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ABSTRACT

MARKETING PROBLEMS OF SMALL FARM AGRICULTURE: A CASE STUDY OF THE COSTA RICAN POTATO MARKET

By

S. Kenneth Shwede1

Concern for the development of small farm agriculture has often led policy makers to stress production oriented strategies, ignoring the impact of the marketing system on small farm agriculture. When the marketing system fails to adequately coordinate economic activities that link small farmers to larger regional and national markets, it may act as a barrier to the development of small farm agriculture. Identifying marketing problems and opportunities for improving the performance of the marketing system, consequently, is important in establishing programs for the development of small farm agriculture.

In this study, a comparison of the production and marketing activities of small and large Costa Rican potato farmers provided the opportunity to examine the nature of marketing problems facing small farm agriculture. Major goals of the research were to develop a conceptual framework which could be used to explain dualistic marketing system development, and to apply that framework in order to recommend general strategies for improving product markets for small farmers.

The institutional framework for small farm trade was found to be different from that which characterizes large farm trade. Performance of the small farm production marketing system, furthermore, was found

to relate to the nature of the institutional framework for trade, as well as to the resources under the control of the sub-system participants.

Large and small farmers were seen to trade with a different set of assemblers. Large farm trade was characterized by a series of informal contract-like agreements for the exchange of potatoes which greatly improved vertical coordination, and reduced risks. Assemblers would often advise large farmers as to the best time for harvesting potatoes. Large farmers, for their part, offered administrative economies to assemblers, since they sold larger lots of potatoes and were selling potatoes throughout the year.

Small farmer trade, on the other hand, made limited use of contract-like agreements for the exchange of potatoes. Vertical coordination was relatively poor and risks higher. Partly in response to high risks and partly due to their poorer understanding of the marketing system, small farmers adopted strategies which provided protection but limited their profitability.

At the production level small farmers were seen to have the potential to produce potatoes at lower costs than large farmers. When marketing costs were added to production costs, the small farm production marketing sub-system no longer held a cost advantage.

Recommendations for programs to stimulate the development of small farm agriculture arising from this study were formulated in four general areas:

1. Technical assistance to farmers and assemblers to develop their marketing skills, and to introduce them to alternative arrangements for organizing trade.

S. Kenneth Shwede1

2. Information programs which provide farmers and merchants with the type of data needed for effective decision making, such as price and outlook information.
3. Capital improvements intended to improve the technical efficiency of those operating within the marketing system, as well as infrastructural investments designed to stimulate improved performance.
4. Group action programs whereby small farmers would be organized, for example in cooperatives, bargaining associations, or under the auspices of a marketing board, to take advantage of the economies and bargaining power which accrue to large scale trade.

MARKETING PROBLEMS OF SMALL FARM AGRICULTURE:
A CASE STUDY OF THE COSTA RICAN POTATO MARKET

By
Stuart
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A DISSERTATION

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To my parents.

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GLOSSARY OF TERMS

Manzana -- A unit of land area equal to 1.73 acres or .699 hectares.

Carga -- A unit of weight used to measure potato production, and for trade between assemblers and farmers; equal to 18 cwt.

Colon -- The Costa Rican money unit; equal to \$0.117.

¢ -- Symbol used to denote the Colon.

CHAPTER I

PROBLEM AND OBJECTIVES

Introduction

Small Farm Agriculture

The agricultural sector of many developing countries is characterized by the existence of: 1) a relatively small number of large farms controlling a large portion of the land and capital resources; and 2) large numbers of limited resource, small farms.¹ The differences between these two groups of farmers go beyond the variance in the size of their resource base. Small farm agriculture is characterized by: 1) a reliance on owned rather than purchased inputs; 2) limited mechanization of farm operations; and 3) the importance of multi-crop enterprises.² Furthermore, the organization of economic activity by small farmers emphasizes strategies which furnish security and not necessarily those which maximize profits.³ The decisions, or strategies, with

¹Huntly H. Biggs, "New Perspectives on Development Strategies," in Small Farm Agricultural Problems, ed. Huntly H. Biggs, (Fort Collins: Colorado State University, 1974), pp. 8-13; Carl Eicher and Lawrence H. Witt, ed., Agriculture in Economic Development (New York: McGraw-Hill Book Co., 1964), pp. 125-128; Bruce Johnson et al., "Criteria for the Design of Agricultural Development Strategies," Food Research Institute Studies in Agriculture Economic Trade and Development XI (No. 1 1972): pp. 27-58.

²Kelly M. Harrison and Kenneth Shwedel, Marketing Problems Associated with Small Farm Agriculture, RTN No. 5 (New York: The Agricultural Development Council, Inc., 1974), p. 1.

³Clifton R. Wharton, Jr., "Risk, Uncertainty and the Subsistence Farmer: Technological Innovation and Resistance to Change in the Context of Survival," paper presented at the Joint Session American Economic Association and Association for Comparative Economics, Chicago, 28 December, 1968, p. 49.

respect to the nature of these activities are often the result of "inherited institutions and . . . traditionally determined socioeconomic behavior."⁴

Large farm agriculture, by way of contrast, is characterized in addition to size, by: 1) a greater reliance on purchased inputs; 2) higher utilization of mechanized and chemical processes, and 3) greater specialization of farm activity. Large farmers tend to organize their operations around those activities designed to maximize profits. Strategies are, more often than not, determined by economic factors rather than by tradition.

Concern for the development of small farm agriculture follows from both economic and social considerations. Much of the literature⁵ of economic development sets as the goal of agricultural policy, increasing the food surplus, in order to help finance development of the rest of the economy.⁶ The movement of the population out of agriculture and rural areas into urban-industrial settings, along with high rates of population growth and the accompanying urban unrest have created even greater demands on the agricultural sector to fulfill urban food needs.

⁴Ibid., p. 52.

⁵For example, Gustav Ranis and John C. H. Fei, "A Theory of Economic Development," Agriculture in Economic Development, ed. Carl Eicher and Lawrence Witt (New York: McGraw-Hill Book Co., 1964), pp. 181-194; E. A. J. Johnson, The Organization of Space in Developing Countries (Cambridge: Harvard University Press, 1970); William H. Nicholls, "An 'Agricultural Surplus' as a Factor in Economic Development," The Journal of Political Economy 71 (February 1963): 1-29.

⁶The argument states that since the cost of food is a major budget item, by keeping the price low, the wage rates need not be raised, permitting more labor to be employed.

Presently, small farmers provide the food needs for roughly 50 percent of the world's population, and for any particular country they may supply the food for as much as two-thirds of the entire population.⁷ Furthermore, small farm agriculture, with its high output-labor ratio and large pool of underemployed labor is said to be technologically capable of increasing the size of its agricultural surplus.⁸

Small farmers and their families, given the size of the agricultural sector in many developing countries, constitute a large portion of the national population, and yet, are often the poorest members of the society. Per capita income of rural residents trails far behind that of urban dwellers. Minimum services (electrical power, running water, health care, education, etc.) and supplies of desirable consumer goods are often not available to rural residents.⁹ Low income, inadequate employment opportunities and limited access to land resources have caused massive migration by small farmers out of agriculture,¹⁰ often further aggravating urban problems. It has been suggested that programs

⁷Biggs, p. 8.

⁸Additionally, small farm agriculture is less capital intensive, thereby freeing capital resources which can be invested elsewhere for more rapid industrial growth. Peter Dorner, Land Reform and Economic Development (Baltimore: Penguin Books, Inc., 1972), p. 103.

⁹"Relatively little detail is known about problems of the economic and institutional functioning of farmers' and other residents' operation of buying and selling (particularly buying) food, agricultural inputs and consumer goods . . ." Michael T. Weber, "Towards a Locational-Institutional Paradigm for Research to Improve Rural Food-Supply-Area Marketing Systems in Developing Countries: A Case Study from Costa Rica," seminar paper presented to the Department of Agricultural Economics, Michigan State University, East Lansing, 1975.

¹⁰Biggs, p. 10.

directed towards the traditional farm subsector, would lead to a more equitable distribution of income as well as to increased employment.¹¹ Additional purchasing power from higher real income would permit the farmer to achieve a higher standard of living, and stimulate industrial demand. Part of the increased production could then be taxed away to finance the extension of basic services to rural areas as well as to subsidize growth in other sectors of the economy.

The Marketing System

Trade of agricultural products is characterized by varying levels of organization and coordination.¹² On one extreme trade is highly coordinated, being characterized by contracting, futures markets, technologically advanced handling and processing, highly specialized and trained personnel, and frequently, vertical integration of different marketing and production stages under one administration. At the other extreme, trade is poorly coordinated. The number of intermediaries is very large and their size extremely small; additionally, many are only part-time merchants. Price distortions and uncertainties are exaggerated by limited information and knowledge of market opportunities as well as by "crude and inefficient handling, packaging, storage, and product preservation practices."¹³

¹¹See for example: Agency for International Development, Proposal and Recommendations for the Review of the Development Loan Committee: Guatemala-Small Farm Development, A10-DLC/p-2137 (1975), p. 85.

¹²W. O. Jones, Marketing of Staple Food Crops in Africa (Ithaca: Cornell University Press, 1972), p. 72.

¹³Kelly M. Harrison, et al., Improving Food Marketing Systems in Developing Countries: Experiences from Latin America (East Lansing: Michigan State University, Latin American Studies Center, 1975), p. 80.

The marketing system serving large farmers need not be, and often is not the same one which serves small farm agriculture.¹⁴ The marketing system which serves small farm agriculture has been characterized by small scale trade with a proliferation of limited resource traders, lowering profits and raising costs. Trade is often, but not exclusively, local in scope with a few linkages to larger regional and national markets.¹⁵ Large farm agriculture, on the other hand, rarely depends solely on local markets. By trading directly with large assemblers, large farmers are able to bypass local markets and establish linkages with regional, national and international markets.¹⁶

A picture emerges of two sub-systems; one for small farm agricultural production and marketing (SFSS) characterized by limited resource farmers trading through a poorly coordinated marketing system. The other, for large farm agricultural production and marketing (LFSS), comprised of specialized farm operators trading in a more efficiently coordinated marketing system.

The Problem

Many of the programs designed to stimulate the development of small farm agriculture have tended to focus only on technical production-increasing strategies while ignoring market system improvements or relegating them to a secondary or adaptive role.¹⁷ When marketing functions

¹⁴Jones, p. 230; Harrison and Shwedel, p. 3.

¹⁵Carol Ann Smith, "The Domestic Marketing System in Western Guatemala: An Economic, Locational and Cultural Analysis" (Ph.D. dissertation, Stanford University, 1972), pp. 12-13.

¹⁶R. J. Bromley and R. Symanski, "Marketplace Trade in Latin American," Latin American Research Review IX (Fall 1975): p. 21.

¹⁷Harrison, et al., p. 2.

have been considered the state has often intervened in: 1) the pricing process by fixing minimum and/or maximum prices to the various agents in the production distribution system through fiat or supply management, and/or 2) the distribution of inputs and/or food products.

The choice of strategies for dealing with the marketing problems of small farm agriculture has often been based on assumptions reflecting a lack of knowledge and misconceptions of the marketing system. It is not uncommon, for example, to find policy makers holding the belief that the marketing system is characterized by unscrupulous middlemen engaging in speculative activities to gain outrageous profits.¹⁸ That there may be certain structural conditions producing externalities which lead to poor performance,¹⁹ is not considered. The role of marketing as a positive force in development²⁰ is also ignored.

The question of who captures the possible benefits from changes in the marketing system is side-stepped. The benefits of these changes do not necessarily accrue to the participants of the SFSS, but rather to those who are in a position to best take advantage of new economic

¹⁸Harrison, et al., p. 3; Edith H. Whetham, Agricultural Marketing in Africa (London: Oxford University Press, 1972), p. 96.

¹⁹Harold Riley, et al., Food Marketing in the Economic Development of Puerto Rico (East Lansing: Michigan State University, Latin American Studies Center, 1970), p. 7; N. R. Collins and R. H. Holton, "Programming Changes in Marketing in Planned Economic Development," in Agriculture in Economic Development, ed. Carl Eicher and Lawrence Witt (New York: McGraw-Hill Book Co., 1964), pp. 363-365.

²⁰[Marketing] development, above all others, makes possible economic integration and the fullest utilization of whatever assets and productive capacity an economy already possesses. It mobilizes latent economic energy. It contributes to the greatest needs: that of the rapid development of entrepreneurs and managers . . ." Peter Druker, "Marketing and Economic Development," Journal of Marketing 22 (January 1958): 253.

