A GENERAL FRAMEWORK FOR EVALUATION OF CNP'S GRAIN PRICE POLICIES IN COSTA RICA

By

Carlos F. Cervantes

Thesis Plan B Paper
For Partial Fulfillment
of the Requirements of

MASTER OF SCIENCE

Department of Agricultural Economics
Michigan State University

1975

ACKNOWLEDGMENTS

I wish to express my appreciation to Dr. John N. Ferris for his support, excellent guidance and supervision in the development of this study. Appreciation is also due to Dr. Harold M. Riley for his valuable comments and suggestions that made possible considerable improvement over initial drafts.

Special recognition is given to Michael T. Weber for his encouragement and help. Many additions and corrections which appear in the final draft were due thanks to his time and effort in helping the author in the preparation of the paper. Thanks are also due to Ms. Sandra Clark for her assistance in typing the final draft.

Finally, I am indebted to my wife, Elizabeth, not only for typing early drafts but for her understanding and encouragement.

TABLE OF CONTENTS

		Page
LIST OF ILLUSTRATIONS		v
LIST OF TABLES		vi
CHAPTER		
I	INTRODUCTION	1
	1.1 General Problem	1
	1.2 Orientation and Objectives of the Study	2
	1.3 Organization of the Paper	3
II	ROLE OF AGRICULTURAL PRICE POLICY IN DEVELOPING COUNTRIES	5
	2.1 Government Intervention in Agricultural Markets	5
	2.1.1 Nature of Price Variations	5
	2.1.2 Economic Problems Associated with Agricultural Price Fluctuations	7
	2.2 Objectives of Agricultural Price Policies	9
	2.3 Price Policies and Economic Development	12
	2.4 Price Policies and Consumers	20
	2.5 Price Policies and Marketing Functions	22
III	A CONCEPTUAL FRAMEWORK FOR STUDY AND EVALUATION OF AGRICULTURAL PRICE POLICIES	28
	3.1 Purposes of Policy Evaluation	28
	3.2 General Orientation	30
	3.3 Characteristics and Problems of Analysis	31
	3.4 Performance Norms or Criteria for Evaluation	35
	3.5 An Action System Model to Relate Elements of Policy Formulation	38
	3.6 Summary of Performance Tests	44

LIST OF ILLUSTRATIONS

FIGURE		Page
2.1	Simple Analytics of the Operation of a Buffer Stock Scheme	24
3.1	Principal Components Involved in a Commodity Subsector Study	32
3.2	Main Elements of an Action System	39
4.1	Estimated Major Market Channels for Corn Production and Marketing in Costa Rica . . .	57
4.2	Costa Rica: CNP Corn Prices and Production 1949/50 to 1974/75	71
4.3	Costa Rica: Average Consumer Prices in the Metropolitan Area for Corn 1962-1973 . . .	86

LIST OF TABLES

TABLE		Page
4.1	Costa Rica. Corn: Number of Farms, Area Planted, Production, Farm Consumption, Yield per Hectare, and Average Area Planted Per Farm	59
4.2	Costa Rica. Corn: Some Production Variables	61
4.3	Costa Rica. Storage of Corn (in quintales)	67
4.4	Costa Rica. Corn: Support Prices, Production and Trade (colones and quintales)	70
4.5	Costa Rica. Census Data of Area Planted for Some Agricultural Commodities (Hectares)	73
4.6	Central America. Corn Support Prices and Transportation Costs, 1969-70 ($/ton)	74
4.7	Central America. Some Price Differentials for Corn, 1969-70 ($/ton)	75
4.8	Costa Rica. Percentage of Domestic Production Bought by CNP	77
4.9	Costa Rica. Corn: Import Prices and CNP Support Prices (in colones per quintal)	78
4.10	Costa Rica: Average Consumer Prices in the Metropolitan Area for Corn 1962-1973 (Colones per pound)	85

CHAPTER I

INTRODUCTION

1.1 General Problem.

Among the different institutions through which the Costa Rican Government influences production and internal marketing of agricultural commodities, the Consejo Nacional de Producción (CNP) is the most important one. It was established in November 1943 as a section in the Banco Nacional de Costa Rica, to supersede the Junta de Abastos which was intervening in the marketing of grains since 1932. Later in 1948 CNP was founded as an autonomous institution.

The Consejo is given by law a great deal of authority in fomenting production and stabilizing prices of food products. It is also entitled to perform a wide range of activities and marketing functions affecting the food system (buying and selling, assembling, transporting, storing and processing, importing and exporting, price fixing, input distribution, etc.). Because of the strategic role of agriculture in the country, and due to very significant influence of the Consejo's intervention upon production, marketing and consumption in particular, as well as rural and economic development in general its

decisions have a lot of important economic and political consequences[1].

In spite of all of these facts the Consejo's policies have not yet been comprehensive and systematically evaluated[2]. Nor have the benefits and costs of current programs upon society been explicitly considered. Likewise, little attention has been paid to alternative types of programs and procedures that would permit goals to be achieved as efficiently as possible under changing and dynamic conditions.

1.2 Orientation and Objectives of the Study.

In the case of a developing country like Costa Rica, where public capital resources are particularly scarce it seems especially important that any governmental program that involves substantial expenditures be periodically evaluated. Such a task is beyond the scope of this paper. Instead, our main purpose is to develop a general framework for appraising the actions and effects of the policies and programs of the Consejo Nacional de Producción. In order to be more specific about the framework's orientation

---

[1] An outline description about the role and overall functions of the Consejo Nacional de Producción is presented at the beginning of Chapter IV.

[2] Some research studies done so far have analyzed some aspects of CNP's intervention, but they have not dealt with explicit evaluation of costs and benefits of the programs. See for example: [Consultores . . . et al. 2 and 3], [Econométrica 6] and [González, et al. 11].

and techniques, some relevant issues of CNP's corn program operation are examined in a later chapter. The reason for narrowing down the topic to such a particular commodity is basically due to time and resource limitations, and data constraints in the elaboration of this paper. Hopefully this will provide a more practical guidance in dealing with specific evaluation issues. Thus, the objectives of this study can be summarized as follows:

1) To review existing literature in order to present, in a general perspective, the role of agriculture price policy in the context of developing countries.

2) To set forth a conceptual framework to evaluate effects and consequences of agricultural price policies.

3) To present an overview and general analysis of CNP's corn program. This includes an identification (to the extent available data permit) of economic effects of CNP's corn price policy, and suggestions for further analysis required to appraise the full impact of the program.

1.3 Organization of the Paper

To achieve the objectives of the paper, the written material is organized in the following way:

Chapter II discusses in general and theoretical terms the role and contribution of agricultural price policy to the process of economic development. Emphasis is placed on the situation of developing countries with problems of insufficient internal production to satisfy their consumption demands. Main problems that give rise to government intervention in agriculture and objectives of price policies are identified.

Chapter III develops a conceptual framework as a guide for assessing direct and indirect effects of price policies. This includes the identification of norms of performance, exposition of procedures for carrying out the evaluation process, and the presentation of an action system model or general paradigm to relate various elements of policy formulation.

Chapter IV is an exposition of important issues about the Consejo Nacional de Producción's corn program, which we deemed pertinent for purposes of a recommended evaluation effort of the agency's programs and policies. At the beginning a description of the elements of the corn action model and an overview of the corn subsector structure model is provided. Then available agricultural and corn data is discussed. Finally selected aspects of the CNP's corn program are analyzed, identifying areas of research and suggesting some analytical techniques to deal with evaluation problems.

CHAPTER II

ROLE OF AGRICULTURAL PRICE POLICY IN DEVELOPING COUNTRIES

2.1 Government Intervention in Agricultural Markets.

2.1.1 Nature of Price Variations.

It is well known that farm prices tend to fluctuate more frequently and more widely than prices of many non-farm goods and services, particularly in the short run. Several factors, some of them inherent to the particular nature of agriculture, are responsible for the sharp and on occasions violent fluctuations of agricultural prices. The most important among these are time lags in production response, supply and demand elasticities for agricultural commodities, instability of supply and demand, and the influence of natural factors [Tomek 29, Cochrane 1, Shepherd 26].[1]

In fact, farm production cannot respond to change in demand as quickly and spontaneously as industrial production. The length of the production period and the seasonal nature

[1]While there are other economic forces that effect the level and variations of agricultural prices like income, population, tastes and habits, and the tempo of the development process, these are not exclusive variables in agricultural price behavior.

of agricultural production causes maladjustments between production and demand to persist for different time periods before they can be rectified by an appropriate change in production.

The nature of the aggregate supply and demand curves tends to be more price inelastic for agricultural commodities than for many industrial products. On the supply side, in addition to production lags, immobility of factors of production and perishability of many agricultural products result in inflexibility of output in relation to price changes. On the demand side there is often low increase in consumption resulting from falls in price. Under these conditions, small variations in supply and demand cause great variations in agricultural prices.

Instability in agricultural supply arises because of the biological nature of agricultural production which leads to unplanned yearly fluctuations and a concentration of output into certain seasons. Added to this, unpredictable changes in production take place as a result of the influence of natural factors like weather and pests. There is a large stochastic element associated with these factors in any given crop year.

Instability in demand for food and other agricultural commodities as a consequence of prosperity and depression, war and peace are very disturbing. Also instability in international commodity markets and export demand affects strongly prices of many agricultural products.

Other factors like widespread geographical dispersion, and the unpredictable rates of development of new production technologies make it very difficult to coordinate and maintain equality between the rates of growth in aggregate supply and demand in agriculture. As a result of all of these factors strong price changes are generated.

2.1.2 Economic Problems Associated with Agricultural Price Fluctuations.

There are two basic kinds of economic problems associated with price variability in agriculture which generally give rise to state interventions: a farmer income problem and a price and production uncertainty problem [Cochrane 1, Ch. 2; Johnson 16, Ch. 1]. The income problem can be broken down in two sets of issues: 1) fluctuating incomes, and 2) distribution of income within and outside the agricultural sector.

Fluctuating incomes result largely from fluctuating prices but fluctuations in prices do not necessarily lead to fluctuations in incomes. Indeed, the price change can be offset by a change in costs or in the quantity sold. This is why stabilization of incomes does not necessarily mean stabilization of prices; when prices vary because of variations in output, stabilizing prices would unstabilize incomes. The income distribution problem, especially disparity between agriculture and other occupations, ". . . is essentially the result of the industry not being able to

adjust itself quickly enough to changed conditions. As incomes rise, the demand for food does not rise proportionally, whereas technical progress--at least in developed countries--causes a continuous rise in output. Fewer farmers are therefore needed to produce the food required but, because of various frictions, the reduction of the number of farmers does not take place at the required speed, leading to over-supplied markets, low prices, inadequate output per man, and low incomes. The solution must ultimately, therefore, lie in structural reform, even though price support may legitimately be employed to bolster incomes in the short run." [Hallet 12, p. 15].

The other general problem, uncertainty, is associated with randomness and has implications for resource use and farm business planning. "A commodity price may rise one year and fall the next, may rise for two years and fall for one, may rise for one and fall for two; the combinations are not infinite in number, but they are many and they are random. To the farmer next year's price is uncertain. He does not know with any reasonable degree of probability whether the price of a particular commodity will be up or down next year, or by how much. Thus he plans for next year's production pretty much in the dark--on a guess here and a hunch there." [Cochrane 1, p. 19].

This condition of price uncertainty is usually large in most commodities, and it leads to inefficient distribution of resources through time and among commodities. It

leads to something less than the goal of maximum satisfaction to society from the use of a given amount of resources.

The two problems briefly outlined here are not transitory phenomena; they are the logical and continuing consequence of chronic price instability in agriculture [Cochrane 1, p. 30], and they motivate government action.

In this paper we are concerned with agricultural price policy which is not only confined to the problems of agriculture's welfare but to the problems of society's welfare. Outside of the farm sector other important issues motivate government intervention like consumers price uncertainty which attempts to benefit consumers by assuring a steady flow of the product into market outlets at the desired time. But this leads us to the general objectives of agricultural price policy in the next section.

2.2 Objectives of Agricultural Price Policies.

According with the theory of public policy the basic purpose of public policies is presumed to be the improvement of society's welfare. They are designed to improve the conditions under which people act and live. The goal of policies is governed by what people desire, and the measures of policies, by what people think the government can and ought to do to bring about the desired changes [Sch ickele 23, Ch. 4].[1]

[1]Of course,it is first essential to know what "people" we are talking about. This involves political and economic power dimensions.

Among public policies agricultural price policy is concerned with the prices which the farmer receives for his products and the prices at other stages in the distributive chain (processing, assembling, wholesaling and retailing). It involves consideration of the level of agricultural prices relative to the general price level, agricultural prices relative to consumption goods and inputs purchased by farmers from industry, and the prices of agricultural prices relative to each other. A complete policy would take all of these relationships into account [Fletcher 8][1].

Having briefly defined what is understood by price policies, there are at least eight most frequently proclaimed objectives of price policies:

1) to reduce price and income instability.
2) to provide "fair" prices for farmers.
3) to accelerate the growth of agricultural output as a whole.
4) to encourage or discourage production of particular commodities.
5) to provide "fair" prices for consumers.
6) to reduce imports and/or increase exports of

---

[1]When agricultural price policy refers to inputs it is concerned not only with the price of internally produced inputs but with the price of imported ones. Thus, government regulations affecting interest rates for agricultural credit, import duties on fertilizer and machinery would be classified as agricultural price policies in this paper.

food and fiber.

7) to encourage the introduction of new technology.

8) to provide processors and other marketing agents with a "fair" return on their investments.

Given the conflicting nature of these objectives, there is probably no price structure that can guarantee the simultaneous attainment of all of them.[1] In practice price policies would have to be evaluated on the basis of weights attached to those alternative objectives. Those weights are politically determined, and the policy decisions are inevitably influenced by political pressures and social considerations. Economists can however still play a useful role by pointing out which groups in society are likely to gain or lose if a particular policy is adopted.

In developing countries, given very limited financial resources and conflicting interests, in some circumstances it may be possible to make progress toward only a few of the objectives. Priorities must be established and trade-offs made between major objectives and various alternatives for achieving them.

---

[1]Obviously all the policy goals listed above are not mutually exclusive. Some of the goals are complementary; others tend to be in conflict. The interdependence of the goals is one of the factors that makes it difficult to objectively judge particular price policies.

2.3 Price Policies and Economic Development.

The emphasis placed on objectives and techniques of price policies should be radically different in different parts of the world because the context of agricultural development differs widely. Since all possible situations cannot be discussed adequately in a single paper, the discussion that follows is focused mainly on developing countries with problems of insufficient internal production to satisfy their consumption demands. In that context, price policies should be harmonized with the goals of economic development in general and agricultural development in particular.

