price		97.22	87.25		
Cost per crate		15.64	5.18	20.82	
Off. exch. rate C\$/\$. \$d			5.02		
			1.04		

Source : Bananic

Notes :

- 1) Average land rent.
- 2) Average agricultural wage.
- 3) Market interest rate
- 4) Estimate : domestic content 61 per cent.
- 5) Assumption : domestic content 33 per cent.
- 6) Assumption : domestic content 33 per cent.
- 7) Assumption : domestic content 65 per cent.
- 8) Assumption : domestic content 62 per cent.
- 9) Assumption : domestic content 80 per cent.

1991

Bananas	C\$/crate (Ci)	US\$/cr. (\$i)
U.S. Gulf Price (F.O.B.)		19
Ocean Freight & Insurance		1.22
C.I.F. Corinto		17.78
Exchange Rate: C\$/\$	5.00	5
	Offic. C\$/crate	Equilib. C\$/crate
C.I.F. Corinto	88.90	142.24
Port Services & Handling		1.65
		1.65
Export Tariff Rate	0.00	
Export Tariff Payable		0.00
Port Services & duties		1.65
Wholesale price Corinto official	50.55	1.65 17.78 17.78
Wholesale price Corinto equil.	143.89	
Market Value (Domestic Price)	250589.25	
Market Value (Internat. Price)	250149.70	413395.52
EFFECTIVE PROTECTION RATE EQ.		0.50
EFFECTIVE PROTECTION RATE OFF.		0.96
DRC=(Cd-Ci)/(\$i-#d)		0.04

Effective Protection Rate
and
Domestic Resource Cost

Coffee (plantations using tractors)

Production Cost	1991			
	Cordobas Domestic (Cd)	Cordobas Imported (\$d)	Cordobas Total Cost (Cd+\$d)	Cordobas Taxes
Land rent (1) .	200.00		200.00	
Techn. & admin. services (2)	101.41	54.61	156.02	
Labor (3)	2484.54		2484.54	
Interest on work. cap. (4)	370.45		370.45	
	3156.40	54.61	3211.01	0.00
Fertilizers (5)	408.52	829.42	1237.94	-61.44
Other chemicals (6)	426.64	870.26	1296.90	-64.46
Equipment depreciation (7)	52.38	53.13	105.51	-3.94
Transport. expense (8)	144.82	88.76	233.58	-10.90
Fuels & lubricants (9)	57.10	57.10	114.2	-25.33
Other inputs	3.38		3.38	
	1109.83	1898.62	3008.51	-155.12
Subtotal	4266.24	1953.23	6219.52	-165.12
Sales Cost				
Processing expense (7)	608.46	327.63	936.10	-24.27
Export quality bags (10)	24.41	6.10	30.51	-0.45
Marketing taxes	124.39		124.39	-124.39
Transport. to Corinto (8)	64.73	39.68	104.41	-4.87
Subtotal	822.00	373.41	1195.41	-153.98
Total	5088.23	2326.70	7414.93	-320.10
Taxes on transport /cwt	5.37			
Yield : cwt per mz	22.00			
F.A.S. Price	426.56	411.93		
Cost per cwt	231.28	105.76	337.04	
Official exchange rate C\$/s		5.00		
\$d		21.15		

Source : Comision Nacional del Cafe

Notes :

- 1) Average land rent.
- 2) Assumption : domestic content 65 per cent.
- 3) Average agricultural wage.
- 4) Market interest rate.
- 5) Assumption : domestic content 33 per cent.
- 6) Assumption : domestic content 33 per cent.
- 7) Estimate : domestic content 54 per cent.
- 8) Estimate : domestic content 62 per cent.
- 9) Estimate : domestic content 50 per cent.
- 10) Assumption : domestic content .80 per cent.

1991

Coffee (technified)	C\$/cwt (Ci)	US\$/cwt (\$i)
U.S. Gulf Price (C.I.F.)		84.80
Ocean Freight and Insurance		1.22
F.O.B. Corinto		82.78
Exchange Rate : C\$/s	5.00	8.20
	Offic.	Equilib.
	C\$/cwt	C\$/cwt
F.O.B. Corinto	413.90	662.24
Port services & handling	1.97	
	1.97	
Export Tariff Rate	0.20	
Export Tariff Payable	0.20	
Port Services & duties	1.97	
Wholesale price Corinto official	415.87	82.78
Wholesale price Corinto equil.	664.21	82.78
Market Value (Domestic Price)	8944.37	
Market Value (Internat. Price)	9149.14	14612.52
EFFECTIVE PROTECTION RATE EG.	0.59	
EFFECTIVE PROTECTION RATE OFF.	0.97	
DRC=(Cd-Ci)/(\$i-\$d)	3.72	

Coffee (plantations using hand labor)