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opportunities as they present themselves. Furthermore, government policies designed to deal with perceived market related problems often work at cross purposes. Lele argues, for example, that price controls may have an adverse effect on "the growth of food production by increasing risk and uncertainty and reducing returns to investment in food production."²¹

By investing few, if any, resources in improving the marketing system which serves small farm agriculture,²² government programs have allowed these farmers to continue trading under conditions which provide limited incentives for economic growth. Ruttan, in a review of rural development programs, stated that "the potential gain from comprehensive programs of rural development that can be achieved in the absence of expanding commodity markets and more efficient factor markets are limited."²³ That the marketing system has failed to furnish adequate coordination of economic activities to effectively link small farmers to larger regional and national markets, suggests that the marketing system has, in effect, acted as a barrier to the development of small farm agriculture. Thus, identification of marketing problems and opportunities for improving the performance of the marketing system becomes an important consideration in establishing programs for the development of small farm agriculture.

²¹Uma Lele, "Considerations Related to Optimum Pricing and Marketing Strategies in Rural Development," paper presented at the XVI International Conference of Agricultural Economists, Nairobi, Kenya, 26 July, 1976, p. 1.

²²Ibid., p. 32.

²³Vernon W. Ruttan, "Rural Development Programs: A Skeptical Perspective," Agricultural Development Council, New York, 1974, (Mimeographed Draft), p. 25.

Marketing Problems of Small Farmers: A Review of the Literature

The process of development, due to the accompanying structural transformation of society,²⁴ requires institutions and procedures to integrate and coordinate activities within a transformed society:

The essential aspect of an underdeveloped economy and the factor the absence of which keeps it underdeveloped is the inability to organize economic efforts and energies, to bring together resources, wants and capacities, and so to convert a self-limiting static system into creative, self-generating organic growth.²⁵

When the marketing system is functioning efficiently, it coordinates by sending price signals as well as related information concerning market conditions to those operating within the system, telling them what to produce, how to produce (i.e., resource utilization), and how to divide the production among potential consumers. Additionally, an effective system maintains a flexibility that would signal the system participants to adjust their actions to changing circumstances. A well-coordinated marketing system stimulates desired economic and social performance by: 1) reducing risks through better information; 2) rewarding economies in production and distribution; 3) making the demand for products more elastic by stimulating new processes, storage, etc.; 4) developing the administrative capacity by providing opportunities for efficient organization to better coordinate production with demand; and

²⁴Kuznets has characterized development as "a sustained increase in per capita or per worker product, most often accompanied by an increase in population and usually sweeping structural changes." Simon Kuznets, Modern Economic Growth: Rate Structure and Spread (New Haven: Yale University Press, 1966), p. 1.

²⁵Drucker, p. 255.

5) incorporating marginal groups into society by providing them access to economic and social opportunities.²⁶

Just as a marketing system which works efficiently can play an important role in stimulating development, an inefficient system can create barriers to development:

Performance failures of the agricultural marketing system in coordination and physical distribution can retard the transition from a traditional to a high productive economy. Uncertainty and unrewarding farm product prices, unreliable and expensive farm inputs, high prices and uncertain supplies of food to urban consumer all encourage²⁷ the maintenance of low-productivity subsistence farming.

The fact that marketing systems do not develop uniformly throughout the economy nor within various sectors of the economy implies that there would also be differential rates and patterns of growth associated with different marketing systems.

Differences in the marketing systems serving different sectors, in some respects, relate directly to the nature of the exchange process. Schmid and Shaffer conceptualize exchange being conducted within certain frameworks (or systems) defined by intangible social relationships and sets of property rights:

Status--transactions are governed primarily through prescribed roles associated with social position. Roles are not defined exclusively in economic terms. Exchange ratios are not subject to bargaining and are set through customs.

Administrative--transactions are controlled by those participants in positions of political authority.

²⁶Reed Moyer, Marketing in Economic Development, Occasional Paper No. 1 (East Lansing: Michigan State University, Institute for International Business Studies, 1965).

²⁷Kelly Harrison, James D. Shaffer, and Michael T. Weber, Fomenting Improvements in Food Marketing in Costa Rica (East Lansing: Michigan State University, Latin American Studies Center, 1975), p. 11.

Exchange rates are variable within limits. Roles may be civic as well as economic in nature.

Bargained--transactions are governed by a set of impersonal rules. Exchange rates are bargained, with material success as the final goal. Where a bargained price system dominates, political and economic positions are usually distinct and separate.²⁸

While no one framework is unique to a specific society, the status framework tends to characterize the more traditional society.²⁹

Other factors influencing exchange have also been suggested. They include: 1) volume of transactions; 2) distance from the market; and 3) accessibility (e.g., road conditions).³⁰ Small farms often trade in small lots, and may be located at great distances from the market. Merchants who deal with small farmers under these conditions often adopt strategies which, while allowing them to stabilize their business operations (e.g., handle a wide variety of product), result in poor vertical coordination of the marketing system.³¹

The difference in organization of marketing institutions as they relate to development are suggested by Harrison and Shwedel when they state that, ". . . organizations which serve the large farmer are not

²⁸James D. Shaffer and Allan A. Schmid, "Community Economics: A Framework for Analysis of Community Economic Problems," Department of Agricultural Economics, East Lansing, Michigan State University, 1973, p. 34. (Mimeographed.)

²⁹Raymond Firth, "Social Structure and Peasant Economy: The Influence of Social Structure Upon Peasant Economies," in Subsistence Agriculture and Economic Development, ed. Clifton R. Wharton (Chicago: Aldine Publishing Co., 1969), p. 27.

³⁰Juan Antonio Aguirre, "The Economics of Milk and Beef Production in the Humid Tropics: A Case Study of San Carlos County, Costa Rica" (Ph.D. dissertation, Cornell University, 1969), p. 209.

³¹J. Pablo Torrealba, "Improving the Organization of Fruit and Vegetable Production-Assembly System in the Coffee Zone of Colombia: A Case Study of the La Mesa Region" (Ph.D. dissertation, Michigan State University, 1972), pp. 255-257.

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able to provide the same services to the small farmer."³² Furthermore, they report: "The organizations which serve the small farmer often lack the resources and abilities of the large-farm distribution organizations."³³ It would be expected, therefore, that the inability of the SFSS distribution sector to provide the same services as that of the LFSS, due to its lack of resources, would lead to a different type of behavior and performance which would result in differential growth rates.

Size of operation has been suggested as a key variable in determining sources of disadvantage between the two sub-systems. Marketing organizations ". . . tend not to be scale-neutral, and have a commercial bias that favors large-scale producers."³⁴ Large numbers of small farmers make the costs of providing marketing services very high per unit handled,³⁵ and the large numbers of middlemen result in situations approaching atomistic competition.³⁶ Higher cost operations are reflected at the farmer level by lower product prices for the grower.³⁷

Other factors relating to the organization of trade, besides size, further add to the costs of marketing. Limited information and

³²Harrison and Shwedel, p. 4.

³³Ibid., p. 4.

³⁴Ibid., p. 4.

³⁵Ibid., p. 5; Kenneth L. Bachman and Paymon P. Christensen, "La Economía del Tamaño de las Granjas," in Desarrollo Agrícola y Crecimiento Económico, ed. H. M. Southworth and B. F. Johnson (Mexico: Union Tipografica Editorial Hispano Americana, 1970), p. 253.

³⁶Riley, et al., p. 26.

³⁷Charles Fletschner, Structural Patterns in the Marketing of Selected Agricultural Products in Chile: The Position of Small and Large Growers, Research Paper No. 10 (Madison: University of Wisconsin, Land Tenure Center, 1971), p. 2.

poor understanding of the structure and conduct of marketing system and its operation result in passing up many opportunities for either technological or commercial innovations. With respect to fruit and vegetable distribution in Puerto Rico, Riley, et al., concluded, "Neither producers nor merchant truckers were able to understand the nature of consumer demand sufficiently to perceive the need or profitability of washing, grading and carefully handling perishable commodities."³⁸

Alternative forms of trade are limited and those that exist provide few opportunities for small farmers. Large numbers of buyers and sellers have resulted in trade being carried out along lines of personal relationships. In some cases the relationship may be based on a status framework,³⁹ while in others it will represent an attempt to establish assured trading partners at moderate costs.⁴⁰ In either case these relationships restrict the farmers' trade to one or a small group of middlemen. The small farmer who will go to the market himself is an occasional seller not often aware of the current level of prices, and under pressure to complete his business on the same day he comes to market.⁴¹

Many of these factors which distinguish SFSS marketing from that of the LFSS, also contribute to a higher level of risk and predispose SFSS participants towards certain strategies which reduce risk by

³⁸Riley, et al., p. 174.

³⁹Sidney W. Mintz, "Internal Market Systems as Mechanisms of Social Articulation," Proceedings of the 1959 Annual Spring Meeting of the American Ethnological Society (Brooklyn: n.p., 1959), p. 124.

⁴⁰William O. Jones, Marketing Staple Food Crops in Tropical Africa (Ithaca: Cornell University Press, 1972), p. 254.

⁴¹Jones, Marketing Staple Food Crops, p. 253.

narrowing the range of decisions and discouraging change which threatens the established order.⁴² These strategies designed to reduce risk by small farmers, such as diversification and the reluctance to try new methods, make ". . . assembly expensive and reduce the flow of coordinating information in the system."⁴³

When governments have initiated marketing programs aimed at developing the agricultural sector, the SFSS had a lesser chance of benefiting and usually suffered the negative impacts of government policy.⁴⁴ Harrison and Shwedel report that: "Government programs . . . often unwittingly encourage or strengthen the position of firms at monopolization points,"⁴⁵ which has the effect of further disadvantaging the position of small farms. Attempts to deal directly with small farmers through government purchasing programs have not always met with success because they "lack the administrative capacity and the manpower required to purchase small scattered supplies of food crops."⁴⁶ Moreover, the position of larger and more capital intensive units has been strengthened due to the predominance of efficiency as the criterion for research

⁴²Erven J. Long, "Institutional Factors Limiting Progress in Less Developed Countries," in Agricultural Sciences for the Developing Nations, ed. Albert H. Moseman (Washington, D.C.: American Association for the Advancement of Sciences, 1964), pp. 3-14.

⁴³James D. Shaffer, "On the Concept of Agricultural Commodity Development Boards as Institutions for Fomenting Economic Development," East Lansing, 1973. (Mimeographed draft), p. 2.

⁴⁴Fletschner, p. 2.

⁴⁵Harrison and Shwedel, p. 4; Monopolization points are capital intensive points within distribution channels, such as "large regional assemblers, processing plants, exporters and national grain wholesalers," Ibid., p. 4.

⁴⁶Uma Lele, The Design of Rural Development: Lessons from Experience (Washington, D.C.: World Bank Publication, 1975), p. 107.

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and market evaluation, . . . ignoring equity as a measure of performance."⁴⁷

Group activity for marketing small farm production has often centered around the concept of formal cooperative societies replacing traditional middlemen. Cooperatives have had some success in trading crops such as sugar, cotton, tobacco, and coffee,⁴⁸ because many of the characteristics of the product markets for these crops facilitate the marketing operation of cooperatives.⁴⁹ For most other crops, especially those destined for domestic consumption, however, cooperatives have failed to make much headway.⁵⁰ Successful intervention in these markets requires levels of administrative skill and entrepreneurial capacity often lacking in cooperative organizations.⁵¹ Furthermore, cooperatives incur extra costs and have problems different than those of private traders.⁵² This makes it difficult for cooperatives to effectively organize and compete with private traders in the domestic food market.

⁴⁷Harrison and Shwedel, p. 4.

⁴⁸Lele, Considerations Related to Optimum Pricing, p. 28.

⁴⁹Being mostly for export crops, it is relatively easy to establish a centralized marketing facility. Often the international price sets the domestic price which frees cooperatives from risky decisions as to how much to purchase at what prices. Finally, some of these crops require processing which gives the cooperatives an opportunity to vertically integrate; the value added from processing is often enough to allow the cooperative to offer an attractive price to the farmer. Ibid., pp. 28-29.

⁵⁰Ibid., p. 27.

⁵¹Lele, The Design of Rural Development, p. 107.

⁵²For example: 1) paid staff; 2) interest paid on credit; 3) costs of accounting; and 4) conflict of interests among its members. Edith H. Whetham, pp. 191-192.