Many theoretical essays regarding the relationship between the agricultural sector and economic growth emphasize the role of various "surpluses" which agriculture can provide to support development in the urban industrial sectors. At some time during the development process the flow of investment resources must be oriented mainly toward the industrial sector to produce the consumer and capital goods in demand by economic development, creating at the same time the non-agricultural employment

possibilities that the growing population requires.[1]

This may suggest that food and raw materials coming from agriculture should be priced at relatively low levels facilitating capital formation in the industrial sectors. Having rising prices for food would increase wages and reduce profits, thereby limiting capital formation, the rate of growth of non-farm output, and the increase in urban employment [Ranis and Fei in 7, #10].[2] Moreover,

---

[1] "Theoretically, a country could specialize in agricultural production by raising the sector's productivity through large investments and the incorporation of technology, as well as through interchanging its agricultural products for the needed inputs and manufactured goods via foreign trade. This argument, which rests on the comparative advantages of certain agricultural countries, has often been advanced in Latin America. Nevertheless, and discarding pro tem the drawbacks that such a high degree of dependence on the exterior would entail, it is evident that a country would never attain economic development in this way. The reason is that a highly productive agriculture could in no case absorb more than a fraction of the labor force, and, therefore, a country could never reach a high level of adequately distributed income unless alternative (industrial) occupational opportunities were created to absorb this labor surplus productively." [Echeverría 5, p. 14]. Although we agree with the general thrust of this argument, agriculture still can absorb more of the labor force increasing the sector's productivity through careful design and adoption of appropriate technological improvements. About this see for example Yujiro Hayami and Vernon W. Ruttan, "Agricultural Development: An International Perspective" (Baltimore: The John Hopkins Press, 1971), Part III.

[2] Low prices for agriculture and redistribution from the agricultural sector to the industrial sector tell us nothing however, unless we know whether or not these better relative prices have benefitted the industrial producers (who could invest their increased profits as the economic development theorists suggest), have been passed on to the urban consumers, or have been channeled to the government or to the rest of the world. It seems that the biggest issue in economic development is not how to achieve development, but development for whom.

as many agricultural products are factors in the cost of production of processing and marketing firms, rising farm prices may adversely affect its growth depending on the elasticity of demand for the final product.

For another matter, if domestic agriculture is going to contribute in the necessary expansion for rapid growth in non-agricultural sectors, agricultural output has to grow at a greater rate than the increase in demand associated with population and per capita income growth. In most developing countries where agriculture plays a dominant role in income generation, foreign exchange earnings and employment, there is a certain rate of growth required for a given rate of growth in a development plan. Such a rate is normally quite high if development is going to take place at a rapid and sustained pace.

For agriculture to play such a role, increased productivity and income per person are necessary conditions in the sector. An important implication of this view is the searching for cost-reducing, productivity-increasing sources of output growth complementary to existing labor-land resources [Fletcher 8]. However, if farming in general is not profitable at the prevailing prices, the agricultural sector can be expected to stagnate. No amount of credit, infrastructure, modern inputs, or irrigation will generate

the desired result if their use "doesn't pay" [Thompson 28].[1]

The available empirical evidence suggests that farmers in developing countries have been shown to be responsive to changes in relative prices of alternative crops. They also have been shown to adopt and use new practices and inputs that offer sufficiently attractive and certain rewards but to be reluctant to innovate when potential rewards seem uncertain and/or unattractive [Fletcher 8].

[Krishna 17] brings significant information on the historical development of price policies in developing countries, and shows how in country after country planners have launched development programs with depressed terms of trade for the agricultural sector, agricultural output has failed to grow at the required rate, and planners have felt compelled, willy-nilly, to turn to policies favoring agricultural terms of trade.

Another important issue that should be considered here is the high rate of population growth and rural-urban

---

[1] Indeed, transformation in traditional agriculture cannot be brought about only or mainly by price manipulation. Price policies are only one of several incentive elements affecting agricultural and economic development; incentives in turn are only one of other basic factors affecting development like technology, infrastructure, resource availability, education, population growth, government policies, etc. This implies that price policies need to be considered, within the complete set of economic and social policies in a specific country. All that we are suggesting here is that incentives are a powerful ingredient to be considered in designing agricultural development policies. Price movements can either accelerate, retard, or arrest output growth through incentive motivation.

migration and the apparent failure of industrial employment in absorbing the labor force moving into urban centers.[1] Exploitative extraction of agricultural output, by encouraging urban migration and discouraging production, can aggravate problems of both employment and food supplies in the cities [Krishna 17].

On the basis of those arguments it can be considered that profitability is a critical factor for agriculture to be a dynamic force in development. Under these circumstances price policies may be used in two different but complementary ways: supporting prices which provide incentives for output growth, and fomenting the adoption of technological innovations through input subsidization.

While a rise in agricultural prices may foster increase in production as well as increased savings and investments in the agricultural sector, it may however be discouraging to industrial investment. In addition, the benefits of relatively high agricultural prices will probably accrue to high-income producers mainly from low-income consumers as those spend a higher proportion of their incomes in food. The higher prices benefit farmers in proportion to each farmer's marketed output. Small farmers who sell little, benefit little. "Also, a price

---

[1]For an excellent exposition of these problems at least in Latin American countries see William C. Thiesenhusen, "Population Growth and Agricultural Employment in Latin America with some U.S. Comparisons," American Journal of Agricultural Economics, Vol. 51, November 1969, pp. 735-752.

support program, if successful in raising commodity prices significantly above free market non-program levels, tends to be capitalized into the values of the land. Thus, the benefits of the support programs tend to be distributed to land owners in proportion to the original value of their land adapted to the production of supported commodities."[1] Obviously all of this is in opposition to the concepts of equity held by most modern governments.[2] It is also argued that if farm prices are raised peasants may or may not take to improved cultivation. They may simply spend the extra income on consumption, and ouput growth objective might not be reached. Because of these conflicting influences it seems to be that the objective of price policies through direct price manipulation should be primarily directed to price stabilization to reduce risk and uncertainty.

Input subsidization can be used to avoid negative effects of price support programs.[3] It avoids rising food and raw materials prices against the growing industrial

---

[1]Latin American Market Planning Center, Fomenting Improvements in Food Marketing in Costa Rica, Research Report No. 10, Latin American Studies Center, Michigan State University, 1972, pp. 67-68.

[2]An attempt to cope with the effects of maldistribution on income from price supports in Mexican agriculture is the use of differentiated support prices. Thus government price for wheat and corn is less in irrigated than in non-irrigated areas. (Foreign Economic Development Service 10, p.31).

[3]The major traditional purpose of input subsidies in developing countries has been to encourage farmers to use new technologies mainly fertilizers to expand total production. See Dana G. Dalrymple, Evaluating Fertilizer Subsidies in Developing Countries, AID Discussion Paper No. 30, Washington, D.C., July 1975.

sector.[1] As the benefits of the government expenditures are provided in proportion to total production and used inputs, lower-income producers whose consumption of own farm produced commodities is normally high benefit in proportion to total output, not upon marketed output.

Nevertheless, there are at least two conditions that must be met for an input subsidization program to succeed [Krishna 17]. For one thing the use of subsidized inputs have to be familiar to the peasants or they are not likely to be very sensitive to changes in their prices, and subsidized inputs should represent a high proportion of production costs if the program is going to bring the desired results. It is doubtful at the present time that such conditions are obtained in most developing countries so as to make input subsidies a complete substitute for product price guarantees. Input subsidies cannot be used for controlling downward product price fluctuations. Furthermore, they cannot be used to induce changes in production of particular commodities as direct price intervention does.

The above considerations suggest the need for utilization of both price supports and price subsidies as complementary instruments of policy. The emphasis placed in the application of each instrument depends on the

---

[1] In the long run, however, the cost of the financing the program may exert inflationary pressures in the industrial sector via higher taxes.

particular conditions in every country.

One additional issue we want to comment on is related with the alternative for a country engaging in international trade of agricultural products. Price supports means, in some cases, that the level of internal production will be maintained at a higher level than would otherwise be the case. This is contrary to the free trade doctrine, based on the theory of comparative costs, that a country should concentrate on the production of those things it produces relatively cheaply and import those which it produces relatively expensively. But even apart from the "strategic" reasons why countries may be willing to sacrifice some of the advantages of international specialization, there are other reasons why countries may not wish to allow complete free trade in agricultural products. For instance, as modern welfare economics has stressed, any conclusions on whether a country is better or worse off under one economic policy or another cannot ignore the distribution of incomes. This is not to say that agriculture can, or should, be given complete protection from the effects of economic change or overseas competition. It is economic pressure which generally brings about structural change; economic pressure may thus be needed to initiate the agricultural adjustment which in the long run is the only solution to low farm incomes. But even if the aim is to achieve structural change, so as to make support unnecessary, agriculture may still

require support for the transitional period, like other "problem" industries. The peculiarity of agriculture is that structural changes take an exceptionally long time, often a generation or more. Thus the distinction between transitional and permanent support is not always clear-cut [Hallet 12, Chapter 10].

2.4 Price Policies and Consumers.

The conflicting issue of balancing farmer versus consumer interests has been touched upon in the last section about price policies and economic development. There are, however, some general considerations about agricultural price policies related to consumer welfare that deserve special mention. In fact, in developing countries the objective of "fair" consumer prices is usually regarded to be more important than that of "fair" farm prices.

Low prices for consumers, particularly food prices, are very important for the large number of poor people in low-income countries where a high proportion of their income is normally spent on purchasing food. Because the number who suffer from severe nutritional deficiencies is so large that such prices are a matter of immense social and political as well as economic concern.

If consumer welfare really matters, a paramount goal of agricultural price policy should be to assure a steady flow of food products into markets outlets, at the desired time and the desired amount. Expanded output is also of

vital importance in making supplies available at moderate prices. To follow the short-run view of holding down food prices for urban workers by holding down farmers' prices runs the risks of lowering farm incentives to sell more in the short run and to produce more in the long run. Those policies ceteris parabus end up in food shortages, particularly in the long run, and bring about higher prices for consumers.[1] Therefore from an overall society point of view, there is a need for a policy which limits urban food price increases without adversely affecting the growth of agricultural output. And under such a policy, the apparent opposition between farmer and consumer interests fades out and overlaps into the same general interest.

If the government seeks to give relief and help poor consumers the use of price policies is not an efficient mechanism (in the sense that food is made artificially cheap to the rich as well as to the poor) for income transfers. Income transfer to confine benefits to the poor through means other than the pricing system (food stamps, food cards, etc.) should be investigated.[2]

---

[1]Given food consumption habits, a reduction in price may not necessarily be the most efficient way of improving the nutritional levels of the most needy groups in the population.

[2]Even though in general food is much larger percentage of poor people's total expenditures than of the rich ones', a program which subsidizes food for the very low-income groups may be less costly for society particularly in the long run than indiscriminately to keep food prices low.

2.5 Price Policies and Marketing Functions.

With respect to marketing functions, agricultural price policy calls for provisions to facilitate spatial and temporal differentials. Geographic price differentials in line with regional equilibrium prices reflecting transportation costs will encourage efficient production and interregional trade patterns.

The temporal dimension is critical whenever a product comes to the market during a small part of the year and its consumption is continuous through time. This calls for appropriate storage.

A storage program requires that a government or private agency be prepared to purchase and store if prices at harvest fall significantly below the appropriate support level. When there is a tendency for private sales to move up the public marketing agency should increase its sales therefore limiting price increases. "Such contra-market behavior on the part of a public market agency is the essence of the strategy of stabilization" [Krishna 17, p. 534].

A way to implement a stabilization policy is through buffer stock operations. Because of the importance this concept carries for stabilization purposes we will briefly describe how it operates.[1]

---

[1]This argument draws upon R. D. Torres et al., A Buffer Stock Scheme for Rice and Corn in the Philippines, National Food and Agriculture Council, Philippines, March 1973.

A buffer stock scheme is basically a price-moderating plan. Let us assume that the general shape of the demand curve for the grain in question is DD' in Figure 2.1.

Let:

S_1, S_2 (also Q_1, Q_2) be the lower and upper bounds of fluctuating short-run supply curves;

P_1, P_2 indicate open-market prices (assumed to be socially undesirable for varying too widely); and

P_3, P_4 show desired range of prices under buffering operations.

The scheme operates such that an organization like a public agency must directly engage in buying and selling grain. For instance, if the price of grain falls below P_4, the public agency must buy enough quantity of grains so that price is restored to P_4. Alternatively, if the price rises beyond P_3, the agency must sell such quantity of grain as to affect a price drop back to P_3.

The choice of the range (P_3-P_4) must be governed by observed behavior of long-run magnitudes of the price of the grain in question. The range must, by no means, be fixed over long periods. Rather, it must be flexible and made to respond to major changes in the economy.

Figure 2.1 shows that the size of the permitted zone of quantity fluctuation (Q_4-Q_3) will depend on (a) the price elasticity of demand for the grain, (b) the desired

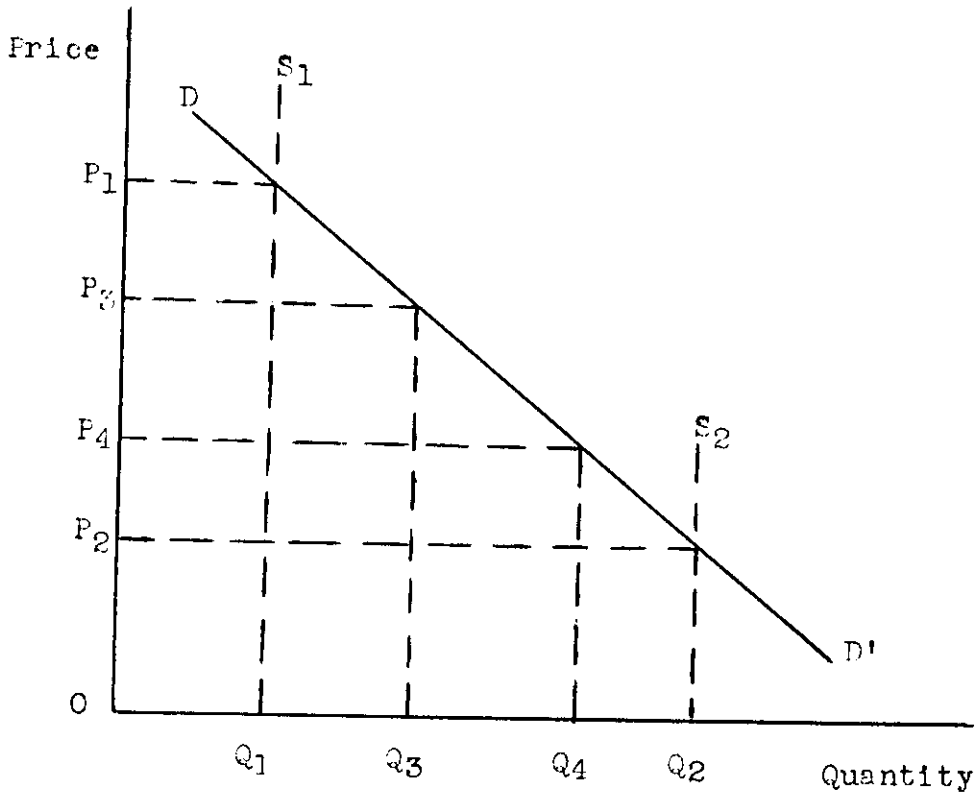


Figure 2.1. Simple analytics of the operation of a buffer stock scheme.

limits of the price range, and (c) the financial resources of the public agency. For a given quantity change a demand curve less elastic (steeper) than DD' will imply a wider price fluctuation; a more elastic (flatter) curve will allow a narrower variation in price. The buffer scheme will fail if a) the public agency runs out of funds to buy grains during months of excessive supply, or b) when the

agency runs out of grain to sell during lean months. Care should be exercised therefore not only in the choice of the price range but also in the financial management of the scheme.