1991				
Production Cost				
	Cordobas Domestic (Cd)	Cordobas Imported (\$d)	Cordobas Total Cost (Cd+\$d)	Cordobas Taxes
Land rent (1)	202.00		202.00	
Techn. & admin. services (2)	64.22	34.46	98.68	
Labor (3)	1433.42		1433.42	
Interest on work. cap. (4)	171.10		171.10	
	1868.52	34.46	1902.98	0.00
Fertilizers (5)	253.97	515.63	769.60	-38.19
Other chemicals (6)	59.57	120.96	180.53	-8.96
Equipment depreciation (7)	62.37	53.13	115.50	-3.94
Transport. expense (8)	109.92	67.37	177.29	-8.27
Fuels & lubricants (9)	25.45	25.45	50.89	-11.31
Other inputs	5.05		5.05	
	516.33	782.53	1298.86	-70.67
Subtotal	2384.85	816.99	3201.84	-70.67
Sales Cost				
Processing expense (7)	275.72	234.08	510.60	-17.40
Export quality bags (10)	11.15	2.79	13.94	-0.21
Marketing taxes	64.04		64.04	-24.04
Transport. to Corinto (8)	29.76	18.24	48.00	-2.24
Subtotal	380.67	255.90	636.58	-83.88
Total	2765.52	1072.90	3838.42	-154.55
Taxes on transport /cwt	2.93			
Yield : cwt per mz	12.00			
F.A.S. Price	409.00	411.93		
Cost per cwt	230.46	89.41	319.87	
Official exchange rate C\$/S		5.00		
sd		17.88		

Source : Comision Nacional del Cafe

Notes :

- 1) Average land rent.
- 2) Assumption : domestic content 65 per cent.
- 3) Average agricultural wage.
- 4) Market interest rate.
- 5) Assumption : domestic content 33 per cent.
- 6) Assumption : domestic content 33 per cent.
- 7) Estimate : domestic content 54 per cent.
- 8) Estimate : domestic content 62 per cent.
- 9) Estimate : domestic content 50 per cent.
- 10) Assumption : domestic content 80 per cent.

1991

Coffee (plantations using hand labor)		C\$/cwt (Ci)	US\$/cwt (C1)
U.S. Gulf Price (C.I.F.)			94
Ocean Freight and Insurance			1.22
F.O.B. Corinto			82.78
Exchange Rate : C\$/S	5.20		3
	Offic.		Equilib.
	C\$/cwt		C\$/cwt
F.O.B. Corinto	413.90		662.24
Port services & handling		1.97	
		1.97	
Export Tariff Rate	0.00		
Export Tariff Payable		0.00	
Port Services & duties		1.97	
Wholesale price Corinto official		415.97	1.97 82.78 82.78
Wholesale price Corinto equil.		664.21	
Market Value (Domestic Price)		4908.01	
Market Value (Internat. Price)		4998.44	7970.52
EFFECTIVE PROTECTION RATE EQ.		0.60	
EFFECTIVE PROTECTION RATE OFF.		0.96	
DRC=(C0-C1)/(C1-ED)		3.52	

Effective Protection Rate
and
Domestic Resource Cost

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Coffee (plots, using hand labo

	1991			
Production Cost				
	Cordobas Domestic (Cd)	Cordobas Imported (\$d)	Cordobas Total Cost (Cd+\$d)	Cordobas Taxes
Land rent (1)	200.00		200.00	
Techn. & admin. services (2)	30.50	16.42	46.92	
Labor (3)	659.69		659.69	
Interest on work. cap. (4)	46.55		46.55	
	936.74	16.42	953.16	0.00
Fertilizers (5)	0.00	0.00	0.00	0.00
Other chemicals (6)	13.98	29.37	42.35	-2.18
Equipment depreciation (7)	8.11	2.91	15.02	-0.51
Transport. expense (8)	43.75	26.32	70.57	-3.29
Fuels & lubricants (9)	0.00	0.00	0	0.00
Other inputs	2.44		2.44	
	69.28	62.10	130.38	-5.91
Subtotal	1205.02	78.52	1283.54	-5.91
Sales Cost				
Processing expense (7)	138.29	74.46	212.75	-5.52
Export quality bags (10)	5.57	1.39	6.96	-2.12
Marketing taxes	21.57		21.57	-21.57
Transport. to Corinto (8)	14.73	9.03	23.75	-1.11
Subtotal	180.16	84.88	265.03	-28.42
Total	1385.18	163.40	1548.57	-34.33
Taxes on transport /cwt	1.77			
Yield : cwt per mz	5.00			
F.A.S. Price	410.16	411.93		
Cost per cwt	237.05	32.68	269.73	
Official exchange rate C\$/ \$d		5.00		
		6.54		

=====
Source : Comision Nacional del Cafe

Notes :

- 1) Average land rent.
- 2) Assumption : domestic content 65 per cent.
- 3) Average agricultural wage.
- 4) Market interest rate.
- 5) Assumption : domestic content 33 per cent.
- 6) Assumption : domestic content 33 per cent.
- 7) Estimate : domestic content 54 per cent.
- 8) Estimate : domestic content 62 per cent.
- 9) Estimate : domestic content 50 per cent.
- 10) Assumption : domestic content 80 per cent.