Objectives of the Study

A pessimistic picture of small farm agriculture emerges. On one hand, structural differences have resulted in a marketing system which has been unable to render those services necessary for the task of stimulating and coordinating the development of the SFSS. On the other hand, the same situation which resulted in the relatively poor performance of the SFSS's marketing system reinforces behavioral patterns which contributed to that very same poor performance.⁵³ When government has intervened, rather than stimulate the development of small farm agriculture, its policies with respect to the agricultural marketing system have often failed to improve the economic conditions of the small farmer, and in some cases further disadvantaged the SFSS vis a vis the LFSS. Group action has largely been unsuccessful, except in a few special cases, as an alternative means of overcoming many of the marketing problems faced by small farmers.

The general objective of this study, therefore, is to identify opportunities which will allow the marketing system serving small farmers to become a more dynamic institution effectively coordinating and integrating the SFSS into the larger economy as a productive force contributing to national economic development.

The specific and operational objectives are to:

⁵³ Georgescu-Roegen's concept of tradition that, "... not only embodies the rules of conduct for one individual, but also dictates the attitude of the individual towards tradition itself," appears to sum up the relationship between the SFSS and its distribution sector. Nicholas Georgescu-Roegen, "The Institutional Aspects of Peasant Communities: An Analytical View," in Subsistence Agriculture and Economic Development, ed. Clifton R. Wharton, Jr. (Chicago: Aldine Publishing Co., 1969), p. 79.

1. Develop a conceptual framework which could be used to explain dualistic market system development. This will require postulating a set of hypothesized differences between the marketing system of the LFSS and SFSS.
2. Describe and analyze the production-distribution systems used by small and large Costa Rican potato farmers in order to examine and test the differences hypothesized to exist between the two sub-sectors.
3. Identify the marketing problems of the Costa Rican potato farmers, especially those problem areas where the marketing system acts to inhibit the economic growth of the small potato farmers.
4. Recommend programs for improving the performance of the potato sub-sector with particular concern for small farmers.
5. Apply the knowledge gained from the case study of Costa Rican potato farmers to recommend general strategies for improving the product markets linking small farmers to larger regional and national markets.

Plan of the Study

Chapter II outlines the conceptual framework which is used to study the dualistic nature of agricultural product markets. The hypotheses explaining the differences between the marketing systems of the LFSS and SFSS are set forth. Finally, the rationale for choosing the Costa Rican potato production-distribution sector and the methodology used for this study is explained.

Part II of the thesis examines the Costa Rican potato production-distribution sector. Chapter III gives an overview of the potato

production-distribution sector and explores the factors which influence the demand for potatoes. Chapter IV deals with the potato production process. General characteristics of small and large growers are discussed, and an attempt is made to identify differences in the production practices. Chapter V examines the process by which small and large farmers trade potatoes, indicating institutional arrangements and practices used by both groups. Chapter VI analyzes the assembly process--operating costs and trading practices--to demonstrate that the two groups of farmers trade with different groups of assemblers, and that these differences in assembly operations influence grower welfare. Chapter VII evaluates the wholesale process. While it will be seen that both the SFSS and LFSS trade with the same wholesalers there are, nevertheless, differences in trading arrangements which influence the cost characteristics of the two sub-systems. Chapter VIII analyzes prices and margins for potato marketing.

Part III presents the general summary and conclusions of this study. Chapter IX relates the hypotheses set forth in Chapter II to the results of the study of the Costa Rican potato market. Recommendations for improving the performance of the Costa Rican potato production-distribution sector are made with special emphasis on alternatives designed to improve the position of the small growers. Chapter X attempts to generalize the conclusions of this study recommending strategies for small farm agriculture. Some potential areas for future research in the marketing problems of small farm agriculture are identified.

CHAPTER II

CONCEPTUAL FRAMEWORK AND METHODOLOGY

Marketing Systems

Churchman has defined a system as "a set of parts coordinated to accomplish a set of goals."¹ Coordination, in turn, implies that there is an interdependence between different parts or components of the system;² these can be identified permitting causal relationships to be postulated and to some extent measured. The components of a system interact within an environment which influences both the pattern of their relationship and limits their set of possible activities. Additionally, the finite resources, both physical and managerial, act as further constraints to the activities which a system or any of its components may undertake.

A system model is the representation of the reality of a particular system. When it is a dynamic model it allows for change by the inclusion of variables as part of the activity set which permit the process of transformation to take place. Change, may be considered as occurring as the reaction to: 1) exogenously induced phenomena; and/or 2) dissatisfaction with system performance as measured against

¹C. West Churchman, The Systems Approach (New York: Dell Publishing Co., Inc., 1968), p. 29.

²James D. Shaffer, Designing Agricultural Marketing Systems in Developing Countries (East Lansing: Michigan State University, Department of Agricultural Economics, 1972), p. 7.

goal statements. The nature and intensity of change is a function of the: 1) induced phenomena; 2) dissatisfaction, and 3) resource base.

A dynamic system model may be defined in terms of:

1. The total systems objectives and, more specifically, the performance measures of the whole system.
2. The systems environment.
3. The resources of the system.
4. The components of the system: their activities, goals, and measures of performance.
5. The management of the system.³
6. The behavioral assumptions of the different components.

The institutions, participants, and activities involved in agricultural marketing comprise a system. It is considered that the goal of the agricultural marketing system should be to integrate the production activities of many separate and individual farm units into the national economy so that the agricultural sector: 1) serves as a positive force in economic and social development; and 2) participates equitably in the distribution of the benefits arising from the growth of the nation's economy.⁴ The operational objective of the marketing system would, therefore, be the effective coordination of the activities of those involved in the production and marketing of agricultural products in such a way that those activities which contribute to the system's goal

³Churchman, p. 3.

⁴As pointed out in Chapter I policy makers'--those responsible for setting goals--understanding of the workings and potentials of marketing system reflects a lack of knowledge and misconceptions. Thus, the positive role of the marketing in economic development is often neglected in the formulation of national goals and passed over in the design of development programs.

are: 1) clearly perceived; and 2) positively reinforced; while 3) those which hinder the implementation of the system's goal are successfully discouraged.

To consider the coordination of production and marketing as the objectives of separate systems renders as arbitrary the distinction between the production and distribution activities.⁵ "Farm production and product distribution are interdependent in a commercial economy;"⁶ it is more proper, especially for problem solving, to consider marketing as part of a production-distribution system extending from the production-input decision mix through to consumer demand.⁷ Marketing, therefore, would include those activities involved in production, assembly, wholesaling, retailing, and consumption as well as those set of institutions and rules governing transactions, or the exchange of property rights.⁸ The interaction of production and distribution activities within this institutional framework results in a set of system outputs or performance:

It is characteristic of food marketing problems in countries undergoing accelerated economic development that they arise simultaneously all along the line from the planning of production to meet market demand, through transport, wholesaling, and processing to retail distribution.⁹

⁵Kelly M. Harrison, et al., Improving Food Marketing Systems in Developing Countries: Experiences from Latin America (East Lansing: Michigan State University, Latin American Studies Center, 1975), p. 4.

⁶Shaffer, p. 7.

⁷Christopher O. Andrews, "Improving Performance of the Production-Distribution System for Potatoes in Colombia" (Ph.D. dissertation, Michigan State University, 1969), p. 24.

⁸Harrison, et al., p. 4.

⁹J. C. Abbot, "The Role of Marketing in the Development of Backward Agricultural Economies," Journal of Farm Economics XLIV (May, 1962): 359.

This study will apply an institutional approach to market analysis. This approach requires the researcher to "ask how would different rules, different power distribution, different objectives affect performance?"¹⁰ The performance objectives are considered as normative statements describing desired outcomes. The system's concept permits this type of analysis by providing a framework in which interactions are explicitly postulated between the resources, rules, and organization of a system and its performance. Evaluation of the system is designed to determine what is hindering desired performance and what steps are necessary to move it to a more desirable state.¹¹

The Framework of Analysis

Using a systems framework, the agricultural marketing system will be conceptualized in terms of four separate, but interacting components: 1) participants; 2) institutional framework; 3) behavioral relationships; and 4) performance. The participants are considered as those individuals and groups involved in activities within the environment defined by the system. The institutional framework refers to the structure (i.e., concentration, barriers to entry, etc.) of the various industries operating within the system as well as to the set of rules (institutions) which govern the interactions between participants. The actions of the participants as they work towards fulfilling their individual objectives are considered the behavioral relationships. The performance

¹⁰Gerald R. Campbell and Thomas S. Clevenger, An Institutional Approach to Vertical Coordination in Agriculture, Working Paper Series, W-P-I (Madison, Wisconsin: North Central Project 117, 1975), p. 13.

¹¹Ibid., p. 13.

refers to the outcome or consequences of activities undertaken by the participants in relation to system objectives.

The participants in the system interact with one another by means of transactions involving the transfer of property rights, that is, the control of resources and the claims to the future benefits accruing to those resources.¹² The exchange of these rights takes place within a framework of institutional arrangements that prescribe and facilitate this interaction. Behavior of participants is a function of the set of institutional arrangements which circumscribe and regulate their participation in the market process. The behavior or conduct of the participants determines the performance of the system. In what may be said to approximate a feedback loop, if the outcomes from the performance are compatible with the participant's private goals, he will develop standard operating procedures (SOP) to routinize his behavioral reaction to the institutional structure through which he acts. Unsatisfactory performance, on the other hand, will cause the participant to seek change within the system. The ability to influence change will depend upon the resources at his disposal. If the participant is unable to favorably affect system performance, or only a part of it, he will most likely modify his behavior developing new sets of standard operating procedures to minimize the effects of undesirable outcomes. While such conduct may be beneficial to the participant, in many cases it will prove to be counter productive to the system's goals, especially as they relate to national developmental objectives. At this point it may

¹²James D. Shaffer and A. Allen Schmid, "Community Economics: A Framework for Analysis of Community Economic Problems," East Lansing, Michigan State University, 1973, p. 19. (Mimeographed.)

be necessary for an exogenous force, e.g., governmental policy, to directly intervene to bring about change in the system's performance.

Behavioral relationships, as stated above, are a reaction to the institutional arrangements and the participant's ability to perceive them and act upon them. This may be expressed as:

$$(1) \quad B = f(I, R)$$

where B is the behavior of the participants, I the institutional arrangements, and R a variable representing the participant's perceptions and resources. The institutional arrangements at any point in time are the result of previous changes in the system and random factors, which may be represented as:

$$(2) \quad I = f(\Delta I, r)$$

where ΔI is a variable denoting that the present set of institutional arrangements are the results of previous changes, and r , which represents random effects. The changes in the system are the result of the perception of the participants and their ability to influence change, as well as exogenous factors such as government intervention:

$$(3) \quad \Delta I = f(R, E)$$

where E represents the set of possible exogenous factors. Performance can be considered as the stream of consequences of behavioral patterns:

$$(4) \quad P = f(\Sigma B)$$

where P is the performance. By substituting (1) into (4), performance is expressed as a function of the sets of institutional arrangements and participants' abilities:

$$(5) \quad P = \Sigma f(I, R)$$

By substituting (3) into (2), institutional arrangements, expressed as:

$$(6) \quad I = f(R, E, r)$$

are the result of perceptions and abilities of the participants, and exogenous factors, such as governmental programs. Thus, if performance of two sub-sectors differed, it would be expected to relate to differences in I and R. Since I is also a function of R and E, it would further be expected that the effects of exogenous factors such as government programs are not the same, i.e. the benefits are not distributed equally. Programs designed to change sub-sector performance would be directed at modifying institutional arrangements within the sub-sector. This would require altering perceptions and resources of the participants as well as assuring that the effects of exogenous factors are favorably distributed to that sub-sector.

Using the framework to identify marketing problems of small farm agriculture and indicate opportunities for improving the performance of the marketing system, implies that research and programs directed at altering institutional arrangements within the SFSS would affect the performance of small farm agriculture. The programs would be directed to eliminate differential effects of exogenous factors and improve the participants' understanding of the system and their ability to influence its working. The specific programs would depend upon the types of institutions and participant relationships existing in the sub-system.

Application to the SFSS and LFSS

This section will develop a set of specific hypothesized differences between the SFSS and LFSS within the context of an agricultural marketing systems model. These hypotheses will be tested in Part II of this study using a case study methodology. The results will allow for general differences to be identified and programs recommended.