The scheme, if managed successfully, can be an effective instrument in inducing increases in food output by eliminating part of the risk associated with wide price fluctuations. The scheme can also benefit consumers by assuring a steady flow of the product into market outlets at the desired time.

Nevertheless a price stabilization program which alters seasonal price rises in line with storage costs will discourage private storage. Whether storage as well as other marketing functions should be performed by private or public enterprise is a question that has to be answered on the basis of marketing efficiency.[1] There is also a question of where scarce public resources can be invested to have the maximum socially desirable impact on the food system and other segments of the society. If private and government agencies are going to coexist both types of participants must compete, without subsidies or monopolistic privileges, in rendering the cheapest and most efficient possible marketing service. In this way the cost of services supplied by the marketing system will be minimized.

---

[1] In most cases it is recognized that only a small degree of government intervention is required to exercise considerable influence on the private marketing system.

In developing countries, there is a widespread strong feeling, mainly based on conventional wisdom, that marketing margins and intermediate prices should be controlled by government because agricultural marketing is monopolistic. Also marketing functions and their utility for society are not generally understood.[1] Regarding the first assumption, it should be pointed out that in each particular case careful analysis is needed to determine whether private intermediaries are operating with unreasonable profits given conditions of risk and uncertainty, and to evaluate whether government intervention can do any better.

If on the basis of field research, monopoly is really found to exist, one policy for the government to eliminate the element of monopoly gain in the cost of marketing is to increase competition in the trade, either by operating new shops of its own or facilitating the entry of more private firms into it.

In spite of this, the generalized practice among political leaders is to prefer direct and visible forms of market intervention like enforcing wholesale and retail maximum prices and fixing marketing margins. Such policies do not remove monopoly elements where they exist and almost always end up in failure to provide price relief to consumers because they deplete and disrupt the flow of supplies to the cities [Krishna 17].

---

[1]For a detailed exposition of these problems and related issues see [Harrison et al. 13].

Given those results of programs that directly control prices and margins, it is important to consider alternative (although less politically visible) forms of intervention to improve marketing efficiency and lower costs, thus making it possible that the producer price rises and/or the consumer price falls. Public programs of training, extension, information, supervised credit and research in marketing are critical areas where the government can appropriately stimulate improved marketing performance.

Unfortunately policy-makers tend to underestimate the potential impact of indirect forms of public action on marketing performance. And they may discriminate against them since they have less political impact compared with highly visible price control programs.

CHAPTER III

A CONCEPTUAL FRAMEWORK FOR STUDY AND EVALUATION OF AGRICULTURAL PRICE POLICIES

In the last chapter we broadly discussed the role of price policies in developing countries. In the present chapter we assume given specific policies and their objectives and then we turn to the problem of how to determine their success or failure; that is, how to assess effects and consequences upon the economy. For this purpose a general framework of analysis is presented, and guidelines to organize such a task are given at the end of the chapter. The analytical approach is developed at such a level of abstraction as to allow the application of the framework, with appropriate modifications, to the analysis of other government policies and programs.

3.1 Purposes of Policy Evaluation.

Given the important implications of agricultural price policies upon production, marketing and consumption in particular as well as rural and economic development in general, the basic purpose of policy evaluation is to ascertain the performance or flow of consequences from such policies, and at the same time to determine whether the out-

comes are compatible with the general objectives of social and economic development. This evaluation will also indicate the possibility of modifying the programs and procedures through which policies are implemented, so that the results obtained by new arrangements can lead to improved performance for the overall agricultural sector and society in general.

In the case of developing countries where public capital resources are particularly scarce it seems especially important that any governmental program that involves substantial expenditures be periodically evaluated. The fact that little formal or serious evaluation analysis occurs involves the danger that the government may continue to spend its resources and perhaps even borrow resources for projects and programs that are grossly inappropriate or of little economic and social value.[1]

Depending on the particular situation, the implementation of price policies may require substantial administrative and organizational structure, high capital outlay, and certain infrastructure development. To make an optimal decision, government must consider among other things the opportunity cost of alternative policies.

To be as objective as possible in price policy

---

[1]I believe it is only through constant evaluation and reevaluation of the performance of policy institutions that institutional behavior and ultimately performance can be improved in the long run. Indeed without knowing how well one is doing it is difficult to know how to improve.

appraisal the analyst is required to determine what society is after in their price policy programs, to what extent these policies have accomplished their purposes, and in what way they might be improved. This is appropriate even if one does not accept one or more of the objectives of those policies

3.2 General Orientation.

A comprehensive evaluation requires a broad analytical framework to supply essential operational research questions and to indicate appropriate research methods. A modified structure-conduct-performance framework can be useful in organizing such an evaluation analysis, especially because it makes explicit the impact and relationship of structure and conduct to performance that we wish to study. This framework will be used as a general frame throughout this chapter.

In order to help in understanding the environment in which price policies affect the performance[1] of the agri-

---

[1] "By performance we simply mean the flow of consequences, results or outputs from a particular activity, program or organization. It is the outcome of the structure and conduct of the organization interacting with the external social and physical environment. By structure we mean the configuration of decision units making up the system under consideration. The structure describes the number and size of relevant decision units and the relationship of one decision unit to another in the system. Conduct refers to the behavior of the organization. The conduct can be described in terms of a set of decision rules, both formal and informal." James D. Shaffer and Garland P. Wood, Institutional Performance in Agricultural Development, Ag. Administration Workshop, October 26, 1971, Michigan State University, East Lansing, Michigan.

For an early exposition of the structure-conduct-performance framework, see Joe Bain, Industrial Organization (New York: John Wiley, 1959). See also F. M. Scherer, Industrial Market Structure and Economic Performance (Chicago: Rand McNally & Co., 1973).

cultural sector, we will adapt the approach of the LAMP Center[1] for commodity subsectors, defined as the entire set of activities performed in the production, assembly, processing, distribution and consumption of a single product [Harrison et al. 13, p. 56].

Although in the real world there is a complex set of relationships between the institutions involved in a commodity subsector, it is possible to summarize the main range of elements involved as shown in Figure 3.1.

This sector orientation has the advantage of showing all the different elements that are affected by a given policy. It is of prime importance for the institution charged with the design of the relevant policies to consider its effects upon the whole commodity subsector.

3.3 Characteristics and Problems of Analysis.

The evaluation process requires the definition of norms or acceptable levels of performance which can represent the objectives of policy, and the specifications of adequate performance measures which are compared with the norms. In this sense and according to H. Riley et al.,[2] evaluation is both normative and relative. It is normative

---

[1] Latin American Planning Center at Michigan State University.

[2] See Harold Riley et al., Market Coordination in the Development of the Cauca Valley Region-Colombia, Research Report No. 5, Latin American Studies Center (East Lansing, Michigan: Michigan State University, March 1970), p. 7.

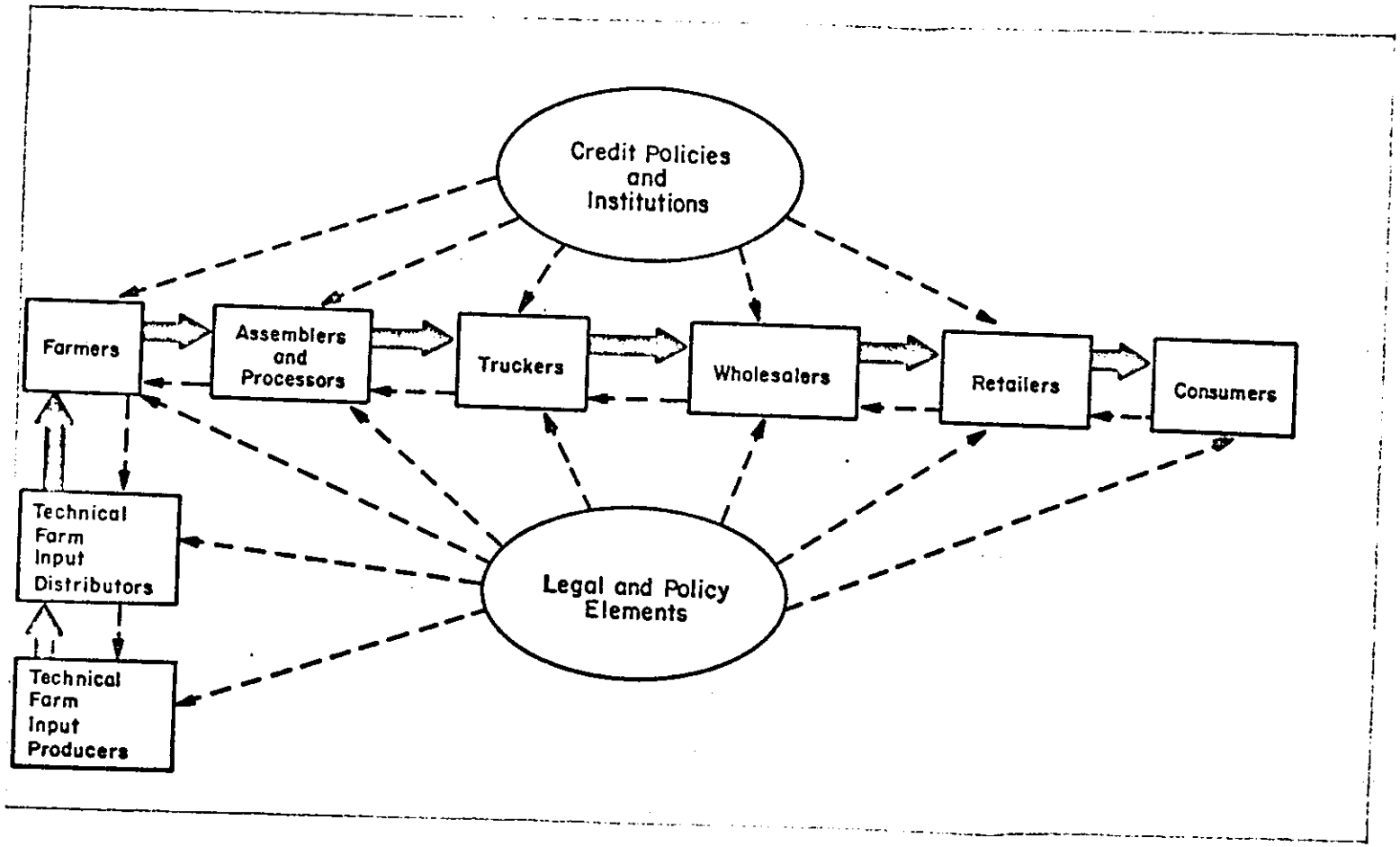


Figure 3.1 PRINCIPAL COMPONENTS INVOLVED IN A COMMODITY SUBSECTOR STUDY.

Source: Harrison, et. al. 13, p.7

in the sense that we observe how the results deviate from what seems to be desirable as expressed in the goals. The evaluation is relative in that there is no ideal condition likely to be attainable. But even further, with respect to the achievement of the ends or objectives we have to bear in mind that: "The achievement of an end in public policy is not a matter of all or nothing but of more or less. It is a matter of degree. Whether a policy is successful depends on whether the situation has improved as the result of the program" [Schickele 23, p. 61].

To tell if the new situation has improved with the program involves, of course, normative statements, and the results flowing from the policy programs must be judged against what is attainable through alternative ways of improving policies.

With respect to performance measures, there is a real problem in developing indicators that accurately reflect the characteristics or performance dimensions resulting from policy effects on behavior of firms and markets. Several performance variables cannot be measured directly, and when one decides what descriptive data are relevant, a normative judgment is already made. In addition, perhaps one of the most serious difficulties in this area is that we can never know what the exact situation would

have been without the policy programs.[1]

The manner in which the analysis is organized, the questions that get asked and the problems analyzed have an important effect on the results of the assessment. An analysis that does not ask the relevant questions is directly misleading. The same results are likely if the main issues and interests are not taken into account. The decisions under such circumstances may not be the best possible ones for accomplishing wider development objectives.[2]

In summary, evaluation of price policy programs is a very tough task especially because it involves normative issues concerned with human aspirations, economic motivations, and group actions. Those policies cannot be explained solely by economic theories or automatic market mechanisms; other disciplines like political science, sociology, and psychology must also be drawn upon in studies of public

---

[1]One recent attempt to deal with this problem is the use of econometric and simulation models. However, out of the cost of application of these analytical techniques, they require availability of large-scale computers which are not easily found in developing countries. For some of these studies see: Earl O. Heady et al., Future Farm Programs, Comparative Costs and Consequences (Ames, Iowa: The Iowa State University Press, 1972). See also Charles Schultze, "The Distribution of Farm Subsidies," in Redistribution to the Rich and the Poor, K.E. Boulding and M. Pfaff, eds. (Belmont, California: Wadsworth Publishing Co., 1972).

[2]Ideally it can be thought that all the issues should be considered in research analysis. However, the analyst does not have the resources to address all the relevant issues. Thus under conditions of imperfect knowledge and uncertainty scientific methods of investigation have to be applied.

policies. Decisions have to be made however but the ". . . point is just that the tough judgments must be made in any case. And intelligent judgment will involve a variety of dimensions, conflicts of interest, and judgments of value. But will it not be to our advantage to avoid the myopic consequences of the dead hand of perfection."[1]

3.4 Performance Norms or Criteria for Evaluation.

As was suggested in the preceding section, any judgment concerning the manner in which a price policy affects the economic system must necessarily be made with reference to some premises about the ideal performance of the system. The specification of these premises presumes the existence of some aggregate social welfare function, that involves a set of criteria or conditions which do not include judgments concerning how the results are achieved. Given the problems for describing such a function, and since it is the political authority, in an aggregate sense, which may choose between different policy alternatives based upon its perceptions of the variances between and existing performance and its approximation of the aggregate social welfare function, the welfare functions currently

---

[1]James D. Shaffer, Property, Market Structure and Efficiency, Ag. Econ. Misc. Report 1966-9, Michigan State University, East Lansing, Michigan, 1966, p. 11.

accepted in public policy appraisal is the politically estimated function.