1991

Coffee (plots, using hand labor)	C\$/cwt (Ci)	US\$/cwt (\$i)
U.S. Gulf Price (C.I.F.)		84
Ocean Freight and Insurance		1.22
F.O.B. Corinto		82.78
Exchange Rate : C\$/\$	5.00	3
	Offic.	Equilib.
	C\$/cwt	C\$/cwt
F.O.B. Corinto	413.90	662.24
Port services & handling	1.97	
	1.97	
Export Tariff Rate	0.00	
Export Tariff Payable	0.00	
Port Services & duties	1.97	
Wholesale price Corinto official	415.87	1.97 82.78 82.78
Wholesale price Corinto equil.	664.21	
Market Value (Domestic Price)	2050.02	
Market Value (Internat. Price)	2079.35	3321.05
EFFECTIVE PROTECTION RATE EQ.	0.52	
EFFECTIVE PROTECTION RATE OFF.	2.99	
DRC=(Cd-Ci)/(\$i-td)	0.62	
DRC=(Qd-Qi)/(\$i-sd)	0.99	
	3.08	

1991			
Cafe tecnificado	C\$/qq (Ci)	US\$/qq (\$i)	
Gulf Price (F.O.B)		84	
Transportation		1.22	
Puesto en muelle Corinto		82.78	
Exch. Rate : C\$/\$	5.02		8
	Offic.		Equilib.
	C\$/qq		C\$/qq
Puesto en muelle Corinto	413.90		662.24
Port Svcs & hdng	1.97		
		1.97	
Duties and Tariffs	0.00		
Import tariffs		0.00	
Port. Services & duties		1.97	
Wholesale pri. Managua off=	415.87	1.97	82.78
Wholesale pri. Managua Eq=	654.21		82.78
Gross Revenue (Dom. Prc)	3987.71		
Gross Revenue (Int. Prc)	5149.14		14612.52
NOMINAL PROTECT. RATE EQ.	0.52		
NOMINAL PROTECT. RATE OFF.	0.98		
EFFECTIVE PROTECTION RATE EQ.	0.60		
EFFECTIVE PROTECTION RATE OFF.	0.98		
DRC=(Qd-Qi)/(\$i-\$d)		3.63	

Effective Protection Rate
and
Domestic Resource Cost

Cafe tecnificado : finca modelo con maquinaria

1991

Production Cost

	Cordobas Domestic (Cd)	Cordobas Imported (\$d)	Cordobas Total Cos (Cd+\$d)	Cordobas Taxes
Rent (1)	200.00		200.00	
Serv. (tecnico y admin.)	101.413	54.607	156.02	
Labor (pre-corte y corte)	2484.54		2484.54	
Interest (3)	370.45		370.45	
	3156.40	54.61	3211.01	0.00
Seed (4)	0.00		0.00	0.00
Fertilizers (5)	408.52	629.42	1237.94	-61.44
Other chemicals (6)	428.64	870.26	1298.90	-64.46
Deprec. y repos. equipo (62.38	53.13	115.51	-3.94
Transporte (10)	144.82	90.76	233.58	-10.90
Combust. y lubric. (8)	57.10	57.10	114.2	-25.38
Otros insumos	8.38		8.38	
	1109.83	1059.68	3008.51	-140.74
Subtotal	4266.24	1950.28	6219.52	-140.74
Sales Cost				
Proces. industrial (7)	608.47	327.64	936.10	
Sacos de exportacion (9)	24.41	6.10	30.51	
Marketing taxes				-124.390
Transport. to Corinto (11)	64.73	39.58	104.41	-4.87
Subtotal	697.61	373.41	1071.02	-129.26
Total	4963.84	2326.70	7290.54	-270.00
Taxes to transport. /qq	5.37			
yield: qq	22.00			
Price (puesto en muelle)	408.53	413.90		
Cost/qq seco y limpio	225.63	105.75	331.39	
Off. exch. rate C\$/s.		5.30		
\$d Imported compon. of prod. cost		21.15		

Source: Comision Nacional del Algodon

ites:

Average rent charged in the area according to the kind of crop.
Average wage prevalent in the agricultural sector.
Actually credit is mainly imported.
Seed is assumed to be locally produced.
We assume 33% domestic content and 67% imported components.
We assume 25% domestic content and 75 % imported components.

- 7) We assume 30% domestic content and 70% imported component.
- 8) We assume 50 % domestic content and 50 % imported component.
- 9) We assume 65 % domestic content and 35 % imported component.
- 10) Transporte de insumos, cortadores y del producto hasta el beneficio.
We assume 62% domestic content and 38 % imported components.
- 11) We assume 62% domestic content and 38 % imported components.