Participants

Those who are involved with the daily functioning of both sub-systems include farmers, wholesalers, retailers, processors and consumers. Differences between the two sub-systems with respect to the individual participants are hypothesized to relate to four general areas: 1) resources; 2) perceptions; 3) position; and 4) modernity.

In the most obvious sense it is the contrast in the resource base which differentiates the two sub-systems. Besides larger size--land area and/or output--participants in the LFSS: 1) own more inputs into the production process; and 2) their access to nonowned factors of production is easier. There will be differences in the stock of human capital reflected in: 1) education; and 2) acquired knowledge of the marketing system. Furthermore, access to policy makers--which is also considered as resource--will vary from one sub-system to the other. This will be reflected in the degree of participation in those nontrans-action activities which influence the whole system's performance.

The second area is that of perceptions--the idea of reality based upon an ordering of random as well as selective observations of the environment. It is hypothesized that when compared with the reality of the sub-system's structure and operation the LFSS participants' perception will more closely resemble the real situation than will the participants of the SFSS's perception of their sub-system's structure and operation.

Those factors which influence one's position include: 1) education; 2) residence; and 3) occupational activity. It is hypothesized that there will be differences in positions when comparing the participants of the two sub-systems. Specifically, it is expected that

the LFSS participants will have more formal education, live in different locations, and will tend to function more as specialized managers than as workers. The importance of the participant's position is that roles are often defined for specific positions. This results in certain behavioral patterns specified as either appropriate or inappropriate for that position;¹³ hence, the accepted roles of the LFSS and SFSS participants, along with those activities which are considered as socially acceptable behavior, will be different.

Modernity¹⁴ is, to a degree, a way in which reality is perceived. By defining part of the value system, it influences change-proneness. Using the concepts of trust, future orientation, control over destiny, and innovativeness as indicators of modernity, it is hypothesized that the large farm sub-sector participants will tend towards nontraditional opinions; that is, they will be more: 1) future oriented; 2) likely to believe that they can control their own destiny; 3) willing to trust non family members; and 4) willing to innovate.

Institutional Framework

In countries characterized by a large traditional subsistence agriculture, marketing systems for large and small farm agriculture have been considered as separate.¹⁵ In countries like Costa Rica, for example, which are largely urban, and where commercial agriculture, as

¹³James D. Shaffer, "Notes for a Theory of Personality for a Theory of Consumer Behavior," East Lansing, n.d., p. 10. (Mimeographed.)

¹⁴See Joseph A. Kahl, The Measurement of Modernism: A Study of Values in Brazil and Mexico (Austin: The University of Texas Press, 1968).

¹⁵William O. Jones, Marketing Staple Food Crops in Tropical Africa (Ithaca: Cornell University Press, 1972), p. 79.

opposed to subsistence agriculture, characterizes food production,¹⁶ it may appear that institutional differences do not result in separate structures for each sub-system. This, it is hypothesized, is not necessarily the case. Doubt arises as to the existence of more than one system for agricultural marketing because the same infrastructure, specifically the same marketplaces, is used by both groups. Close examination should show differences in the institutional framework of the two sub-systems with respect to: 1) conditions of entry; 2) exchange rules--e.g., inspection of products, credit policies, relationships between buyers and sellers; size and time of transactions, etc.; 3) risk;¹⁷ 4) the systematic acquisition and transfer of information; and 5) the scale of operation.

Trade, therefore, will be overwhelmingly with other participants of the same sub-system. Since a common infrastructure is used by both sub-systems, there will be, however, some trade across sub-system boundaries. It is hypothesized that the costs of cross sub-system trade will be such that neither group will find it particularly attractive, and thus its importance will be minimal.

¹⁶M. Kreisberg and H. Steele, Improving Marketing Systems in Developing Countries: An Approach to Identifying Problems and Strengthening Technical Assistance (Washington, D.C.: U.S.D.A., Economic Research Service, 1972), p. 6.

¹⁷Risk refers to the probabilities that the situation will change during the period of one's intervention in the market system. Among these possible occurrences are the following: a) demand changes; b) robbery; c) spoilage, and d) damage.

Behavioral Relationships

The behavior of an individual may be considered as the reaction to a set of stimuli.¹⁸ If the stimuli vary or the perception of those stimuli vary from individual to individual, the responses will also vary. In the context of this analytical framework, the set of institutional variables are considered as the stimuli to which participants react. Since the perception of reality varies and the stimuli are distinct, it is not unreasonable to expect differential behavioral patterns for the two sub-systems. It is hypothesized that the differences will center around the following variables: 1) risk aversion strategies; 2) organization of the economic unit; 3) exchange activities; and 4) reaction to poor system performance. Out of the behavioral patterns differentiated by these variables separate sets of standard operating procedures will emerge for each sub-system.

The organization of the production unit is closely related to, if not in some cases really the implementation of risk aversion strategies. The SFSS will adopt risk aversion strategies which, it is hypothesized, are distinguished from those of the LFSS by: 1) a larger number of different production activities (e.g., crop diversification); 2) performance of activities at various vertical levels within the sub-system; 3) decisions based more on custom than on economic criteria (e.g., maintaining constant levels of inputs and output over time); and 4) the relative absence of innovative activity.

The exchange process within the SFSS, it is hypothesized, will be characterized as taking place within an atmosphere of greater

¹⁸John Platt, "Social Traps," American Psychologist 28 (August, 1973): 642.

distrust. This will result in a diversion of economic activity towards guaranteeing security by the participants involved in transaction, e.g., physical inspection. The LFSS exchange, it is hypothesized, will be characterized by more vertical coordination. This will be reflected by differences in: 1) the level and quality of communication between the participants; 2) the interdependence in the decision-making process of participants at different vertical levels, and 3) the use of pre-existing arrangements for trade.

Performance Characteristics

Performance of each sub-system may be thought of as the stream of consequences ensuing from participant behavior patterns. It is hypothesized that the performance of the two groups, each being the result of divergent behavior influenced by differences in institutional make-up of the sub-systems, will also be different.

It was hypothesized that participants in the LFSS engage in transactions characterized by a higher level of coordination. It is further hypothesized that this will result in a performance more closely associated with the objectives laid out for the agricultural system: 1) lower costs per unit of output; 2) higher rates of return to the participants; 3) larger agricultural surplus; and 4) greater stability of supply. Over time the LFSS will increase relatively in importance as the source of supply, since many of the conditions outlined above will enable the participants to capture greater returns through innovative managerial behavior and appropriate response to government programs.

Differences in the performance of the two sub-systems, furthermore, may relate to the ability of the LFSS to react to unfavorable conditions by lowering or shifting the costs of externalities generated

by the marketing system. The ability of the LFSS to protect itself and/or to influence the direction of market system change in their favor will be reflected by differences in: 1) control of economic resources; 2) contact with government officials; and 3) the level of group activities. The SFSS relative inability to deliberately influence the direction of market system change will result, it is further hypothesized, in the SFSS bearing most of the cost for the market system's inefficiencies.

Methodology

In order to examine the hypotheses laid out above a case study approach¹⁹ was used to examine the production and marketing activities of small and large Costa Rican potato farmers and middlemen. "The procedure of studying actual cases . . . has a number of advantages over a more abstract or theoretical approach: 1) concreteness; 2) appealing to human interest; and 3) by studying a number of cases it is possible to derive certain generally useful principles."²⁰ Thus, while this approach necessarily is restricted to a particular case over a specific period of time, it nevertheless, will provide detailed information useful for advancing the understanding of the linkages between institutional arrangements and small farm welfare:

The structure and conduct of groups which are supposed to serve the farmer should be examined. Information would be obtained as to whether or not certain services were

¹⁹See Earl R. Babbie, Survey Research Methods (Belmont, Calif.: Wadsworth Publishing Company, Inc., 1973), p. 37.

²⁰Glenn L. Johnson and Lewis K. Zerby, What Economists Do About Values (East Lansing: Michigan State University, Center for Rural Manpower, 1973), p. 2.

provided, and if they were, then the quality of these services would be measured.²¹

The decision to concentrate the study on the production-marketing of only one product relates to the nature of the Costa Rican agricultural economy. Small farm agriculture is not subsistence agriculture in terms of primary production for on-farm consumption and lack of participation in the national market.²² Rather, it is commercial agriculture in that production is destined for the market and not for on-farm consumption. While there may be many enterprises usually only one or two occupy most of the farmer's capital and labor, and account for most of his income. This binds the farmer's welfare with the performance of the production-marketing system of that product.

Crop to be Studied

At first it was considered that either corn or beans should be selected as the case study crop since they are harvested by both small traditional farms as well as by highly "modern" and mechanized farms. They are also important from the standpoint of the national nutritional situation since they represent major components in the diet of large numbers of the Costa Rican population.

There was, however, a major drawback in using either of these crops to identify marketing problems of small farmer agriculture. The government intervenes directly in the marketing of these crops through: 1) buying stations in rural areas; 2) price controls at the retail

²¹ Kelly M. Harrison and Kenneth Shwedel, Marketing Problems Associated with Small Farm Agriculture, RTN No. 5 (New York: The Agricultural Development Council, Inc., 1974), p. 7.

²² This does not mean to imply that in countries such as Costa Rica subsistence farming does not exist, rather it is not the dominant form--in importance nor in numbers--of food production.

level; and 3) both retail and wholesale distribution. To undertake the study of the production-marketing system for one of these crops would have required major emphasis to be placed on determining the effectiveness of government intervention--an interesting topic but not the primary concern of this thesis.

Having rejected the selection of either corn or beans, the best possible choice appeared to be a vegetable crop. Besides the author's knowledge of the production relationships of these crops it was considered that a vegetable product offers certain advantages from a policy as well as research point of view.

Since there is no direct government intervention in the marketing of these crops, the channels and relationships which developed are the results of action by participants designed to satisfy certain needs or solve problems of the system. These solutions were endogenously induced, not arising from exogenous political intervention. Thus, differences in marketing should be the result of inherent advantages and/or disadvantages of the participants and their marketing arrangements.

Among the various alternative vegetable crops it was decided to focus on the potato production-marketing system. Preliminary observations suggested the existence of two sub-systems. Since most of the production (90 percent) was concentrated in one geographic area, this simplified the analytical process by eliminating the location-transportation variable as a source of difference between the two sub-systems. A successful production cooperative had been marketing the potato production of its members; this, it was considered, would offer the possibility of investigating cooperatives as an alternative form of group action for marketing.

Research Procedure

It was decided to work with potato farmers in two villages--Tierra Blanca and Llano Grande--both approximately 20 minutes north of the city of Cartago. The choice of the two areas related to one of the initial objectives of comparing the effects of group action. This became impossible as the cooperative in Tierra Blanca ceased marketing potatoes before this study was completed.

The farmers in the two areas were identified by using census data and the membership list of the Tierra Blanca cooperative. All farmers were then stratified by the number of manzanas²³ planted in potatoes. The first strata of one manzana or less accounted for 53 percent of the farmers in Llano Grande and 22.6 percent of the farmers in Tierra Blanca. The second strata comprising plantings between one and three manzanas included 28 percent and 50 percent of farmers in Llano Grande and Tierra Blanca respectively. The third strata of those planting greater than three manzanas encompassed the rest of the farms in the regions.

In Llano Grande 15 farmers were interviewed. This represented 27 percent of the total number of farmers. There were 30 farmers interviewed in Tierra Blanca, representing 28 percent of the total number of farmers. Those interviewed were randomly selected within each stratum, and the number per stratum was chosen to approximate the percentage of total population represented by each stratum. The interviews with farmers were conducted by the author in Llano Grande, and by the author and a cooperative official in Tierra Blanca.

Although the population was initially divided into three strata, it was subsequently decided to divide the farmers into two groups

²³One manzana equals 1.73 acres or .699 hectares.

representing small and large farmers. Small farmers were those having planted two or less manzanas of potatoes for the March 1975 harvest. The decision to divide the population at two manzanas was based on discussion with local farmers and merchants; the consensus being that anything less than two manzanas in potatoes was "small." Furthermore, it was considered that two manzanas represented an upper limit to the size of a family farm operation; that is, an average family would be able to cultivate approximately two manzanas of potatoes without extensive use of hired labor.