The following are a tentative list of criteria which I consider to be a partial approximation of the prevailing social welfare function.[1] This is by no means a complete list of the relevant dimensions of performance, nor does this list provide any order or indication of priority. Each of these conditions implies a set of indicators that need to be made operational for purposes of analysis.

1. To stimulate maximum production and distribution of agricultural commodities at economical prices. With respect to food production, this includes sufficient food to provide the possibility of nutritional adequate diets for all.

2. To facilitate and promote the production and distribution of that combination of goods and related services which best reflects the preferences of consumers and the real relative costs of production. This implies that the system is efficient enough to communicate consumer preferences to producers as well as coordinating

---

[1]The following essay for NCT 105 Fall Seminar was very helpful in establishing these criteria: James D. Shaffer, On Performance Accounts or What Variables are Important in Evaluating the Organization and Control of the U.S. Food Production-Distribution System? Department of Agricultural Economics, Michigan State University, East Lansing, Michigan, November 1972.

production with demand.

3. To foment internal capacity for progressiveness. This assumes that the system rewards practices for rapid adoption of new technology that reduces production and distribution costs for presently consumed goods and services. The development of new products or improvement of existing ones is stimulated.

4. To provide productive and rewarding employment opportunities in the system. Given persistent unemployment in developing countries the employment effect of alternative policies takes on additional meaning.

5. Social and economic equity. This assumes that the system distributes the rewards and wealth in a manner deemed equitable. Here is particularly important that the consequences of government policies and programs are, in the aggregate, equitable. This does not require equal distribution of wealth in recognition of the needs of the system for some mechanism of motivation for individual and collective action.

Those dimensions are of course general goals which need to be more explicitly defined to be used operationally to judge performance. Also, they do not make explicit the

acceptable tradeoffs among the goals. Presumably the desire is to achieve a measure of each at some minimum acceptable level. Nor in reality does each agency contribute to each of these goals in the economic system. The goals must be considered in a macro sense, not as guides to each individual activity or decision. They must be defined in terms of intermediate goals and these in turn operationally defined in terms of measurable impact indicators.[1]

3.5 An Action System Model to Relate Elements of Policy Formulation.

The ultimate end of public policy is presumed to be the improvement of society's welfare and all the various program objectives should converge toward that basic end. The process of formulation of specific program objectives and appropriate program measures with which to pursue those objectives is a very complex one. So in order to help in the understanding of the many relationships among purposes, means, consequences and other concepts related to price policies we will utilize a general paradigm or action system model proposed by Schickele.[2]

---

[1]Garland P. Wood and James D. Shaffer, Institutional Performance in Agricultural Development, Ag. Administration Workshop, Michigan State University, October 26, 1971.

[2]This and the next section draw heavily in Rainer Schickele, Agricultural Policy, Farm Programs and National Welfare, (New York: McGraw-Hill Book Co., Inc., 1954), Chapters 4 and 5.

In a very general view an action system consists basically of four elements: the actor, the end, the means, and the conditions. Their relationships are indicated in the following diagram:

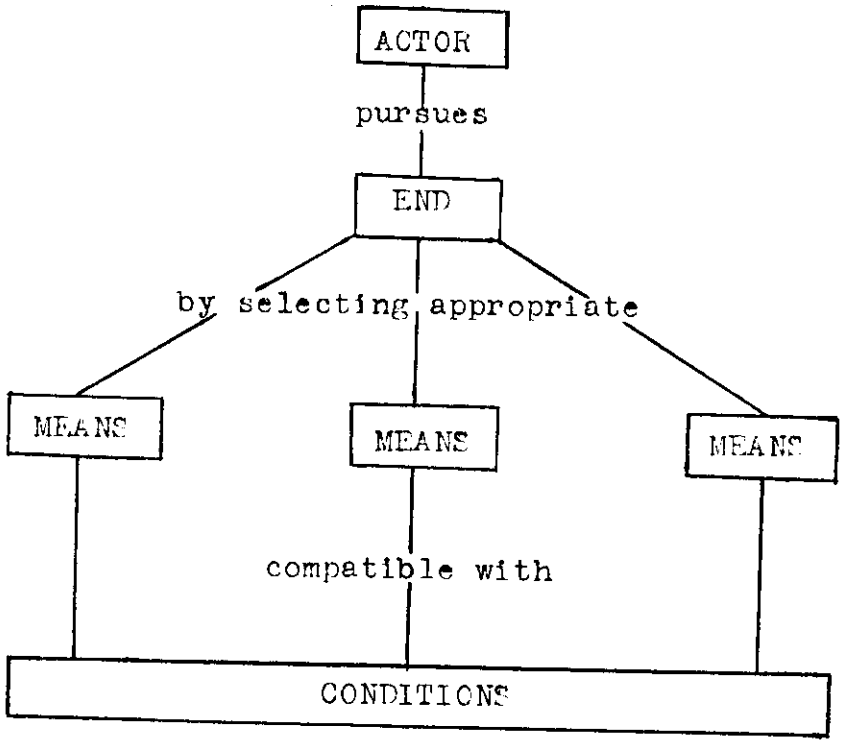


Figure 3.2. Main Elements of an Action System.

Those terms require clarification so as to avoid confusion in evaluating public policies.

The actor, with respect to public policy is a government agency or unit. The actor in any given action system makes the decisions as to what means, policy measures, provisions and programs should be developed to pursue a given end. In some cases, the actor may also

have a choice between various ends, but for simplicity, we shall assume that the end of a policy is given to him.

The end is what the actor wants to accomplish, a desired state of affairs which represents a subjective value.[1] This end needs to be clearly and precisely defined so that its degree of achievement can be observed and measured. In studying a certain policy, it is usually necessary to break it down into various action systems, one for each individual distinct objective. Otherwise it might be very difficult to judge whether the means used to achieve the ends are appropriate or not. They may serve one end well, but fail another. Hence, for the purposes of analysis it is easier if only one end can be designated in an action system, and it should be defined as simply and objectively as possible.

The means are the policy measures, or program provisions, employed to achieve the policy end. There are often many different means that could possibly serve a certain end. Some will work better, some will be easier to administer, some will be cheaper, some will meet less public opposition than others. The choice of these specific measures largely determines the degree of success of a program. The purpose of the policy may be socially desirable, but, if the measures applied are inappropriate,

---

[1]For the purposes of this paper the words end, goal and objective will be used as synonyms.

the whole program may result in failure.

The conditions of an action system are exogenous variables to that system; that is, technical, institutional, and other circumstances beyond the control of the actor, at least with respect to the particular program under consideration. Although policy measures change conditions in the economic system, there are always conditions that limit government action, and those are the ones relevant here. Therefore the problem of policy making also includes a selection of measures compatible with the conditions under which the program must operate.

Once the basic elements of an action system have been defined, we have to trace the relationships between the various action systems or programs making up the price policy, and the general hierarchy of social ends. Let us descend from general ends to concrete and specific issues.

1. The ultimate ends of economic policy are represented in the aggregate social welfare function. A tentative partial approximation list was outlined in the previous section.

2. Descending from this top level of the hierarchy of policy ends we find the central goals of major national policies (fiscal, monetary, trade, labor, industrial, agricultural, etc.). Each of these central policy goals is still quite general in scope and complex in nature; and, for practical

application of concrete program measures, these goals have to be broken down further into more specific program objectives directed at a great variety of situations and concerning various groups of people, regions, and commodities.

3. At the next level and focusing into the field of agricultural price policy, we find the objectives of specific price policy programs. Here the objectives are relatively simple and clear-cut, such as supporting certain commodities at specific prices, regulating intermediate and/or retail product prices, subsidizing adoption of certain inputs, etc.

There are, of course, policy objectives that do not enter in agricultural price policy but influence its effectiveness, such as full employment, stabilization of the general price level, expanding international trade, increasing agricultural credit availability, and so on. Each of them should be carefully studied.

One important consideration in applying the method of constructing action systems is that ends become means and means become ends, depending on how you look at them. An objective in the context of the more specific action system appears as a means in the more general action system. To deal with this dichotomy in evaluating the appropriateness of means, we take the end for granted; but

in order to evaluate appropriateness of an end, we place it in the position of a means serving a superior end. Much confusion can be avoided if the policy objectives of a "lower" or more specific order are traced upward to the "higher" or more general ends.

The next step in the analysis will be the determination of repercussions that a program may exert elsewhere. By their very nature, economic and social development programs have "side-effects" or impacts which do not get listed among the objectives. The people promoting specific changes are too often worried by narrow preoccupations with the tasks at hand to be aware of these related effects and of their importance. The potential importance of such side-effects or interactions should not be underestimated; they can affect both current and future efforts of planned change.[1]

Very often the objectives of two different programs are compatible, but a measure to achieve one may neutralize a measure used to achieve the other. In that case a different selection of means in either program or a modi-

---

[1]There are large amounts of literature about project side-effects, especially related to decisions concerning public programs and projects. See, for example, Roland M. McKean, Efficiency in Government Through System Analysis, (New York: John Wiley & Sons) 1958; United Nations Industrial Development Organization, Guidelines for Project Evaluation, (New York: United Nations), 1972; I.M.D. Little and J. A. Mirrlees, Project Appraisal and Planning for Developing Countries, (New York: Basic Books, Inc., Publishers) 1974.

fication of the end in one of the programs may solve the conflict.

3.6 Summary of Performance Tests.

Having sketched some essential tools for evaluation, we are going to summarize and arrange these conceptual tools in a practical way to have them handy to take up the study and evaluation of agricultural price policies. The basic dimensions implied in the appraisal analysis will be: description, diagnosis, prediction or projection and prescription, as suggested by Shaffer.[1] A complete appraisal would follow such analytical steps.

It is opportune to recall that given the present state of arts, the operationalization of many of the performance dimensions present very serious difficulties. The answers to many of the issues involved here will often have to be put more or less in terms of direction, or general order of magnitude. However, the best efforts have to be addressed toward precision and objectivity in this hard task.

---

[1]For a detailed exposition of such dimensions, see: James D. Shaffer, On the Concepts of Subsector Studies, Technical Seminar on Subsector Modeling of Food and Agricultural Industries. Department of Agricultural Economics, Michigan State University, East Lansing, Michigan, 1970.

A. Description of the Problem.

Examination of the problem situation includes:

1. What has actually happened in recent years and what do people not like about it?

2. What people would like the situation to be; that is, the formulation of the norm or desired state of affairs against which reality is compared and found "wrong."

3. Determination of persons or groups who are adversely affected by the maladjustment and who would benefit in one way or another from a program designed to bring about an adjustment. A consideration of groups opposing public action must also be considered.

B. The Action System of the Policy Program.

A careful study of the elements of the program developed to bring about the desirable changes or improvement in the situation is needed here.

1. The objectives. Designation of the program's objective(s): formulation of objectives in clear and precise terms so as to facilitate the measurement of the degree of achievement of the program with respect to its objectives.

2. The actor agency who manages the program and determination of its administrative effectiveness.

3. The measures or means employed to achieve the program objectives.

4. The conditions. Specification of physical, technical, economic and social conditions to which the measures are adapted and by which they are limited in their use.

C. Position of the Program Objectives in the Hierarchy of Ends.

The evaluation of the program objective from the viewpoint of society involves, at least, the following aspects:

1. Compatibility of the program objectives with societal goals.

2. Intermediate goals which the program objectives are supposed to serve. Consideration of alternative objectives that might serve the superior goals as well or better.

3. Conflicts of program objectives against other major policies or programs. Enunciation of possible alternative objectives that could avoid those conflicts.

D. Appropriateness and Repercussions of the Program Measures.

At this point we take the program objectives as given and test the program measures with respect to the objectives, the conditions of the action system, and their effects outside that action system.

1. Effectiveness of measures and provisions in serving program objectives and ease of administration.

2. Comparison of the cost and benefits from the application of the measures, and proposed ways to reduce their costs or increase their benefits in terms of the objectives.

3. Enumeration of possible alternative measures that could replace some of the present ones to advantage or might be added to increase the efficiency of the others.

4. Adaptability and flexibility of the measures to the conditions under which they are used.

5. Assessment of desirable and undesirable repercussions elsewhere and conflicts with other policies and programs.

CHAPTER IV

CNP'S CORN PROGRAM IN COSTA RICA

4.1 Intervention of the Consejo Nacional de Producción (CNP). Main Features.

In Costa Rica the production and marketing of agricultural commodities is strongly influenced by the government action. Government intervention takes place through several institutions and using many different procedures. Among those institutions and for internal agricultural marketing the Consejo Nacional de Producción or CNP is the most important one, not only for the amount of financial resources that it administers but for its influence upon production and distribution.[1]

The Consejo Nacional de Producción was established in November 1943 to supersede the Junta de Abastos which was intervening in the marketing of grains since 1932. The Consejo is given by law considerable authority in stabili-

---

[1]Though CNP's operation costs were more than 45 millions of colones in June 1971-July 1972, at the present the institution is directly and indirectly administering about 1500 millions of colones per year in its many different programs. See Consultores Ecónomicos e Industriales S.A. et al., Estudio Técnico Administrativo del CNP, Vol. 8, San José, Costa Rica, 1972, and, Interview with the Vice-President of the board of directors of CNP, Lic. Rodolfo Solano Orfila in La República, April 30, 1975, San José, Costa Rica.

zing prices for both the producer and consumer of food products. According to its Organic Law, it has as specific end to foment agricultural and industrial production; to stabilize prices of food and industrial raw materials procuring a fair equilibrium between the relationships of producers and consumers, and to seek the improvement of living conditions of Costa Rican people.[1] To carry out its objectives CNP is authorized to perform a lot of marketing functions: buying and selling, transporting, storing and processing, importing and exporting, price fixing, input distribution, etc.[2]

From its law it can be inferred that CNP's goals are basically twofold: 1) to foment or promote agricultural and [agro] industrial production and 2) to stabilize prices of food and raw materials for producers and consumers. However, those goals are too general for evaluation purposes, and CNP has not clearly differentiated its policies to achieve the goals, nor has it explicitly defined the set of subordinated objectives as well as measures in its several programs. This, of course, would make an evaluation analysis complicated enough because intermediate objectives should be necessarily specified.

The CNP's law gives practically unrestricted discretion with respect to the number and kind of agricultural products

---

[1]Organic Law of the Consejo Nacional de Producción, Chapter I, Article 4.