To identify the assemblers operating in the area a list was drawn up based on interviews with farmers and assemblers.²⁴ There were 56 assemblers identified operating in the region. The assemblers were divided into two groups according to the location of their washing facilities: 1) those in the Cartago-San Rafael area (30 assemblers); 2) those in the rural area (23 assemblers); and those from other regions who purchase at the Cartago market (3 assemblers). A random sample of 15 assemblers from the first group, and 10 from the second group was selected. The interviews were conducted by the author in the rural areas, and by the author and a first year University of Costa Rica agronomy student in the Cartago-San Rafael area.

San Jose potato wholesalers were identified on the basis of a census of wholesalers undertaken by the Integrated Program of Agricultural Marketing (PIMA) in February 1975. There were 30 wholesalers in all, of these a sample of 10 was randomly selected. The interviews were conducted by the author.

²⁴They were asked: "Who are the other people who buy potatoes in this area?" When no new names were given it was considered this list represented almost, if not all, of the assemblers.

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To examine the relationship between the tablestock consumption of potatoes and income levels, data collected by the Costa Rican Statistics and Census Bureau regarding incomes and expenditures were used. This data was collected from a sample population of 3,219 urban families throughout Costa Rica. Each week of the year a different sub-sample was selected and interviewed. They were asked to list the quantity and price of each article bought--food and nonfood--for each day of the week. Daily, an enumerator would visit each of the families in that week's sub-sample to see that they were correctly filling out the list of purchased articles and to answer any questions that they may have had. This data, then, is the composite weekly consumption for 3,219 families taken in different groups one week at a time during the time span of one year.

The industrial users of potatoes were identified from a 1972 PIMA study²⁵ on the commercial uses of fruits and vegetables. New processors were identified by comparing the products mentioned in the 1972 study with those products available in local stores as of September, 1974. All 12 of the processors were interviewed by the author and a PIMA employee.

An analysis of the potato marketing system was prepared in draft form based on partial analysis of the above data. This, in turn, was reviewed by the Committee for the Formation of Regional Marketing Cooperative²⁶ as to the accuracy of the information of the potato production-

²⁵Carlos R. Cervantes A. and Roy McDonald B. Consumo Industrial de Frutos y Hortalizas en Costa Rica durante 1972 (San Jose: IFAM-PIMA, 1973).

²⁶This is a Cartago base group of farmers, extension and bank personnel, as well as an assembler.

marketing system. Their observations were incorporated into this study.

CHAPTER III
OVERVIEW OF THE POTATO PRODUCTION MARKETING
SYSTEM AND DEMAND FACTORS FOR POTATOES

System Overview

Production

The production of potatoes in Costa Rica is centered in the Central Meseta, in an area northwest and east of San Jose (Figure III-1). Most of this production, however, is concentrated on the slopes of the Irazu Volcano, some twenty miles from the capital, in the province of Cartago. This one area supplies ninety percent of the national production (Table III-1). The province of Alajuela produces the next largest quantity of potatoes, yet that represents only 5.6 percent of the national production. The importance of the Cartago area is underestimated in Table III-1 since much of the production attributed to the province of San Jose comes from area on the slopes of the Irazu Volcano near the city of Cartago. It should be noted that while the areas northwest of the city of San Jose produce potatoes, it is not the primary crop of that region nor of its farmers.

From 1950 to 1973, potato production increased 195 percent from 153,520 cwt to 453,810 cwt.¹ Most of the increase came during the decade from 1953 to 1963. The reason for such a drastic change is most

¹Direccion General de Estadistica y Censos, Censo Agropecuario: 1973 (San Jose: MEIC, 1974); Idem, Censo Agropecuario: 1950 (San Jose: MEIC, 1952).

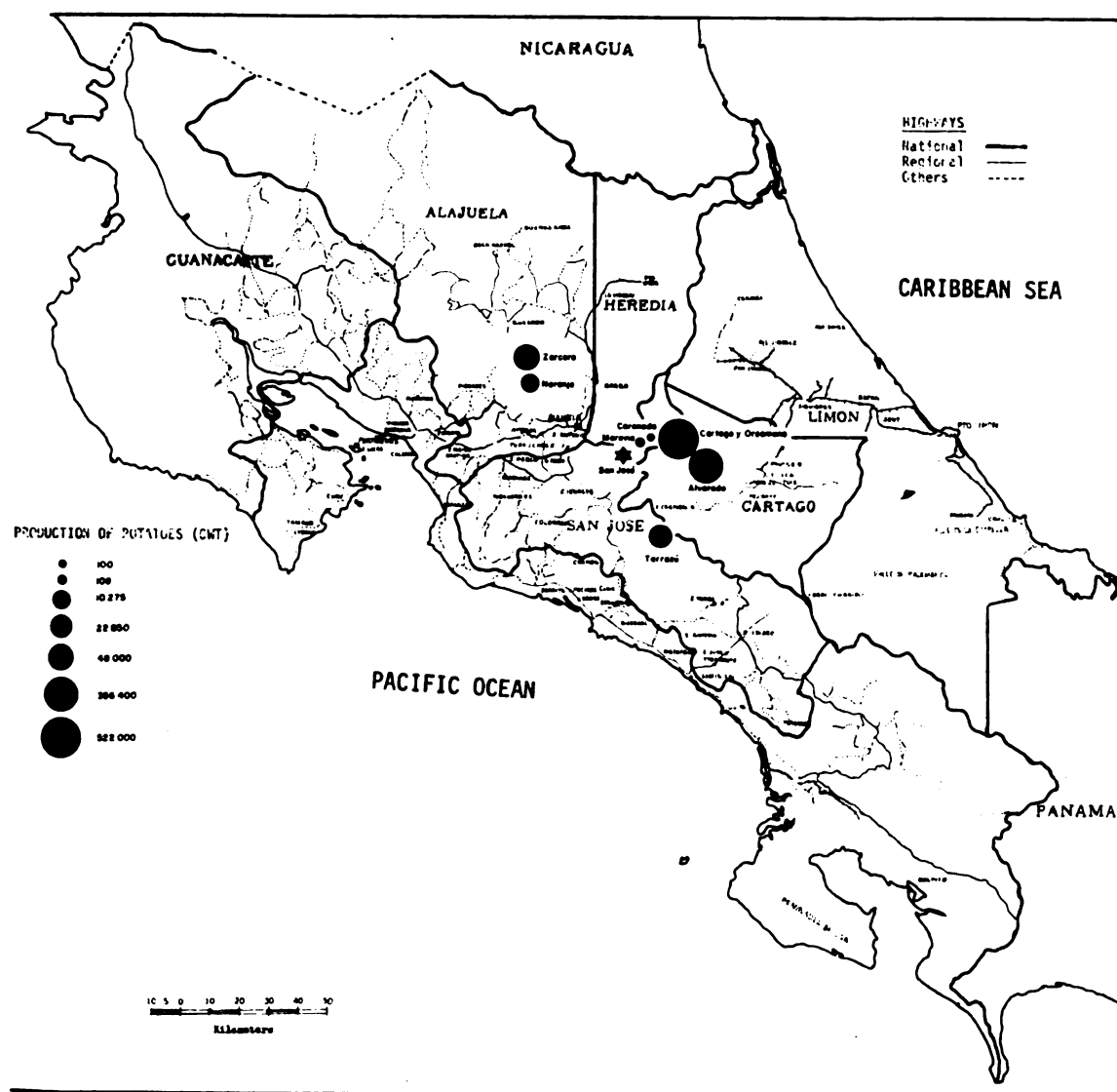


Figure III-1. Map of Costa Rica: Estimated Volume and Zones of Potato Production: 1972.

Source: Programa Integral de Mercadeo Agropecuario, San Jose, 1973.

Table III-1. Potato Production and Planted Area in Costa Rica by Province

Province	Number of Farms	Area Planted (hectares)	Production (kilograms)	Kilos per Hectare	Percent of National Production
San Jose	123	110.6	775,560	7,012.3	3.76
Aljuela	225	240.7	1,161,822	4,826.8	5.63
Cartago	584	1,618.9	18,576,594	11,474.8	90.08
Heredia	6	5.0	31,096	6,219.2	0.15
Guanacaste	20	15.8	46,966	2,972.5	0.23
Puntarenas	23	9.9	35,696	3,605.7	0.17
Costa Rica	981	2,001.1	20,621,734	10,305.2	

Source: Direccion General de Estadistica y Censos; Censo Agropecuario: 1973 (San Jose, MEIC, 1973).

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likely due to the introduction of a new potato variety accompanied by the eclipse of older traditional varieties. Many native varieties disappeared from the market during this period as the Atzimba variety from Mexico was brought to Costa Rica to replenish seed stock. As late as 1958, Green was able to report that the bulk of potatoes were produced from three native varieties.² By 1973 Atzimba accounted for 95 percent of the national production.³ The remaining potatoes are Rosita, a native variety, and some Kennebec.

The yearly production of potatoes from 1957 through 1973 is shown in Figure III-2. Until 1968, there was a steady increase in the amount of potatoes produced. After 1968, however, production declined, and it was not until 1972 that it was able to surpass pre-1968 levels. The exact reason for the decline in production is not known, but it was around 1969 that the pulilla, a worm that attacks the tuber, first appeared in Costa Rica.

Potatoes are planted and harvested every month of the year (Figure III-3), however, the major portion of the crop comes on the market twice a year from late August through early November, and again in March. The seasonality of potato production is related to climatic conditions. The rainy season begins in April-May and runs through October and sometimes into November. This allows farmers to plant at the beginning of the rains, and again at the end of the wet season. Since there is very little irrigation used in the cultivation of potatoes, an

²R. E. L. Greene, An Economic Study of the Production and Marketing of Potatoes in Costa Rica (San Jose: STICA/AID, 1958), p. 1.

³Luis Cartin, et al., Apuntes Sobre el Cultivo de la Papa en Costa Rica (San Jose: MAG, 1973), p. 2.

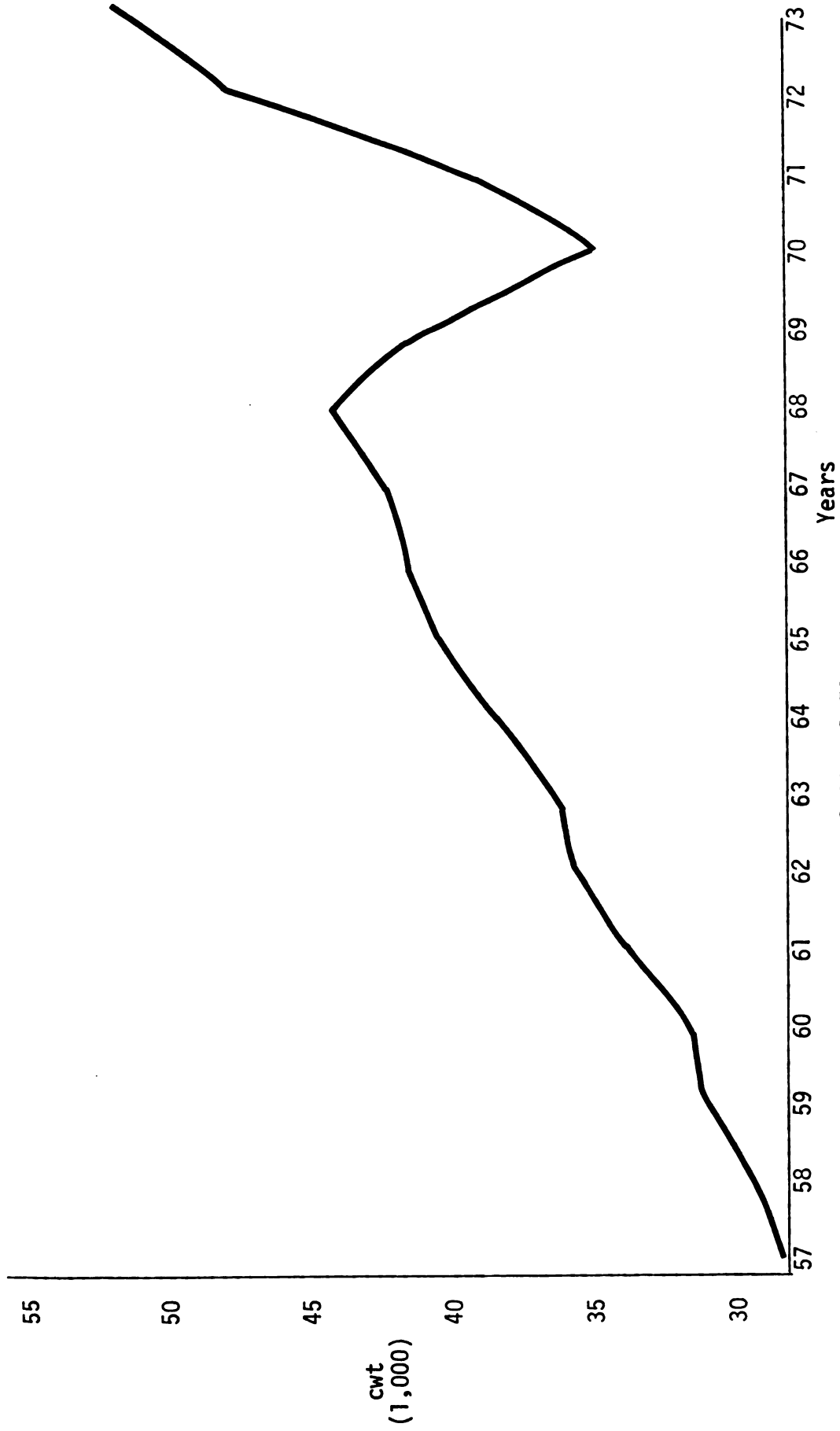


Figure III-2. Yearly Production of Potatoes: 1957 - 1973.