[2]CNP also administers the monopoly of liquor manufacture in the country.

that it could manage. Yet the Consejo has concentrated its action in trying to promote and stabilize prices (at both the producer and consumer levels), of grains, which are very important in the average diet: rice, beans, corn and sorghum. The Consejo also attempts to stabilize the price of beef in the internal market by determining the number of animals that can be exported each year (export quota). These products represented more than 20 percent of the total value of agricultural production in 1972. So CNP's actions directly affected more than a fifth of total agricultural production. Furthermore, to influence consumer prices, CNP owns a network of sales outlets distributed throughout the country where a great variety of food and processed products, especially convenience staple goods, are sold directly to consumers. Thus the Consejo tries to stabilize prices, at retail level for food products, mainly popular consumption goods.[1] These factors give great importance, from an economic and political viewpoint, to the Consejo's decisions.

Having sketched the bounds of CNP's intervention in agricultural production and marketing in order to obtain a broad picture about its operation we will examine in some detail, the corn program and policy, beginning with the elements of the commodity's action program. This last one

---

[1]Also the government directly fixes prices at retail level through another institution, the Ministerio de Industria y Comercio.

includes a brief description of some elements of the structure of the corn subsector.

4.2 Elements of the Corn Action Program.

4.2.1 Actor and Goals.

Among the activities of the actor of the program (CNP), the corn program is important because it attempts to influence corn production, marketing and consumption. The objectives pursued by the actor are in general terms, to foment production and to stabilize product prices.

It was already indicated that these goals are very general and not stated at an operational level; neither are they specified by programs or activities.[1] It is insufficient to accept the objectives of the corn program as encouraging production and stabilizing corn prices without considering important related questions, for example: is the country going to pursue a self-sufficient policy on corn? Is the introduction of new technology going to be encouraged? Are prices going to be allowed to move in accordance to seasonal fluctuations or be kept fixed all the year? and so on. Those general objectives involve, of course, the attainment of several other subordinated objectives, but the analyst cannot be sure about which of

---

[1] In this sense the separated analysis of the corn program, at least from other grain programs, is artificial but necessary given the available time and resources for writing this paper.

them have been pursued. He can only try to infer based on past actions and institutional behavior which are the more specific objectives followed in the past.

4.2.2 Instruments.

The instruments or means employed to achieve the corn program objectives are basically the same used for the other types of grains. They are listed here as follows:

Purchasing prices: Every year the Consejo establishes minimum purchase prices before farmers plant their crops, and it agrees to purchase at those prices whatever amount of grains being offered to it.

Purchasing agencies: To implement the guaranteed purchase prices, the Institution has a series of purchasing agencies located in the main producing areas, as well as storage and processing facilities.

Wholesale and retail prices: The Consejo sets intermediate prices for its buying and selling operations with wholesalers and retailers.

Retail stores: The Consejo sells directly to consumers in its own retail outlets. The power of opening and closing purchasing agencies as well as retail outlets is an important instrument for CNP's action.

International trade control: Despite the establishment of free trade in grain with the other country members of the Central American Common Market, CNP still has a powerful influence on imports and exports of grains in Costa Rica, and thus on the total supply and prices of grains. CNP itself can import grains in order to carry out its policies. The ". . . power to influence and regulate imports permits the CNP to exercise its functions . . . , more than does the volume of domestic purchases and sales of grains carried out by its agencies and outlets" [González et al. 11, p. 41].

Input procurement: CNP has been participating in selling agricultural inputs such as improved seeds, fertilizers, pesticides, etc. Also some farm machinery services, especially heavy equipment, have been provided at reasonable costs.

Guarantee granting: Even though CNP is not a financing institution it facilitates the use of agricultural credit through granting guarantees for farmers loans before commercial banks.

Other instruments: As an institution for agricultural development, CNP can take several important actions to promote national development, like coordinated action among other public institutions for specific programs or research projects, to contract with producers or distri-

butors for production and marketing services of given commodities, to encourage the creation of different types of cooperatives: production, consumption, distribution of inputs, etc.

4.2.3 Conditions and Overview of the Corn Subsector Structure.

The comprehensive description of the conditions and structure of the subsector is of paramount importance not only for purposes of evaluation and general analysis but for the formulation of the policies themselves. In the context of the structure-conduct-performance framework, a full understanding of structure and conditions is the first step in every kind of analysis. The second step requires an understanding of conduct. Conduct and structure together are the determinants of the subsector or organization's contribution to performance. Though a distinction is sometimes made between social-economic conditions and structure, we will describe for simplicity some aspects of the corn subsector conditions and structure together. Such a description is very limited not only because of the limited information available to the author when he was at Michigan State University but because of great scarcity of corresponding information and data at the present time in Costa Rica.

The importance of the corn subsector for the Costa Rican economy can be appreciated on the basis of the

following facts:

Corn is an important staple in the average diet and very widely consumed, especially for low-income groups. The average per capita consumption is about 60 pounds, and the percent of families that consume corn is about 77 percent for the whole country.[1] These data do not include animal and industrial consumption, which are important especially in beef, pork and chicken feeding. CNP roughly estimates total corn consumption at about 100 pounds per capita, which would leave about 40 pounds per capita for indirect consumption. Indirect consumption seems to have been increasing in recent years while direct human consumption has been steadily decreasing. However, there is great uncertainty relative to the accuracy of indirect consumption estimates.

Even though the value of corn production is about 2 percent of the total value of agricultural production (1973 data), there is a large number of corn producers in the country according to Agricultural Census of 1973. In fact, according to these data, excepting coffee, corn cultivation involves the larger number of farm units for a particular crop; they account for 37 percent of the total number of farms.

---

[1]See Víctor H. Céspedes, Costa Rica: La Distribución del Ingreso y el Consumo de algunos Alimentos, Publicaciones de la Universidad de Costa Rica, Serie Economía y Estadistica No. 45, Ciudad Universitaria "Rodrigo Facio," 1973, pages 69 and 77.

In Figure 4.1 an estimation of the general nature of the internal marketing structure of the corn subsector is presented. The subsector is illustrated in terms of the participants and the way the product flows through the various channels to consumption. The diagram is based on the author's subjective knowledge of the subsector. However, because of the critical lack of relevant information in Costa Rica related to marketing aspects and how the subsector operates, the size of the circles and channels do not represent the relative importance of volumen handled or consumed.[1] Five major routes can be identified in this channel map:

1) Farm-storage-consumption on the farm.

2) Farm-local assemblers/wholesalers-small towns and rural retailers-small towns and rural-non producers consumers.

3) Farm-trucker/assembler-wholesalers-retailer-major urban area consumer.

4) Farm-industry of concentrates-retailers-animal consumption.

5) Farm and truck/assemblers-CNP-wholesalers, retailers, consumers.

---

[1]Also the lack of available information especially related to marketing structure constrains the description of the corn subsector mainly to the aspects of production. The topic of available information is touched upon in the next section.

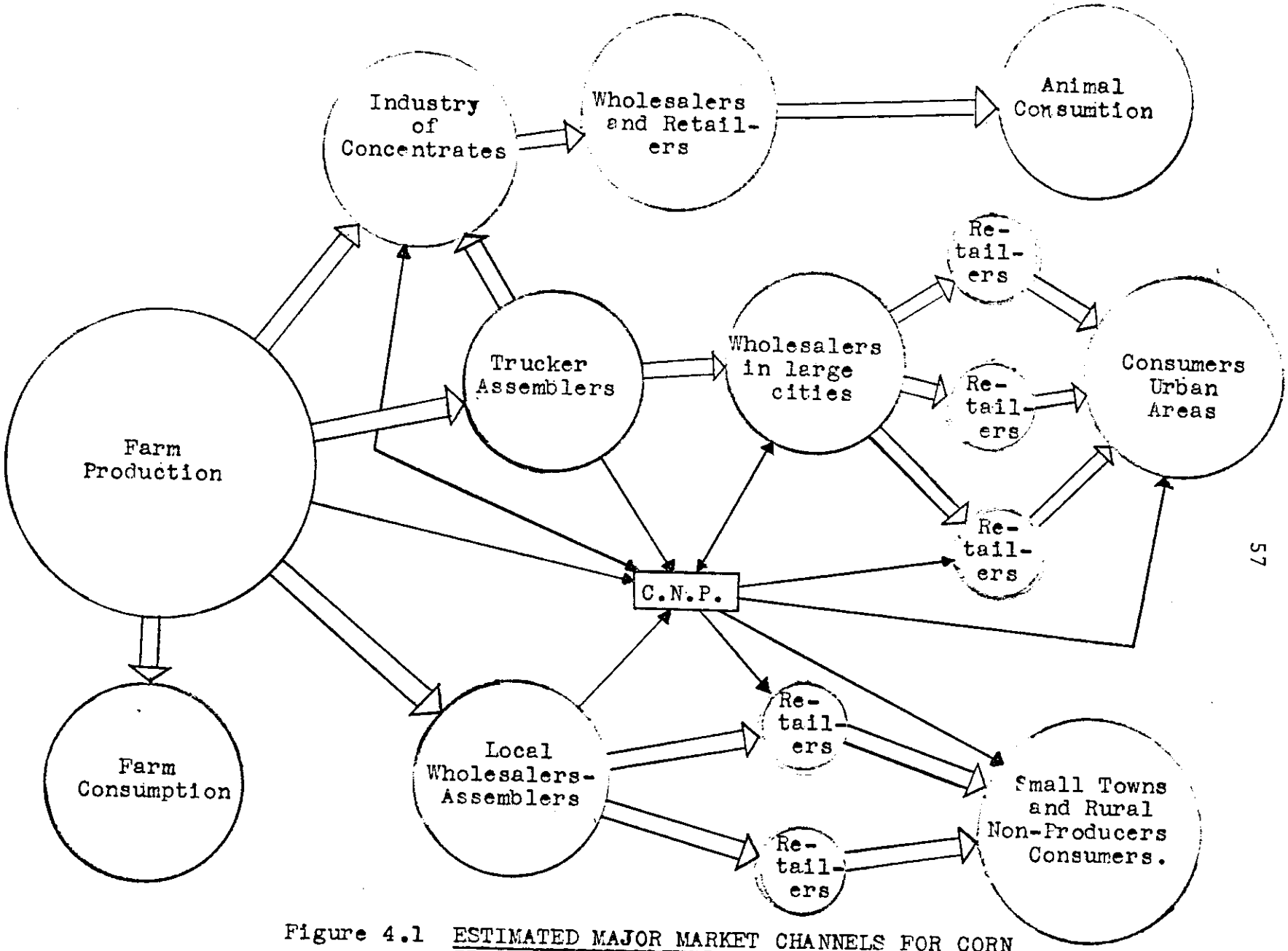


Figure 4.1 ESTIMATED MAJOR MARKET CHANNELS FOR CORN PRODUCTION AND INTERNAL MARKETING IN COSTA RICA

Due to simplicity the map does not show all inter-relationships between routes. Because of the inter-dependence of the different participants (producers, processors, distributors and consumers), policies that affect one of these groups are very likely to have impact over the welfare of the other members in the subsector.

Corn cultivation is largely concentrated in the Dry Pacific Region, South Pacific Region, and West-South Central Plateau Region which account for the bulk of the country's production; however, corn is planted in almost all ecological zones due to its adaptability to different climate conditions.

The main characteristic of corn cultivation in Costa Rica is that it is almost entirely produced in very small-scale farm operations: more than 81 percent of the planted area and about 80 percent of the total production comes from farms whose average planted area is not greater than 2.7 hectares as can be observed in Table 4.1. Figures on farm consumption, which show how the smaller groups of farms have the greater proportion of farm consumption relative to their production are also included. Such figures are a necessary element in the determination of impacts of changes in production and prices on farm income.[1]

---

[1]Besides the proportion of output marketed the magnitude of the price flexibility coefficient is also required. See [Mellor 19, p. 30].

Table 4.1. Costa Rica. Corn: Number of Farms, Area Planted, Production, Farm Consumption, Yield per Hectare, and Average Area Planted Per Farm.

Size of Farms (hectares)	No. of Farms	% of Total Farms	Area Planted (Ha)	% of Total Area Planted	Production (quintales)*	% of Total Prod.	Farm Consumption (quintales)*	Farm Cons. as % of Prod.	Yield per Ha.	Ave. Area Planted per Farm (Ha)
TOTAL	30,012	100.0	51,888	100.0	1,140,155	100.0	380,676	33.4	22.0	1.73
From 0.2 to less than 5	9,696	32.3	7,964	15.3	184,847	16.2	90,004	48.7	23.2	0.82
From 5 to less than 50	15,266	50.9	25,919	50.0	556,012	48.8	204,411	36.8	21.5	1.70
From 50 to less than 100	3,072	10.2	8,288	16.0	169,225	14.8	51,035	30.2	20.4	2.70
From 100 to less than 500	1,825	6.1	7,203	13.9	146,844	12.9	32,701	22.3	20.4	3.95
From 500 and more . . .	153	0.5	2,514	4.8	83,227	7.3	2,525	3.0	33.1	16.43

*1 quintal = 46 kilograms.

Data Source: Office of Statistics and Census, Agricultural Census of 1973, San José, Costa Rica, July 1974.

In a broad sense, the present cropping pattern for corn and associated crops may be put under two categories: 1) monoculture or pure/sole-stand farming; and 2) mixed-cropping. The average corn farmers is so steeped in traditionalism with respect to the cropping pattern practiced that probably it would take much time to adjust the resources and product mix to changing economic conditions. Efforts to introduce changes by the government have been underway for several years. However, there are doubts about the consistency and effectiveness in management of the individual projects.[1] In addition, there seems to be a time lag in adoption of the recommended practices and new enterprises, since, as observed, most of the farmers are as yet to switch from past experiences and traditions as a guide and make use of science and technology. As a result of all these practices, physical yields are still very low (about 22 quintales per hectare according to census data of 1973),[2] and have remained in a situation of stagnation as can be seen in Table 4.2.

---

[1]See for example, Thomas M. Dickey, A Mechanized Corn Project in Costa Rica: A Base Analysis, Master's Thesis, Department of Agricultural Economics, Michigan State University, East Lansing, Michigan, 1974.

[2]For example, U.S. yield corn average was 125.25 quintales/Hectare in 1971/1973 according to John McKeon, Farm Commodity Programs: Their Effect on Planting of Seed Grains and Soybeans, Unpublished Ph.D. dissertation, Dept. of Agricultural Economics, Michigan State University, East Lansing, Michigan, 1974.

Table 4.2. Costa Rica. Corn: Some Production Variables.

Variable	Census of 1950	Census of 1955*	Census of 1963	Census of 1973
Production (quintales)	1,300,196	1,348,696	1,218,256	1,140,155
Area Planted (Hectares)	56,353	66,309	53,045	51,888
Yield/Hectare (in quintales)	23.1	20.3	23.0	22.0
Number of Farms	29,950	n.a.	31,001	30,012
Average Area Planted per Farm (Hectares)	1.9	n.a.	1.7	1.7

n.a.: not available.