Source: Ministry of Agriculture, unpublished production records.

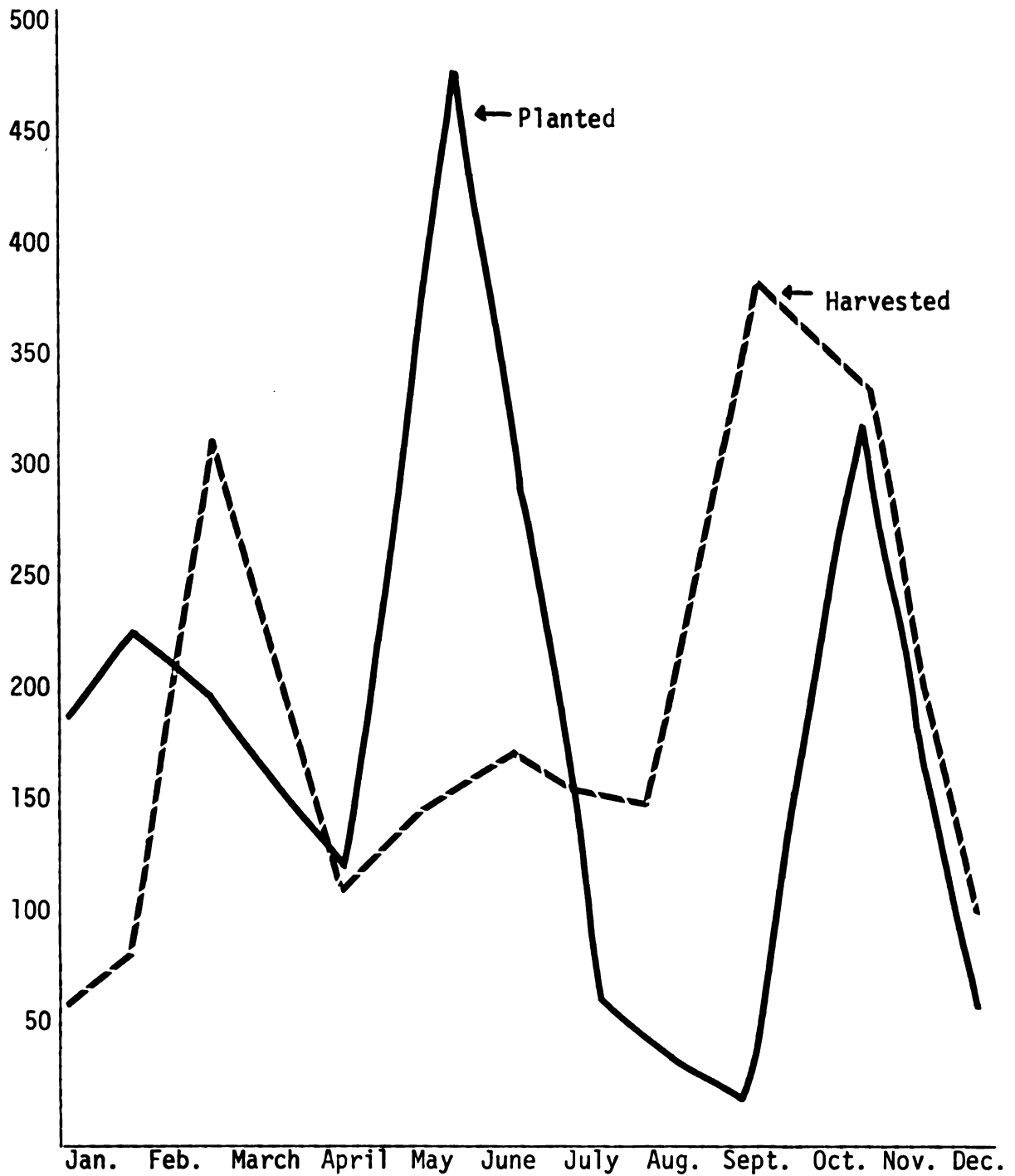


Figure III-3. Manzanas of Potatoes Planted and Harvested: 1974.

Source: Nelson Montero, presentation to Costa Rican National Congress, Cartago, October, 1975.

extended dry season will cause a large decrease in the supply of potatoes, resulting in large price fluctuations.

The normal growing cycle for the varieties used in Costa Rica is approximately 135-140 days,⁴ or 4½ months. The growing period will vary between micro-climatic areas in the Cartago region. Near the city of Cartago, potatoes are harvested in 3½ months, while in the highest areas the period between planting and harvesting can be extended to almost a year. In the other potato producing regions, northwest of San Jose, planting occurs in June and November, with harvesting coming between four and five months afterwards.

Potato Marketing⁵

Potato production in Costa Rica is a highly commercial farm enterprise. Most of the potatoes are sold on the cash market (79 percent). Losses, or potatoes of noncommercial quality account for seven percent of the total production, while 13 percent of the production is kept for seed stock. On farm consumption of potatoes is minimal, accounting for less than six-tenths of a percent of total production.

Every Sunday for two hours during the morning in the city of Cartago farmers and assemblers gather on a street corner to sell and buy potatoes. During this period both groups spend a good deal of time "feeling-out" the market. Farmers usually bring a small bag of potatoes which are supposed to represent a sample of their crops. On the basis of this sample the farmer and the buyer will come to an agreement

⁴Cartin, et al., p. 6.

⁵See Appendix A, Figure A-1 for the channel map of the Costa Rican potato distribution network.

on: 1) quantity; 2) price per carga (units of 1,800 pounds); and 3) the day in which the buyer will pass by the farm to pick up the potatoes. No money changes hands, nor are any contracts or other agreements signed. On the following Sunday in Cartago the assembler--having sold the potatoes during the previous week--will pay the farmer. It is often the case, however, that the price paid is lower than the price agreed upon the previous Sunday.

After picking up the potatoes on the agreed upon day, they are taken to be washed, sorted, dried and repacked in sacks of approximately 100 pounds.⁶ The potatoes then move either to San Jose or directly to one of many local markets. At no other place is the distribution channel so concentrated than at the assembly level. This concentration is reflected in the high percentage of available potatoes which are marketed and handled by a relatively small number of merchant middlemen at one location. San Jose wholesalers, on the other hand, are numerous, and handle smaller volumes than do the assemblers. Entry as wholesaler is difficult, and those who are trading in the marketplace are among the most traditional participants within the system.

From the San Jose markets potatoes move to secondary markets across the country--for wholesale or retail sales--or directly to rural store owners who will, in turn, sell them to rural consumers. Those consumers in San Jose, where the largest market for potatoes is concentrated, receive their potatoes for the most part from neighborhood stores. There are, nevertheless, a fair number of consumers who prefer to venture into the Borbon and San Jose market areas foregoing the convenience of the neighborhood store for lower prices.

⁶Assemblers receive potatoes in sacks of 180 pounds.

There is very little demand for potatoes other than for table-stock. Essentially, the only processed use for potatoes in Costa Rica is for chips. And, except for seeds, hardly any storage of potatoes takes place. Thus, almost all potatoes which are harvested move directly into the marketplace. The seasonality of production combined with both a lack of storage and alternative demand has resulted in large seasonal price fluctuations for potatoes.

Demand Factors

The potato is not an important element in the Costa Rican diet. Table III-2 compares per capita potato consumption in Costa Rica with Peru, Colombia, and the United States, countries of high per capita potato consumption. The main staple and source of calories in the Costa Rican diet is rice. Gonzalez and Hammock report that when the village of Tierra Blanca was settled in 1823 the main crops were corn, and later wheat. While potatoes were reported planted in the area in 1910, it was not until 1935 that potatoes were cultivated on a large scale.⁷ Based on conversations with farmers in other villages in the Cartago region, it appears that the history of Tierra Blanca is typical of the entire region, i.e., large scale potato production is a relatively recent phenomenon in the agronomic history of Costa Rica. Potatoes, therefore, have never been a traditional part of the Costa Rican diet. This appears, more than any other factor, to account for the limited per capita consumption of potatoes.⁸

⁷ Jose L. Gonzalez and John C. Hammock, Seis Comunidades Costarricenses (San Jose: DINADECO, 1973), p. 62.

⁸ Consumers do not appear to be very responsive to changes in potato prices. As will be seen below, demand is highly price elastic. Furthermore, compared with the price of potential substitutes (i.e.,

Table III-2. Per Capita Consumption of Potatoes in Costa Rica, Peru, Colombia, and the United States

Costa Rica ^a		Peru ^b	Colombia ^c	USA ^d
Urban (1974) (pounds)	All (1973) (pounds)	(1971) (pounds)	(1967) (pounds)	(1970) (pounds)
40.9	27	230.78	123.2	118.6

Sources: ^aDirección General de Estadística y Censos, Población de Costa Rica (San Jose: MECI, 1973); Agricultural Census Survey, unpublished data.

^bEric S. Graber, Potato Supply, Demand and Marketing in Central Peru, Paper No. 6 (Ames: Iowa State University, 211-d Grant Program, 1974), p. 21.

^cChristopher O. Andrew, "Improving Performance of the Production-Distribution System for Potatoes in Colombia" (Ph.D. dissertation, Michigan State University, 1969), p. 66.

^dKelly M. Harrison, Stephen O. Sparks, and M. Fabre, The Michigan Potato Industry: A Market Analysis (East Lansing: Department of Agricultural Economics, Agricultural Economics Reports No. 294, Michigan State University, 1976), p. 3.

Population

To examine changes in the consumption of potatoes over time, per capita production was calculated (Figure III-4). In 1957 per capita production averaged almost 28 pounds per person. By 1973 per capita production had decreased to less than 27 pounds per person. Even excluding the years between 1969-1971, which appear to be deviant observations, per capita production shows a downward trend. To estimate future trends in per capita production, equations for potato production

yuca, plantain, rice, and beans), potato prices increased at a slower rate between 1967-1974, yet consumption of potatoes did not appear to increase.



Figure III-4. Per Capita Production of Potatoes: 1957 - 1973.

Source: Ministry of Agriculture, unpublished production records; Direccion General de Estadistica y Censos, Poblacion de Costa Rica (San Jose: MECI, 1974).

and population growth were calculated.⁹ Using these equations to project production and population growth out to 1985 show that given present conditions per capita production will continue to decrease.¹⁰

The largest single market for potatoes is the city of San Jose. If this market is enlarged to include the urban areas of the Central Meseta (Central Plateau)--Alajuela, Heredia and Cartago, then this market includes approximately one half of all Costa Ricans, yet they account for 75.3 percent of potato consumption. With consumption being concentrated in the Central Meseta, its rate of growth as compared with the rest of Costa Rica is important to determine possible demand shifts. An equation was calculated to estimate Central Meseta

by: ⁹The production equation calculated for years 1957-1973 is given

$$\ln Y = 12.5143 + .16598 \ln X \quad R^2 = .74$$

where Y = Production in year i

X_i = year i

i = 58-73

by: The population equation calculated for years 1952-1973 is given

$$Y = -1871640.9 + 51682.389X_i \quad R^2 = .99$$

where Y = Population in year i

X_i = year i

i = 52-73

¹⁰For 1985 the estimated per capita production was 22.6 pounds per person. When per capita production was estimated excluding the years 1969-1971 it decreased, though by not as much, to 25.7 pounds per person.

population growth,¹¹ and then used to project population out to 1985. The 1985 projected Central Meseta population is 1,489,380 persons compared with the projected national population of 2,521,362 inhabitants--or 59 percent of the nation's population in the Central Meseta. This implies that if consumption and population patterns do not change, the demand for potatoes will increase faster than would be indicated by only the proportional rate of population growth.