*Survey data.

Data Source: Office of Statistics and Census, San José, Costa Rica.

Yields from experimental trials developed in some experimental stations, especially in the Interamerican Institute of Agricultural Sciences, Turrialba, achieved results six times higher than the average yields.[1] During the present year, 1975, a new variety of corn called "TICO V-2" was developed in the experimental station "Los Diamantes," Guápiles, Limón, which is said to produce yields of 70 quintales per hectare. On the basis of these results it appears that there are good opportunities for

[1]Martin Kriesberg et al., Costa Rican Agriculture Crop Priorities and Country Policies, Foreign Economic Development Service, USDA and AID, February 1970, p. 29.

increasing production through the use of improved practices and technology.

Actually, corn production has remained in general stagnant as a result of low yields and reduction in area planted, as is shown in Table 4.2. At the present domestic production it is clearly insufficient to cover national consumption needs. Hence the gap between consumption and production has been filled with increasing imports. These aspects will be examined in further detail later.

The operation of the Central American Common Market, C.A.C.M., in which Costa Rica is a member, and the establishment of free trade in grains within the area is a very critical condition for CNP's policy because the price at which grains could be imported from other Central American countries has to be considered. This makes the design of an "optimal" policy more complicated as the trade relationships with other countries affect CNP's decisions. Given the possibility of international trade in grains, particularly the grain free trade agreement with C.A.C.M. to promote indiscriminately maximum corn production, at "high" support prices can adversely affect societal welfare. If, for example, under free trade conditions within the Common Market, corn support prices were established at such level that were profitable to ship corn from other Central American countries and sell it at the supported price in Costa Rica, this indeed would result in Costa Rica consumers paying a subsidy not only to national producers but to

producers in those countries from which corn was imported. In the same way corn industrial users would face increased costs for their corn input, and would have to compete at a disadvantage with other processors in the Common Market area. The situation is further complicated because the decision to encourage or discourage the production of a particular crop through public policies cannot be solely answered in terms of economic efficiency and comparative production and distribution costs with foreign countries. Existing rigidities in resource and employment mobility, balance of payments situation and other social and economic aspects of the commodity's structure deserve particular consideration.

In the next pages some characteristics of CNP's intervention in the corn program are examined, but a comment about the situation of agricultural information in general, and corn data in particular is first in order.

4.3 The Situation of Corn Information and Agricultural Data.

Despite the importance of agriculture in the Costa Rican economy,[1] the country lacks a reliable and well

[1]The agricultural sector has been playing a crucial role in the economic development of the country. It is at present the most important sector from the standpoint of product generation (it represented more than 20 percent of gross internal product at factor costs in 1974 according with preliminary estimates from the Central Bank), as well as foreign exchange earnings, and it provides the main source of employment in the economy (42 percent of the total labor force as reported by the international Office of Labor in "Situacion y Perspectivas del empleo en Costa Rica," Ginebra, Suiza, 1972).

organized agricultural information and data collection system.[1] There are no government agencies charged with systematic collecting, monitoring, reporting and analyzing production and marketing conditions (price levels, estimated plantings, yields and acreage, production forecasts, short- and long-run demand and supply conditions, etc.) for most agricultural commodities. Outside of census data, taken usually each five years since 1950, there is a deficiency of "good" statistical agricultural data in the country.

Some government agencies like the Ministry of Agriculture and the National Banking System, collect some data, most of the time on the basis of discoordinated action, and as a result such data are very specific in nature. There is also uncertainty about how this information is collected and what special statistical procedures were followed in sample design and estimating procedures. Other agencies, like the Planning Office and the Consejo Nacional de Producción, use rough procedures, mainly based on census data to estimate some production figures between censuses. However, such estimates normally present wide differences

---

[1]A distinction is made between information systems and data systems. Information involves more than statistics or quantified data. It includes non-quantified oral and written information. An information system will include the analysis function while a data system involves only the design and production of quantified data. About this see James T. Bonnen, "Problems of the Agricultural Information System of the United States," paper presented to the Office of Technology Assessment, U.S. Congress, Michigan State University, East Lansing, Michigan, December 1974.

between such agencies. Even more serious, independent surveys undertaken by the University of Costa Rica and other research groups have shown that in some cases like grain data (rice and corn) production and consumption estimates not only present several inconsistencies but they are seriously underestimated.[1]

With respect to corn production and consumption estimates, the available figures are on an annual base and they are estimated by CNP using the following procedure:

Based on data from the agricultural censuses of 1950, 1955, 1963, and 1973 per capita corn consumption is calculated. Implicitly assuming income and price elasticities of demand as constant through time, for years between censuses apparent consumption is determined multiplying the per capita consumption census figure times the size of population in each year. Then subtracting imports and adding exports plus changes in CNP's corn inventories plus a theoretical figure of seed use, a production estimate is derived.

Some other estimations are elaborated by other agencies like the Planning Office, but all of them have in common considerable differences when comparisons are made between them. Furthermore, as it was already mentioned independent survey studies have indicated serious

---

[1]See [González et al. 11] and [Econométrica 6].

deficiencies in those estimates especially underestimation of consumption and production.

With respect to other important components of the corn subsector the situation is worse because in most of the cases the information is not available at all. Such an example of deficiency in basic data can be better pictured in Table 4.3 below. Not only are there no estimates of private corn stocks and capacity available to CNP's decision-makers, but the Institution lacks a good internal inventory control system to effectively help in carrying out its policies.[1] Accurate and adequate information about public and private storage, production, and foreign trade are very critical elements in achieving a successful stabilization policy.

Under such circumstances it is plausible to hypothesize that agricultural growers and marketing participants depend basically on interpersonal channels to obtain information, which is commonly imperfect and most of the time very costly. So it is likely that those groups are making a lot of vital business decisions on the basis of inadequate and inaccurate information. On the other hand, important political decisions related to the corn subsector have been made by the government and CNP based upon insufficient and/or inaccurate information.

---

[1]See Consultores Economicos e Industriales S.A. et al., Consejo Nacional de Producción, Estudio Técnico Administrativo No. 6, San José, Costa Rica, 1972, pp. I-5 and I-6.

Table 4.3. Costa Rica.Storage of Corn (in quintales).

Crop Year	CNP Stock*	Private Stock	Total National Stock
1965/66	59,804	n.a.	n.a.
1966/67	37,043	n.a.	n.a.
1967/68	62,087	n.a.	n.a.
1968/69	86,074	n.a.	n.a.
1969/70	13,282	n.a.	n.a.
1970/71	170,565	n.a.	n.a.
1971/72	90,543	n.a.	n.a.
1972/73	85,239	n.a.	n.a.
1973/74	48,652	n.a.	n.a.
1974/75	555,152	n.a.	n.a

n.a.: Not available.

*At the beginning of the crop year.

Source: Based on Departmento de Planificación y Programación CNP, Boletin Annal CNP, Información Estadísties, agosta de 1975.

All of these factors show that there are very basic data needs that must receive high priorities in developing not only a corn subsector research capability but an agricultural research capability in general. At the same time they call for the establishment of a reliable and efficient intelligence program for collecting, analyzing, and reporting agricultural data.

For the purposes of identifying some basic information requirements for evaluating corn policies as well as policy

design for CNP, a tentative list of production and marketing data that should be periodically collected and analyzed[1] is as follows:

- planted acreage
- production and yields
- quantities used as home-grown seed and purchased seeds
- production costs (improve collection procedures) and used technology
- farm level incomes and prices
- private storage and capacity
- trends in human and industrial consumption
- market participants in the subsector, concentration and degree of dispersion
- marketing margins and spreads
- volumes handled by the marketing channels

From the standpoint of efficiency and lowering cost of collection and processing information it would be very convenient that a project like this be undertaken on a national data collection and analysis system effort,

[1]Some suggestions for helping in such a task are presented in Carlos F. Cervantes, "Some Considerations in Designing a Corn Production Data Collection and Analysis System in Costa Rica," and "Establishing a Public Intelligence Program for Marketing of Agricultural Commodities in Costa Rica," term papers presented in AEC 882, Department of Agricultural Economics, Michigan State University, Summer Terms 1975 and 1974, respectively.

especially due to resultant economies of scale and savings in sampling and enumerating costs.

4.4 Some Economic Considerations about CNP's Intervention in the Corn Program.

Using available information (with the limitations that it carries) some aspects of CNP intervention in the corn program are here analyzed.

In Table 4.4 the evolution of prices established by CNP, production, and international trade of the commodity are presented. Figure 4.2 depicts prices and production behavior. With the exception of the last few years when input prices increased sharply, CNP corn prices have tended to keep fairly static through time.[1] On the other hand, total production has remained very stagnant in general terms; imports have been covering the imbalance between national supply and demand. There is no intention, of course, to explain production variability in terms of CNP's prices alone; reliable empirical knowledge about the degree of responsiveness of supply to price movements is needed in order to formulate an effective price policy. Such supply response has to be specified in terms of the own commodity price, prices of substitutes in production, in-

---

[1]Price figures in Table 4.4 are expressed in current terms. It is desirable to deflate them in order to know whether these magnitudes have been rising or even declining in real terms. Lack of appropriate price index did not allow us to make such transformation.

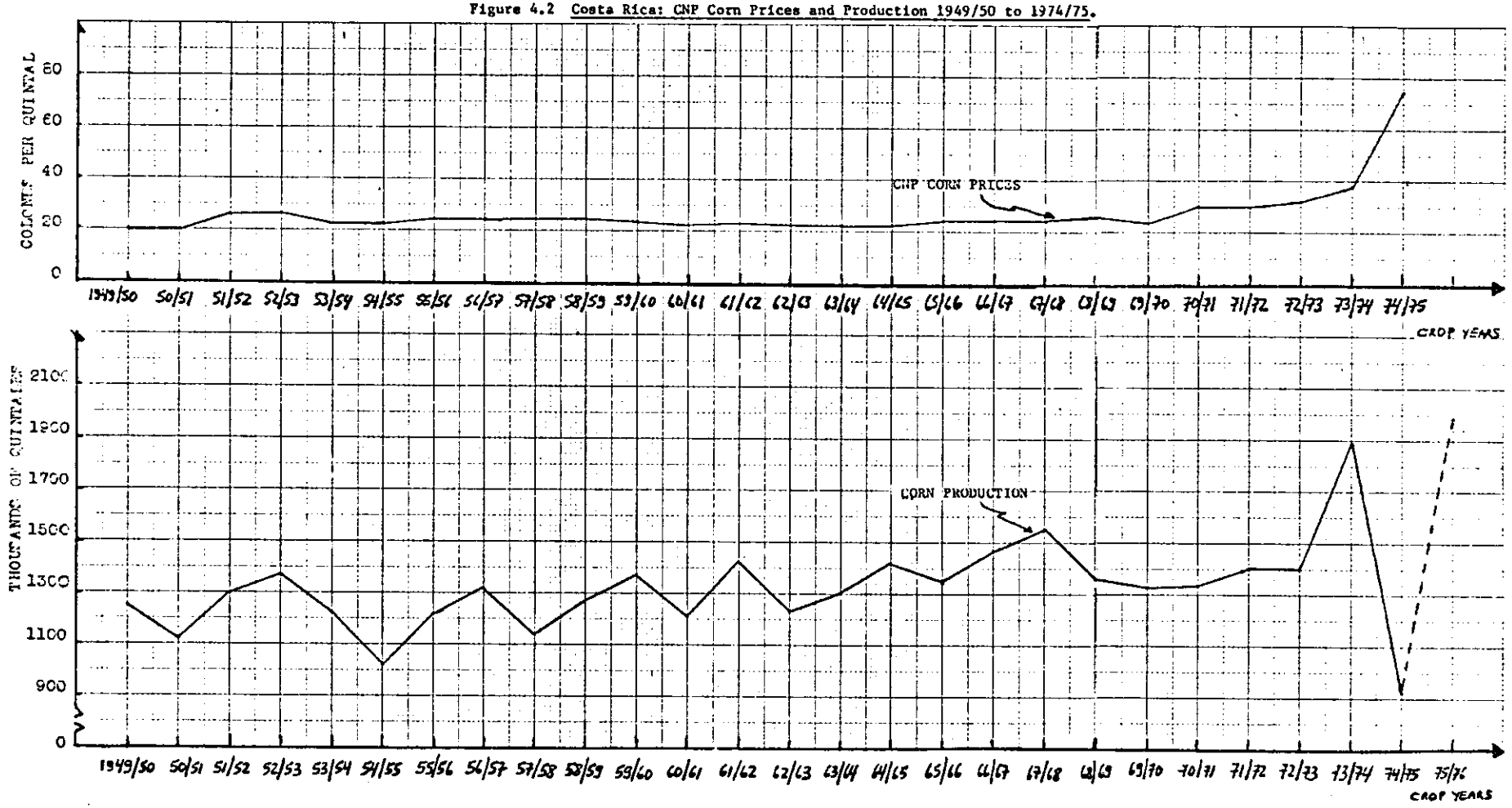
Table 4.4. Costa Rica. Corn: Support Prices, Production and Trade (colones and quintales).

Crop Year (Aug/July)	CNP Support Prices	Production (in quintales)	Imports (in quintales)	Exports (in quintales)
1949/50	20.00	1,250,500	--	--
1950/51	20.00	1,112,600	--	--
1951/52	26.00	1,295,800	--	--
1952/53	26.00	1,366,600	--	--
1953/54	22.50	1,222,500	--	--
1954/55	22.50	1,022,400	--	--
1955/56	24.00	1,224,900	--	--
1956/57	24.00	1,316,500	25	--
1957/58	24.00	1,137,400	69	72,283
1958/59	24.00	1,274,100	87	51,630
1959/60	23.00	1,368,100	62	129,348
1960/61	22.00	1,213,200	11,723	92,391
1961/62	23.00	1,429,700	8,385	254
1962/63	22.00	1,234,700	31,683	308
1963/64	22.00	1,299,600	163,924	116
1964/65	22.00	1,420,800	206,085	234
1965/66	24.00	1,353,780	132,434	1,326
1966/67	24.00	1,471,130	91,848	3,804
1967/68	24.00	1,552,350	144,696	49,435
1968/69	26.00	1,360,560	323,761	4,826
1969/70	23.50	1,333,930	354,283	1,196
1970/71	30.00	1,337,500	776,239	9,935
1971/72	30.00	1,406,430	471,022	7,782
1972/73	32.00	1,402,350	697,304	19,152
1973/74	38.00	1,892,110	954,891	978
1974/75	75.00	914,370	1,658,043*	--**
1975/76		1,994,456***		

SOURCE OF DATA: Department of Economic Research, CNP. Production data from 1949/50 to 1956/57 taken from Charles E. Staley, "A case study of response to agricultural prices in Costa Rica," The Economic Journal, Vol. LXXXI, No. 282, June 1961. The source of data for this author was also CNP. Imports and Exports data from 1949/50 to 1964/65 were taken from FAO, Trade Yearbook, adjusting linearly calendar years to crop years.