Three reasons may explain the difference between the consumption levels of potatoes in the Central Meseta and the rest of the country. The first is that as potatoes leave San Jose the costs of marketing become very high. Besides the additional transportation costs, it must be remembered that potatoes, compared with rice or beans, are relatively perishable. Another reason for higher costs outside the Central Meseta is that rural store owners will often purchase from town retailers, adding another link to the marketing chain and raising the price to consumers. Finally, outside of the Central Meseta other root crops and plantains are locally grown. Besides holding a price advantage over the potatoes, they are traditionally consumed food items having wider consumer acceptance. As one moves to the higher and cooler Central Meseta area, potatoes are more readily available, of better quality and lower priced. Thus, consumption of potatoes becomes more feasible.

¹¹The equation calculated for years 1952-1970 was specified as:

$$\ln Y = 2.586 + 2.617 \ln X_i \quad R^2 = .99$$

where Y = Population in year X_i

X_i = year i

i = 52-70

Income

Another factor which may result in increased potato consumption as the population relocates in the urban Central Meseta is that incomes are higher in that area, and it appears that up to a point potato consumption is income elastic. Cespedes estimated the national per family income at ¢1175 (\$138) per month, yet when comparing rural and urban areas, the monthly per family incomes were ¢796 (\$93) and ¢1,239 (\$199) respectively.¹² While the income level is higher in the urban area, it is not the result of a concentration of wealth in the hands of a few very rich urban dwellers. In the rural areas 77 percent of the population have monthly incomes of less than ¢200 (\$23) compared with only 32 percent of the urban population in that category. Thus urban residents, in general, have higher incomes than rural residents.

The families interviewed by the Costa Rican Statistics and Census Bureau were divided into seven groups separated by ¢1,000 (\$117) increments in income. This made it possible to conduct a cross sectional income consumption analysis. It is recognized that there are limitations with this type of analysis when used for policy purposes. The basic underlying assumption is that as a person shifts from one income level to the next he will adopt behavioral patterns associated with the new group. This ignores: 1) the possibility that as one's income changes his socio-economic status may not change; 2) the effect of changes on price as large numbers in the population shift income levels; and 3) the time it will take one to adjust to the new income

¹²Victor Hugo Cespedes, Costa Rica: La Distribucion del Ingreso y el Consumo de Algunos Alimentos (San Pedro, Costa Rica: Universidad de Costa Rica, 1973), p. 51.

level.¹³ The information gathered from such analyses must, therefore, be applied with care. While it will be impossible to exactly predict consumption based on changing income levels, it will nevertheless provide an insight into the relationship between the two variables.

Table III-3, and Table III-4 show the relationship between weekly per family consumption and income. As the income level increases consumption also increases, although not as fast. The increase in per family consumption continues until the 3,000-4,000 colon (\$351-\$468) per month income level at which point it levels off, and then begins to fall for the highest income group. As income increases the per family consumption as well as the percentage of those in the population consuming potatoes will slowly increase. Throughout this range potatoes can be thought of as superior goods, and only with the highest income earners does it become an inferior good. Table III-4 gives the arc elasticity calculated at the mid-point for each group.

If potatoes are a superior good over an income range that encompasses 95 percent of the population, this would imply that changing income levels may, in turn, influence demand. It was calculated that real per family income will increase yearly by ¢8.98 (\$1.05).¹⁴ This would mean, ceteris paribus, that total consumption would increase by

¹³Lester V. Manderscheid, "Some Observations in Interpreting Measured Demand Elasticities," Journal of Farm Economics 46 (February, 1964): 130.

¹⁴A trend line was estimated for real per capita income for the years 1958-1973:

$$Y_i = -91.1703 + 1.76 X_i \quad R^2 = .58$$

where Y_i = real per capita income in year i

X_i = year i

Table III-3. Percent of the Urban Population Consuming Potatoes, Percentage of Total Urban Consumption and of Expenditures on Potatoes for 1974 by Income Levels

Income Level (Colones)	Percent of Sample Population	Percent of Group Consuming Potatoes	Percent of Total Consumption	Percent of Total Expenditures
0-1000	25.1	70.2	16.9	16.9
-2000	34.2	82.9	34.4	33.9
-3000	17.2	84.0	20.3	20.3
-4000	9.1	87.0	11.7	12.0
-5000	4.8	86.3	5.9	5.7
-6000	2.8	86.8	3.7	3.6
6001 and above	6.9	80.2	7.2	7.7

Source: Costa Rican Statistics and Census Bureau Survey, 1974.

Table III-4. Arc Elasticity and Per Capita Consumption for 1974

Income Level (Colones per month)	Per Family Consumption (pounds per week)	Arc Elasticity ^a
0-1000	2.71	.396
-2000	4.05	.318
-3000	4.75	.266
-4000	5.19	-.278
-5000	4.89	.346
-6000	5.24	-1.350
Above 6000	4.18	

Source: Costa Rican Statistics and Census Bureau Survey, 1974.

^aThe formula used to calculate arc elasticity was:

$$\frac{\Delta Q}{\Delta I} \times \frac{(I_2 + I_1)/2}{(Q_2 + Q_1)/2}$$

where: Q = quantity
I = income

about .7 percent per year. These calculations are based on the assumption of a completely equal distribution of the increased income. Cespedes, however, found that between 1961 and 1971 income was redistributed downward. This implies that consumption would increase by even more than seven-tenths of a percent. What may be concluded, therefore, is that with respect to potato consumption there appears to be growing market in Costa Rica.

Price Elasticity

The final component of demand relates the quantity consumed to the market price, i.e., price elasticity. Again data provided by the Statistics and Census Bureau were used to try to estimate the price elasticity of demand for urban families. Observations of the market by the author as well as conversations with knowledgeable participants within the system pointed to the fact that there were no special periods during the year when potatoes were in greater demand. Without a seasonality in the demand for potatoes, the demand curve can be assumed fixed with differences in price due to the changing supply of potatoes on the market. This allows the demand curve to be identified using quantity and price observations.

Using the monthly prices and per family consumption from the Statistics and Census Bureau survey, presented in Table III-5, a demand function was estimated and price elasticity of demand found to

Table III-5. Percent of Urban Families Consuming Potatoes Per Family Consumption and Price of Potatoes per Average Week per Month for 1974

Month ^a	Percent of Families Consuming Potatoes	Per Family Consumption (pounds)	Price per Pound (colones)
1	76.6	3.3	1.49
2	80.1	3.5	1.54
3	78.2	4.2	1.42
4	79.0	4.0	1.32
5	77.7	3.8	1.16
6	81.7	4.5	1.00
7	80.4	3.9	1.06
8	81.1	3.9	1.04
9	83.8	4.3	.88
10	76.4	4.3	.83
11	84.3	4.1	1.03
12	79.1	4.5	1.14
13	83.3	4.0	1.21

^aThe year was divided into 13 months of 4 weeks each.

Source: Costa Rican Statistics and Census Bureau Survey, 1974.

be high inelastic.¹⁵ In periods of over-supply falling prices did not generate much more urban per family consumption. The percentage of

¹⁵Elasticity was calculated from the following demand equation:

$$Y = 5.24 - 1.05 X_i \quad R^2 = .44$$

where Y = per family consumption
 X_i = Price in month i

urban families that consumed potatoes also remained fairly constant--close to 80 percent. Thus, lower prices due to seasonal variation in production did not induce more urban families to consume potatoes, rather, the "excess" supply moved out to the rural areas as prices dropped enough to encourage wholesale truckers to handle potatoes.

Processed Potatoes--Trends and Consumption

Two types of processed potato demand are identified. The first may be convenience food demand. This would include frozen, dehydrated, or canned potatoes whose form has been changed in order to: 1) prolong the life of the product; and most important, 2) to facilitate the preparation of the product by the consumer. As of October 1975 there were only three companies involved in this type of potato processing. In all three cases, processed potatoes represented just one of many products that they handled. The amount of potatoes destined for this use was 3045 cwt in 1974, representing 21 percent of the total processed potatoes, and .7 percent of the total 1974 potato consumption.

By processing potatoes in a convenience food form a service is provided to the consumer. The production of this service has a cost which is incorporated into the price of the product. The group which may constitute a market for convenience foods is women between the ages of 15 and 60 who, because of study or work, are outside the home most of the day. Of the total female population in this age group, excluding domestic help, only 23 percent are studying or working. Of this figure it is not known how many are responsible for preparation of meals--although it is considered to be small--thus this market segment is also very limited. It should be pointed out, however, that the

Setting X and Y at their mean values the elasticity was equal to -.3.

structure of Costa Rican society has been changing as more women are incorporated into the labor force. As their numbers increase, so will the demand for convenience foods, since: 1) they will have a higher income; and 2) they will be willing to pay for the service of pre-prepared food.

The second form of processed potatoes are those destined for the snack food market. Production of potatoes for snack foods is almost exclusively potato chips, although there is one company manufacturing potato sticks for export within the Central American Common Market. Nine companies were identified that manufactured potato chips. Besides these companies, there are very small scale manufacturer-retailers of potato chips operating in San Jose. They usually occupy the front corner of restaurants located near bus stops. They fry the potatoes on the spot, then sell them in small paper bags. Sometimes they also manufacture and sell taco chips.

The position of potatoes in the snack food market has diminished in recent years.¹⁶ While it is not known exactly why snack food consumption of potatoes has declined, it is considered to be due to the introduction of other snack food products in the Costa Rican market. These have usually been corn products manufactured by companies operating throughout the Central American Common Market, and introduced into the Costa Rican market by means of extensive advertising campaigns.

Additionally, the declining market may also be due to the nature of the potato chip industry itself. Quality control of potato chips, beginning with the selection of the potato, is minimal. Potatoes are not

¹⁶Interview with Ing. Abel Coto, Planning Office, Costa Rican Ministry of Agriculture, San Jose, 8 August, 1975.

grown especially for chip use--rather it is often the culls which are used for potato chip manufacturing. This results in a product whose size and taste vary from lot to lot. Potato chips are packaged in clear plastic bags which do not offer the same protection that paper bags provide. Thus, the lack of alternative snack food uses for the potato and the poor quality of the potato chips already on the market have resulted in the decline in potato snack food consumption, especially in the face of increased competition from other products.

Trends. To determine changes in the uses of processed potatoes, a 1972 study on the industrial use of fruits and vegetables¹⁷ was updated to 1974 for potatoes. New processors--i.e., those who had initiated operations since 1972--were questioned as well as those manufacturers identified in 1972 as potato processors who were still operating. Industrial use of potatoes for processing dropped from 24,882 cwt in 1972 to 14,474 cwt in 1974. The large decline between the two years (41.8 percent) in the amount of processed potatoes¹⁸ suggest that either: 1) there was an error in the data collection procedure; 2) the processed potato industry, as it now exists, is passing through a period of contraction; and/or 3) there were other factors which resulted in a temporary reduction in the output of processed potatoes. While the first possibility cannot be ruled out, it is considered that there has been a reduction in the volume of processed potatoes on the market.

¹⁷Carlos Cervantes and Roy McDonald, Consumo Industrial de Frutas y Hortalizas en Costa Rica durante 1972 (San Jose: IFAM-PIMA, 1973).

¹⁸As a percentage of total potatoes entering the market, it declined from 5.9 percent in 1972 to 3.2 percent in 1974.

The reduction in processed potatoes is probably due to a combination of short-run economic factors and a long-run decline in the popularity of potatoes as a snack food. Between 1972 and 1974 the consumer price index rose from 121.42 to 181.96 (1964=100). Since most of the processed potatoes are for the snack food market, when the general price level rises expenditures on snack foods will be temporarily reduced until the previous real income level is restored.¹⁹ Over the long-run, the trend in the snack food industry has been away from potato chips. Between 1972 and 1974 the number of potato chip manufacturers remained constant at nine, yet two companies ceased manufacturing while two new companies began operations. The potato chip manufacturers were asked if they planned to use more potatoes in 1976. Only one answered that he would expand output--increasing it by about 20 percent. Two answered that they would reduce output--one by about 44 percent, the other would not give a figure. Two other manufacturers, however, reported that they were in the process of closing down.