* Data goes up to February 1975.
** Data goes up to March 1975.
*** CNP projections.

Figure 4.2 Costa Rica: CNP Corn Prices and Production 1949/50 to 1974/75.



put prices and technology as the main explanatory variables.[1] Without such empirical knowledge it would not be possible to quantify the response of corn producers to changes in corn prices and the prices of substitute crops. This last factor is important in explaining reductions in area planted of corn as shown by census data in Table 4.5. It appears that more profitable investment opportunities out of corn cultivation have been playing an important role for shifting resources to other crops and enterprises.[2] This reduction in the area planted as well as low yields are the general factors in explaining stagnation in corn production.[1]

Looking at the official prices for the other supported crops it appears that CNP has maintained corn

---

[1]Data limitations, especially farm level prices are of course the main obstacle in such a task at the present. However an attempt to quantify supply and demand functions is made in Carlos F. Cervantes, A Corn Supply and Demand Econometric Model for Costa Rica, a term paper presented in AEC 843, Dept. of Agricultural Economics, MSU, Winter 1975.

[2]See Martin Kriesberg et al., op. cit. In particular, the severe fall on production in 1974-75 depicted in Figure 4.2 can be explained basically by a drastic curtailment in area planted (the lowest amount within the last six years of our available data) probably due to relatively high prices for beans and sorghum in 1973-74. The notable increase in bean's area planted is very consistent with this argument. Low 1974-75 corn yield also accentuated production downfall this crop year.

[3]There are stong discrepancies between the 1973 Census data and CNP data with respect to grain area planted, which may not be explained by the few months going between the dates of data collection.

Table 4.5. Costa Rica. Census Data of Area Planted for Some Agricultural Commodities (Hectares).

Commodity	Census of 1950	Census of 1955*	Census of 1963	Census of 1973
Corn	56,353	66,309	53,045	51,888
Rice	23,354	33,950	50,477	65,458
Beans	27,075	37,531	43,805	26,681
Bananas	26,617	n.a.	25,544	36,155
Coffee	48,479	n.a.	81,336	83,407
Cocoa	21,506	n.a.	37,860	20,305
Sugar Cane	19,268	20,116	34,991	38,763
Pastures	n.a.	n.a.	1,338,063	1,558,053

n.a.: not available.

* Survey data.

SOURCE OF DATA: Office of Statistics and Census, San José, Costa Rica.

prices at relatively low levels (particularly with respect to rice prices) with probable detrimental effects on corn production. In general, prices for any crop may be judged too high if they induce import deficits in other crops and export losses for that crop; we do not have at the present enough information to test the validity of this hypothesis with respect to the supported prices of rice, corn and beans. However, it is symptomatic, for example, that on several occasions the price of rice has

Table 4.6. Central America. Corn Support Prices and Transportation Costs, 1969-70 ($/ton).

Country	Support Price	Transportation Cost*	Total Value
Costa Rica	76.09	--	76.09
Nicaragua	71.74	10.85	82.59
Honduras	70.65	23.90	94.55
El Salvador	82.61	23.90	106.51
Guatemala	81.52	32.60	114.12

*From the capital city of each country to San José, Costa Rica.

SOURCE: Econométrica Ltda., Granos Básicos en Centroamerica, February 1970.

been established at such "high" level that the Institution has pressured the government to close the borders against imports of that commodity from Central American countries.

Based on date published by [Econométrica 6, p.93], it can be seen that in the crop year 1969-70 Costa Rican corn price was established at such a level that considering supported prices in other Central American countries, there were no economic incentives for moving corn from them to San José, Costa Rica (Table 4.6). Using the same type of data for rice and beans, it can be shown that CNP prices for these crops in 1969-70 made possible the existence of strong incentives for exporting rice and

Table 4.7. Central America. Some Price Differentials for Corn, 1969-70 ($/ton).

Country	Average Price to Consumers in 1970 (1)	Support Prices (2)	Difference (3)=(1)-(2)	Total Value* (4)	Difference (Price to Consumers in San José)-(total value) (5)
Costa Rica	132.00	76.09	55.91	76.09	55.91
Nicaragua	121.02	71.74	49.28	82.59	49.41
Honduras	83.00	70.65	12.35	94.55	37.45
El Salvador	91.01	82.61	8.40	106.51	25.49
Guatemala	115.00	81.52	33.48	114.12	17.88

* Support price plus transportation cost. Taken from Table 4.6.

DATA SOURCE: [Econométrica 6, p. 93] and Boletin Estadistico Agropecua rio del MAG, 1970.

beans from the C.A.C.M. to Costa Rica.

However, if we compare the marketing margins between prices to consumers and supported prices in each country (column 3, Table 4.7) against the difference between the prices to consumers in San José and the total value made of the support price plus transportation costs (column 5, Table 4.7), the picture changes. Given the highest margins between support and consumers prices in Costa Rica, it would be profitable for a vertically integrated corn distributor-retailer in Honduras or El Salvador, and even in Nicaragua to ship corn from these countries and sell it

to consumers in Costa Rica.

The same kind of situation would hold if in this context, wholesale prices are examined instead of consumer prices. It would hold even if supported prices in every country are very different from prices received by farmers.

In the case of Costa Rica there is a difference between the official supported prices and the prices actually paid by CNP for the corn it buys. This difference is due to discount factors like costs of transportation, humidity, impurities, broken grains, appearance, etc. For the period 1957-1970 the actual price was 8.7 percent below the official price as an average. Unfortunately these data do not allow us to know what the prices received by producers were because CNP typically buys only a fraction of the corn production as can be seen in Table 4.8.

In fact, CNP usually purchases only a very small proportion of corn production. This suggests that the CNP's price is generally lower than the price that other buyers are willing to pay, and apparently producers sell their corn to CNP only when they cannot sell it elsewhere. Other factors that farmers probably consider in selling are that private distributors (truckers, wholesalers) can change their purchasing standards and procedures according to particular circumstances, and at the same time they sometimes offer credit to producers and are able to reach

Table 4.8. Costa Rica. Percentage of Domestic Production Bought by CNP.

Crop Year	Corn	Rice	Beans
1965/66	6.4	31.8	29.0
1966/67	4.4	25.3	0.6
1967/68	2.1	48.1	3.7
1968/69	3.0	45.6	44.2
1969/70	1.3	18.4	2.8
1970/71	2.5	11.9	0.3
1971/72	3.9	41.0	31.7
1972/73	2.3	20.8	0.1
1973/74	1.5	27.9	39.3
1974/75	19.5	13.9	45.7

DATA SOURCE: Departmento de Planificación y Progamación CNP, Boletin Annal CNP, Informaciá Estadistica, agosta de 1975.

them on their own farms.

The small participation of CNP in purchasing corn does not mean that the Institution should necessarily increase its price. All that is required is that market participants expect CNP to secure the minimum prices and their behavior will help to realize those expectations. This is also important in estimating storage capacity that CNP needs for its programs.

From the point of view of international prices CNP has been successful in supporting corn prices close to CIF import prices as can be seen in Table 4.9. Both prices

Table 4.9. Costa Rica. Corn; Import Prices and CNP Support Prices (in colones per quintal).

(1) Crop Year	(2) CIF Import Prices	(3) CNP Support Prices	(4) Difference (2) - (3)
1965/66	26.61	24.00	2.61
1966/67	26.88	24.00	2.88
1967/68	24.25	24.00	0.25
1968/69	24.18	26.00	-1.82
1969/70	22.85	23.50	-0.65
1970/71	26.17	30.00	-3.83
1971/72	31.13	30.00	1.13
1972/73	28.46	32.00	-3.54
1973/74	38.15	38.00	0.15

DATA SOURCE: Departmento de Planificación y Programación CNP, Boletin Annal CNP, Información Estadisties, August 1975.

are not directly comparable because CNP support prices are based on San José or Barranca delivery, while the price for imported grains is C.I.F. port of entry. Nevertheless they are general indicators that at least distortion of economic resource use from the standpoint of efficiency has not been promoted through corn support prices themselves.

One additional point that we want to mention is the procedure by which CNP sets its corn purchasing prices. This procedure is the same in the case of the other grains. It appears that CNP has been trying to guarantee "fair" prices to cultivators. In order to achieve that goal it

is necessary to define first what is a fair price. CNP has tried to determine such prices based on costs of production estimations plus a certain percent profit margin over investment [Fonseca 9]. Two drawbacks of this method are: the problems in determining: 1) What constitutes a reasonable profit? and 2) How to measure costs of production?

With respect to the first question, CNP has used a retribution of one percent of investment [Consultores 2, p. II-1].

In addition to problems of accuracy of the data base for these calculations, there have not been explicit considerations of positive and negative effects upon other crops internally produced. On the other hand, the estimates of cost of production used by CNP are national averages which may be reasonably workable where the production units are similar in size and efficiency, and tend to specialize in the production of the price regulated commodity. Obviously these conditions are not presented in the case of corn cultivation, which raise doubts about the representativeness of such averages.[1] On farms where a wide variety of other commodities are produced, which is

---

[1]About some characteristics of production units see: Ministry of Agriculture, Department of Economic and Agricultural Data, Studies of costs of corn production. Technical Bulletins Nos. 7, 12, 13 and Technical Information Nos. 4 and 5 D.E.E.A., 1972. See also Dirección General de Estadística y Censos, Censo Agropecuario de 1973, July 1974.

the more generalized situation, the utilized procedure does not provide a satisfactory way to allocate fixed or joint costs. Additionally, a major problem with production cost data in Costa Rica is that the available information is ". . . generally both scarce and deficient, so that it hardly reflects the actual situation [González et al. 11, p. 37]. Normally the useful "halflife" of the data is very short especially in a situation of rapid price changes, which makes it necessary and costly to collect data frequently.

An alternative approach that can be tried in estimating costs of production is to base the calculations on the inputs needed and yields expected with the introduction of improving technology. This approach may be of importance in promoting new technology to increase output and lower costs of production.

4.5 Additional Analysis to be Made for a Comprehensive Evaluation of the Corn Program.

In summary, according with the evidence and information presented here, it appears that CNP has been establishing corn prices at relatively low levels with probable negative effects on production incentives. This would have to be weighed against probable positive effects in reducing uncertainty upon farmers prices. To determine in more precise terms the sum of these and other effects from CNP's action on the general objective of encouraging

production would require some sort of technique to single out the impact of the agency from other forces.[1] Econometric techniques, simulation models and Monte Carlo methods may prove to be very useful to deal with such complex problems.[2]

Discouraging corn production may have been positive from the standpoint of the general society up to the extent that consumers enjoyed prices near those prevailing in the world markets. This indeed has to be tested first, especially in view of higher marketing margins and consumer prices in Costa Rica with respect to other Central American countries. Additional analysis would be required for looking at the repercussions of the program in discouraging production and employment (mainly hired farm labor and migration to the cities), and the resultant consequences upon income distribution. Perhaps this aspect could be one of the most serious objections to the operation of the program; however, as long as the resources engaged in corn production moved out to more profitable alternative uses, negative effects, upon these variables may be compensated.

---

[1]A before-and-after comparison, for example, would not be conclusive, however, for it would fail to indicate whether the changes in production without intervention would have been greater, the same, or less in the later period when the government actually intervened.

[2]An efficient input data system is indeed required for application of those high data demanding techniques. Given the situation of agricultural data in Costa Rica the evaluation analysis should be performed in less precise and more general terms.

Given corn prices supported at relatively low levels, distortions in income distribution within the corn farm subsector and rise in land values, with windfall capital grains for land owners, might not be produced. This of course should be subsequently investigated.

One element that deserves attention is to examine whether low corn prices have affected the use of new technology and industrial supplies such as pesticides, chemical fertilizer and improved farm machinery. Some authors believe that if farm prices of supported commodities in the U.S. had been allowed to drop to world prices or levels, new technology would not have been adapted as rapidly as it was, hence (ceteris parabus) supplies would have been smaller and prices higher in the absence of government programs.

The adoption of new technology could be slowed down under sharply lower prices as lack of capital limits the replacement of worn-out farm equipment. But agriculture can be financially impoverished at that point.[1] These positions have to be analyzed in the context of the Costa Rican economy. A method that can be helpful in assessing adoption of technology as a result of the official prices is to develop check points to compare the yields per acre

---

[1]One argument along this line is developed in Donald J. Hunter, ed., Food Goals, Future Structural Changes and Agricultural Policy: a National Basebook (Ames, Iowa: Iowa State University Press, 1969), Chapter 3.

within the price-supported commodities, and these with yields per acre of non-supported crops.

Related with the objective of price stabilization the analysis should basically look at the attainment of such goal from two points of view: a) stabilization at producers level, and b) stabilization at consumers level.

With respect to the first point, CNP's effectiveness is conditioned among other things by the way it uses its price instruments. The way the Institution operates its minimum prices is keeping them fixed during all the crop year. Unfortunately, there is little information about farm incomes to see how these prices affect that important variable.

Be that as it may, it is very likely that the practice followed by CNP in maintaining fixed prices has had an unstabilizing effect upon farm incomes because of the nature of the relationship between output and prices. The inverse relationship which normally prevails between price and quantity tends to stabilize revenue. So if, for example, the price elasticity of demand would be equal to -1.0, price changes would be just sufficient to compensate for quantity changes, and hence total revenue would be constant regardless of the level of production. In contrast a program which stabilizes prices (but not farm sales) will increase income stability over a wide

range of elasticities.[1] Furthermore, a fixed price scheme like the one operated by CNP exerts negative effects on storage because it does not allow prices to increase in line with seasonal production patterns and to cover storage costs over time. There is evidence that CNP suffered considerable losses in grain storage [González et al. 11]. This deficiency can be removed if CNP would allow prices to rise during the year to cover storage costs in accordance with production and consumption seasonality. This truly would not be in conflict with stabilization goals.

Much of the existing confusion in stabilization policies stems from the belief that all that is required to achieve stabilization is to keep prices fixed, and the same misunderstanding applies to consumer prices. In Table 4.10 and Figure 4.3 average corn prices paid by consumers in the Metropolitan Area of San José (by months) are shown. Two stages can be roughly differentiated in corn price behavior: from 1962 to 1969 the price variable remained fairly constant, and from 1970 to 1973 when corn prices increased considerably and fluctuated sharply. We have not determined the causes of such phenomenon but it is evident that in the period 1970-1973 the wide changes

---

[1]Gross receipts will be more unstable with freely fluctuating prices than with stable prices only in the case of severely inelastic demand when elasticity is less than -.5 (in absolute value). Under such circumstances, small crops bring higher revenue than large crops. An excellent exposition about this matter is in [Tomek 29, Chapter 14].

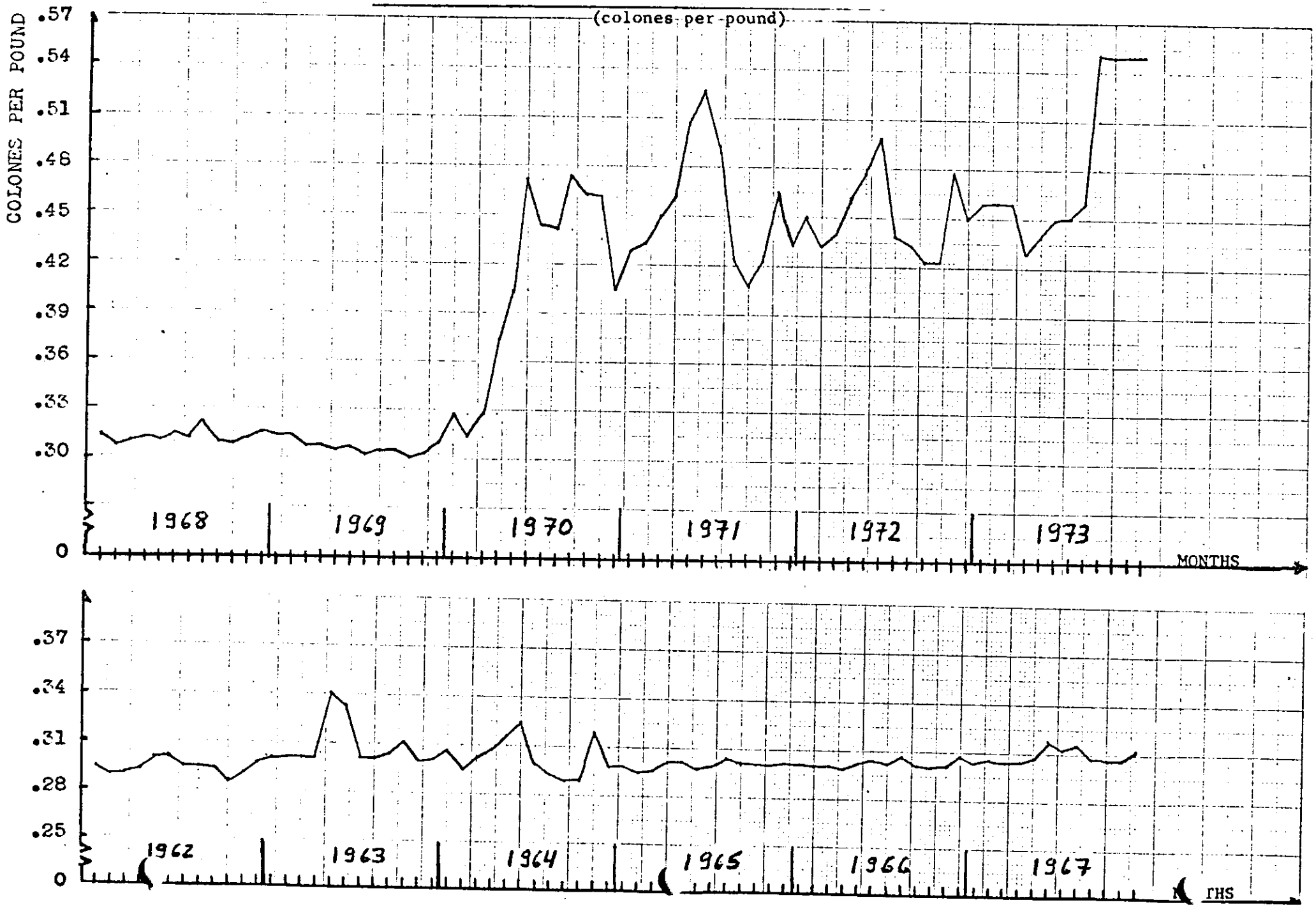
Table 4.10. Costa Rica: Average Consumer Prices in the Metropolitan Area for Corn 1962-1973 (Colones per pound).

	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973
Annual Average*	0.283	0.308	0.302	0.300	0.302	0.309	0.312	0.306	0.407	0,452	0.450	0.484
January	0.294	0.302	0.306	0.298	0.300	0.304	0.313	0.314	0.328	0.429	0.451	0.459
February	0.289	0.302	0.295	0.294	0.300	0.306	0.307	0.314	0.314	0.434	0.432	0.459
March	0.290	0.303	0.303	0.296	0.300	0.305	0.309	0.307	0.329	0.450	0.440	0.459
April	0.292	0.305	0.309	0.302	0.298	0.306	0.312	0.308	0.374	0.464	0.463	0.428
May	0.299	0.342	0.316	0.302	0.303	0.308	0.310	0.305	0.404	0.507	0.478	0.439
June	0.300	0.333	0.324	0.297	0.305	0.318	0.315	0.307	0.469	0.527	0.499	0.449
July	0.293	0.301	0.298	0.299	0.303	0.312	0.312	0.302	0.444	0.463	0.438	0.450
August	0.295	0.301	0.293	0.305	0.308	0.315	0.320	0.304	0.441	0.424	0.434	0.459
September	0.292	0.304	0.289	0.302	0.301	0.307	0.309	0.304	0.472	0.407	0.423	0.551
October	0.286	0.312	0.289	0.300	0.299	0.307	0.308	0.300	0.436	0.423	0.423	0.550
November	0.291	0.299	0.320	0.300	0.301	0.306	0.312	0.303	0.461	0.465	0.477	0.551
December	0.297	0.306	0.298	0.301	0.308	0.312	0.316	0.311	0.406	0.433	0.450	0.551

*1974 Average reached a level of 0.600.

SOURCES: From 1962 to 1972 prices were calculated based on price index of Dirección General de Estadistica y Censos; such indices were discontinued in January 1973. 1973 data were taken from Boletin Estadistica Agropecuario M.A.G.

Figure 4.3 Costa Rica: Average Consumer Prices for Corn 1962-1973.



produced in prices cannot be considered as a good outcome for stabilization purposes. Neither the static behavior in 1962-1969 can be judged as successful policy from the standpoint of the dynamics of a commodity, the bulk of whose supply comes into the market during a small part of the year and whose consumption is continuous, making necessary for that reason that certain marketing functions like storage, transportation, financing be undertaken by somebody on behalf of society.

Those assertions are of course preliminary observations. Indeed the data from Table 4.10 are not enough as to be conclusive. For example, data about the range of variation (maximum and minimum variations) within a week or a month have to be examined. The analysis is complicated by the fact that other institutions, the Ministerio de Industria y Comercio directly intervenes in the level of prices for grains.

Finally a rough outline of research issues and questions to be investigated (in addition to those that have been pointed out throughout this paper) in an evaluation analysis are here identified. They are by no means exhaustive.

1. To what extent farmers receive "fair" prices as defined by CNP. What are the actual farm-level prices that farmers receive?
2. What are the most important factors causing differences in reported production costs? Do small

producers use more or less efficient techniques than large producers? Do small producers have to pay more for their inputs?

3. Are CNP purchasing prices made known to all the participants in the subsector with enough anticipation? CNP should announce all prices simultaneously well in advance of the planting season.

4. An assessment of the effectiveness of CNP's policies and programs with respect to avoiding monopolistic practices among the participants in the corn marketing channel is important. The avowed justification for CNP's operation of retail stores is to stimulate competition. "However, the CNP's action should be subordinate and temporary: subordinate, in that buying agencies and estancos should operate only where there is a lack of competition; temporary, in that its action should end once competitive conditions have been established" [González et al. 11, p.63].

5. What are the implications of consumer price stability or lack of stability? Who benefits from stable prices? There has not been a great deal of research on the stability of consumers prices. There has been some theoretical studies whose conclusions have been mixed; some concluding that no one benefits, others concluding that the benefits are positive [Merril et al. 20].

6. To what extent are product prices determined by contractual terms and how contract arrangements protect market participants against changes and fluctuations in product prices?

7. A consideration of alternative methods of supporting prices, and looking at the impacts on costs and benefits of using different techniques is highly convenient in order to be able to make better choices. For example, the cost to the government of maintaining a given level of support will differ depending on the support method used (and the elasticities of demand and supply). Hence the use of buffer funds, deficiency payments, future markets mechanisms among others, should be explored.

4.6 Concluding Comment.

Throughout this paper we have presented some ideas which will be useful for a comprehensive evaluation of the Consejo Nacional de Producción's policies and programs. This effort should be undertaken on a periodical basis to render improved results on the behavior and performance of the institution as well as the operation of the agricultural sector in general. I believe the benefits of such a task outweigh the corresponding costs.

LIST OF REFERENCES

1. Cochrane, Willard W., Farm Prices, Myth and Reality (Minneapolis: University of Minnesota Press, 1958).

2. Consultores Económicos e Industriales S.A., et al., Consejo Nacional de Producción, Examen del Procedimiento para Establecer los Precios de Compra y los de Venta de Granos Básicos, Estudio Técnico Administrativo No. 9, San José, Costa Rica, 1972.

3. Consultores Económicos e Industriales S.A., et al., Consejo Nacional de Producción, Programa para 10 años, Estudio Técnico Administrativo No. 13, San José, Costa Rica, 1972.

4. Dickey, T. M., Patrick, J. M., Yoo, J., An Evaluation of Selected Price Support, Price Control and Foreign Exchange Policies with Respect to the Food System with Emphasis on Rice and Wheat in the United States and Korea, Unpuplished paper for AEC-941, Dept. of Agricultural Economics, Michigan State University, August 1974.

5. Echeverria, Roberto P., The Effect of Agricultural Price Policies on Intersectoral Income Transfers, Unpublished Ph.D. Thesis, Cornell University, June 1969.

6. Econométrica Ltda., Granos Básicos en Centroamérica, San José, Costa Rica, February 1970.

7. Eicher, Carl and Witt, Lawrence, eds., Agriculture in Economic Development, (New York: McGraw-Hill Book Co., 1964).

8. Fletcher, Lehman B., "Pricing and Allocative Efficiency in Agricultural Development," American Journal of Agricultural Economics, Volume 50, pp. 1294-1306. December 1968.

9. Fonseca, Jorge, "Política de Estabilización de Precios a Nivel de Productor," en Reunión Técnica Nacional de Mercadeo Problemas y Política, San José, Costa Rica, October 15-18, 1971, Instituto Interamericano Ciencias Agricolas.

10. Foreign Economic Development Service, USDA, Improving Marketing Systems in Developing Countries, FEDS Staff Paper No. 7, USAID, Feb. 1972.

11. González, C., Lizano, E., Vogel, R., The Marketing of Agricultural Products in Costa Rica, Associated Colleges of the Midwest and University of Costa Rica, San José, Costa Rica, December 1970.

12. Hallet, Graham, The Economics of Agricultural Policy (Oxford: Basil Blackwell, 1968).

13. Harrison, Kelly, et al., Improving Food Marketing Systems in Developing Countries: Experience from Latin America, Research Report No. 6, Latin American Studies Center, Michigan State University, East Lansing, Michigan, Nov. 1974.

14. Hoover, Dale H., Consumer Expectations and Governmental Behavior: Preconditions for Efficient and Humane Price Policies, Inter-American Development Bank, Seminar on Agricultural Policy: A Limiting Factor in the Development Process, Washington, D.C., March 1975.

15. Johnson, D. Gale, Farm Commodity Programs, and Opportunity for Change (Washington, D.C.: American Enterprise Institute for Public Policy Research, 1973).

16. Johnson, D. Gale, Forward Prices for Agriculture (Chicago, Illinois: The University of Chicago Press, 1949).

17. Krishna, Raj, "Agricultural Price Policy and Economic Development," in H. M. Southworth and B. F. Johnston, eds., Agricultural Development and Economic Growth (Ithaca, N.Y.: Cornell University Press, 1967), pp. 497-540.

18. Marion, Bruce W. and Handy, Charles R., Market Performance: Concepts and Measures, Agricultural Economic Report No. 244. Economic Research Service, USDA, (Washington, D.C.: Government Printing Office, September 1973).

19. Mellor, John W., "The Functions of Agricultural Prices in Economic Development," Indian Journal of Agricultural Economics, Vol. XXIII, No. 1, January-March 1968, pp. 23-27.

20. Merrill, W. C. and Fletcher, L. B., Research Issues Related to Price Policies in Developing Economies, Paper prepared for the Rural Marketing Seminar, University of Kentucky, October 1971.

21. Moran, Michael J., An Institutional Management Perspective to Price Policy, Interamerican Development Banks Seminar on Agricultural Policy: A Limiting Factor in the Development Process, Washington, D.C., March 1975.

22. Riley, Harold M., Improving Internal Marketing Systems as Part of National Development Programs. Occasional Paper No. 3, Latin American Studies Center, Michigan State University, May 1972.

23. Schickele, Rainer, Agricultural Policy Farm Programs and National Welfare (New York: McGraw-Hill Book Co., INC, 1954).

24. Schultze, Charles, "The Distribution of Farm Subsidies," in K. E. Boulding and M. Pfaff, eds., Redistribution to the Rich and the Poor, (Belmont, California: Wadsworth Publishing Co., 1972) pp. 94-116.

25. Shaffer, James D., On Performance Accounts or What Variables are Important in Evaluating the Organization and Control of the U.S. Food Production-Distribution System? Paper for NCT 105 Fall Seminar, Dept. of Agricultural Economics, Michigan State University, East Lansing, Michigan, November 1972.

26. Shepherd, Geoffrey S., Agricultural Price and Income Policy (Ames, Iowa: The Iowa State College Press, 1949).

27. Thirsk, Wayne R., Income Consequences of Agricultural Price Supports in Colombia, Paper No. 43, Program of Development Studies, Rice University, Houston, Texas, Fall 1973.

28. Thompson, Robert L., Agricultural Price Policy as a Factor in Economic Development, Inter-American Development Bank, Seminar on Agricultural Policy: A Limiting Factor in the Development Process, Washington, D. C., March 1975).

29. Tomek, William G. and Robinson, Kenneth L., Agricultural Product Prices (Ithaca and London: Cornell University Press, 1972).

30. Tomek, William G., Stability for Primary Products: Means to What Ends? Occasional Paper No. 28, USAID Prices Research Project and Dept. of Agricultural Economics, Cornell University, September 1969.

31. Wallace, Dudley T., Costs of Agricultural Price Supports, Inter-American Development Bank, Seminar on Agricultural Policy: A Limiting Factor in the Development Process, Washington, D.C., March 1975.