Compared with the decrease in potato chip demand, the use of potatoes in other processed forms appears to be slowly growing. Of the three nonsnack food firms processing potatoes, one planned to reduce purchases of potatoes by three percent in 1976, while one expected to increase the use of potatoes but would not give a figure. Although nonpotato chip demand is increasing, the entire processed potato industry, due to the importance of potato chips, is going through a period of decline.

¹⁹This assumes that tastes as well as other variables will not change during this interim period.

Other Forms of Potato Demand

Two other types of demand for potatoes are identified: 1) governmental, and 2) restaurant. Of these, the governmental demand is the most important. The National Production Council (CNP) purchases 6.7 percent of the potatoes that are traded on the San Jose market; these potatoes are then redistributed in their retail outlets located primarily in rural and poor urban areas. Additionally, in 1975 the government of Costa Rica was negotiating a loan from the United States Government to finance the development of a nutrition program. As this is operationalized the Costa Rican Government will be entering the market to purchase large quantities of food, including potatoes, to be used for this program.

The demand for potatoes served in restaurants is growing. There is one fast-food chain, for example, that used 3,000 cwt. of potatoes in 1974, and plans on using even more in 1976. As the urban areas grow in size and more offices change from a two-hour lunch to a 45 minute lunch period, the demand for restaurant meals will increase. Presently, most of the potatoes served in restaurants are french fried. Occasionally potatoes will also be mixed with meat and beans, or served boiled and sliced. Other forms of serving potatoes, e.g., baked and mashed, are seldom seen. Thus, there are different ways of serving the potato which could become widely accepted which could increase restaurant demand. It is also probable that the development of a frozen or a dehydrated potato product would result in more potatoes being served, since this would eliminate some of the restaurant owners' problems associated with serving potatoes: 1) loss, 2) waste, and 3) labor involved in peeling and preparing potatoes.

Summary

Potatoes are not a staple in the Costa Rican diet; annual per capita consumption being only around 27 pounds. The low per capita consumption is probably due to the fact that large scale potato production only began in the mid-1930's. Thus, the potato is not considered as part of the traditional Costa Rican diet. Furthermore, consumption of potatoes in processed form is minimal.

The consumption of potatoes is concentrated in the urban areas of the Central Meseta. Since potatoes are income elastic, consumption of potatoes is lower in the relatively poorer areas outside the Central Meseta. High marketing costs, making potatoes more expensive, and the fact that other root crops are locally grown and consumed serve to further limit consumption outside the Central Meseta. It appears that most of the rural consumption of potatoes is during periods of large supply, although the CNP handles potatoes all year. The continued growth in population and migration to the urban Central Meseta, along with rising real per capita income, suggests that the total demand for potatoes should be increasing. Potato production, however, does not appear to be rising in response to possible increased demand. In fact, per capita production appears to be slowly decreasing.

Although per family consumption is low, potatoes are widely consumed in urban areas--around 80 percent of the families eat potatoes throughout the year. The urban demand for potatoes is highly price inelastic. Since potatoes move into the rural market in relatively large quantities when prices are very low, this suggests that the potato demand curve is kinked. That is, the potato demand curve is inelastic over a range representing urban demand until the price is low enough to

induce rural consumption, at which point the demand curve becomes more elastic. It will be seen that this demand situation will work against small farm agriculture, and yet this situation is partially the result of the institutional framework for trade which characterizes the SFSS.

CHAPTER IV

POTATO PRODUCTION AND PRODUCER CHARACTERISTICS

Production

The Cartago Region

The area around Cartago is one of the most important vegetable producing regions in Costa Rica. In addition to potato production, national carrot and beet production are also highly concentrated in the region. There is some specialization, but most of the production of these crops is by potato growers. Cartago is also one of the important dairy regions of the country. Most of the herds are found on the larger farms--82 percent on farms of 10 hectares or larger. While many of the larger potato producers also have dairy cattle, rotating land between pasture and production, there are also highly specialized dairy operations in the region.

In the Cartago region, potatoes are planted at altitudes ranging from 1400 to 2800 meters. Temperatures vary throughout the area. The lowest temperature at different locations range from 37°F to 52°F while the highest temperatures run from 51°F to 73°F. Average rainfall also varies substantially from one location to another within the region going from 1565 mm to 2418 mm.¹ The effect of these variations has been to create numerous microclimates throughout the region, causing the growing time to vary according to the location of the planting.

¹Ministry of Agriculture, Meteorological Service, daily records.

Numbers and Size of Potato Farms

Potatoes are grown in Costa Rica on 980 farms ranging in size from less than one half to over 100 manzanas. The number of farms has increased from 729 in 1950, with most of the increase being in the category of farms less than 10 manzanas (Table IV-1). Whereas in 1950, these smaller farms represented 45 percent of the total farms, they now represent almost 65 percent, accounting for a third of the production. The trend appears to be towards: 1) more smaller farms (10 manzanas or less); and 2) consolidation of the larger farms (100 manzanas or larger) at the expense of the intermediate size production units. The decline in number and in importance of the intermediate size farms suggests that existing technologies of potato production favor the extreme size farms, i.e., small and large farm operations. On one hand, small farms can make extensive use of family labor, with the occasional hiring of part-time labor and/or oxen. Only 27 percent of the small farmers own oxen and less than five percent employ full time laborers. Large farms, on the other hand, are able to extensively utilize oxen and full-time labor--88 percent of the large farmers own oxen and 59 percent employ full-time help.

The average area planted per farm has not varied much since 1950 (Table IV-2), yet average yield has doubled. These averages, however, tend to obscure the fact that the largest farms are planting more while the rest of the farms have more or less continued to plant the same area. In 1963, the larger farmers planted 7.4 percent of the total area, while in 1973 the area planted by these farmers increased to 9.9 percent of the total land in potatoes. Furthermore, they increased average annual yields by 59 percent compared with a 34 percent increase by the smallest farms.

Table IV-1. Number of Farms, Production, and Production per Farm of Costa Rican Potato Farms, 1950, 1963, 1973, by Farm Size

Size of Farm (manzanas)	1950 ^a			1963 ^a			1973 ^a		
	Number of Farms	Production (cwt)	Production Per Farm	Number of Farms	Production (cwt)	Production Per Farm	Number of Farms	Production (cwt)	Production Per Farm
0 - 10	329 (45.1)	30,219 (19.7)	91.9	355 (47.4)	91,188 (25.2)	256.9	634 (64.7)	152,117 (33.5)	236.6
- 50	252 (34.6)	60,256 (39.3)	239.1	269 (36)	146,826 (40.5)	545.8	234 (23.9)	156,069 (34.4)	666.9
- 100	81 (11.1)	32,270 (21)	398.4	79 (10.6)	80,226 (22.1)	1015.5	67 (6.8)	45,352 (10)	676.9
Greater than 100	67 (9.2)	30,775 (20)	459.3	45 (6)	44,028 (12.2)	978.4	45 (4.6)	100,241 (22.1)	2278.0
Total Costa Rica	729	153,520	210.6	748	362,268	484.3	980	453,810	463.1

^aNumbers in parentheses represent percents of column totals.

Source: Direccion General de Estadistica y Censos, Censo Agropecuario: 1950 (San Jose: MECI, 1952); Idem, Censo Agropecuario: 1963 (San Jose: MECI, 1965); Idem, Censo Agropecuario: 1973 (San Jose: MECI, 1974).

Table IV-2. Potato Yields and Average Area Planted in Costa Rica:
1950, 1963, 1973

	1950 ^a	1963 ^b	1973 ^c
Production/Manzana (cargas)	4.1	8.1	8.8
Average area planted (manzanas)	2.8	3.3	2.9

Sources: ^aR. E. L. Greene, An Economic Survey of the Production and Marketing of Potatoes in Costa Rica (San Jose: STICA/AID, 1958).

^bDireccion General de Estadistica y Censos, Censo Agropecuario: 1963 (San Jose: MECI, 1965).

^cIdem, Censo Agropecuario: 1973 (San Jose: MECI, 1974).

Land area. Over the period from 1950 to 1973 the total land area in Costa Rica devoted to potato production grew by 37 percent, from 1457 hectares to 2001 hectares. Comparing the period from 1950 to 1963 with that of 1963 to 1973, the average increase in land area per year in the two periods were 21.2 hectares and 26.8 hectares, respectively.² While it is not known exactly why the yearly average addition to the area under production has increased, it is probably due to the need to use more land as: 1) the quality of seed stock deteriorates; and 2) more marginal land is diverted into potato production. Most of this increase (87 percent) has been in the province of Cartago, and except for the province of Alajuela, the number of hectares in potato production in the rest of Costa Rica has decreased.

²Direccion General de Estadistica y Censos, Censo Agropecuario: 1973 (San Jose: MECI, 1974); Idem, Censo Agropecuario: 1950 (San Jose: MECI, 1952).

Land tenure. Most potato farmers own their own land--85 percent. For those who do not own land or wish to expand the area under cultivation they may rent land or enter into a crop sharing arrangement. Only 17 percent of the farmers rent land while 54 percent are involved in some form of share cropping. With regard to share cropping, usually one farmer will put up the seeds and the other the land. Beyond that, various arrangements are made for labor and other input costs. Often the owner of the land will also prepare it for planting, and from then on the costs are shared. When the potatoes are sold, the profits are also shared. The term for this type of arrangement is a medias for "halving." Generally, when it occurs, it is the larger farmer who puts up the seeds, and the smaller farmer who gives the land. This is one means by which the large farmer is able to plant in many different micro-climatic areas.

Inputs

Machine and animal power. Almost all of the potatoes are planted and harvested using manual labor and oxen. Tractors, however, are used in clearing and preparing the land for planting. It is estimated that almost 40 percent of the land is prepared by the use of tractor.³ While all tractors are owned by large farmers, they often rent them out at a fixed rate per land area. Oxen are used for land preparation and also for transportation. Many farmers own a pair of oxen, but they are also available for renting at a fixed rate per day.

³Kenneth Shwedel and Victorino Elizondo, Estudio de Mercadeo de la Papa en Costa Rica y Posibilidad, Utilidad y Viabilidad de la Union Regional de Cooperativas de la Provincia de Cartago (San Jose: INFOCOOP/AID, 1976), p. 36.

Chemical inputs. The use of chemical inputs is very widespread. Fertilizers, herbicides, fungicides and insecticides are used throughout the growing period. Before harvesting, the farmer has the option of accelerating the harvest by cutting the potato vines or applying defoliants. The use of chemical inputs is increasing. This is due to: 1) a common opinion held by growers that larger quantities of fertilizer can compensate for the lower productivity of poor seeds; and 2) the invasion in the late 1960's of potato fields by the polilla. Overall input prices have doubled between 1972 and 1975, however, it appears that as of early 1976 prices have stabilized and in some cases fallen.⁴ It is still too early to determine the long-run effects on potato production from the increased input price level.

Seeds. Costa Rica, at this time, has no national certified potato seed industry. The practice has been to import seeds and save part of the production from one planting to the next. Continued importation of seed stock has allowed production to increase over the last 23 years. When importation has been restricted, growers have relied on inferior domestic farm-produced seeds. Presently, this is the situation in Costa Rica. Importations have been restricted due to certification difficulties. The domestic seed stock is limited and quality is poor. This has produced shortages of potatoes in the market and increases in the price of seed.

Costs

Production costs of potatoes may be divided between: 1) material costs, 2) labor costs, and 3) other costs. The overwhelming percentage

⁴Tierra Blanca Cooperative, Input Supply Division, purchase orders, 1972-1976.

of potato production costs originate with the materiel costs, and of these seed costs are the most important expenditure (Table IV-3). Since Costa Rica does not have a national certified potato seed industry, besides importing seeds, farmers will save part of the production as seeds from one planting to the next.⁵ This creates a problem as seeds need to be stored under proper conditions and chemically treated to prevent sprouting. Losses in seeds stored run from an average of 6.5 percent for large farmers to 8.3 percent for small farmers. While storing the seeds is widely practiced, it is more often the large farmer who stores potatoes--88 percent of the large farmers store potatoes for planting compared with 59 percent of small farmers. Those potatoes which the large farmer does not plant on his land are used in crop-sharing arrangements and/or sold to other farmers. Comparing the rate of seeding per manzana (Table IV-4), one reason for greater use by small farmers may be that purchased seeds are inferior to those retained by larger farmers.

The fact that seeds may either be purchased from another farmer or be retained from one planting to the next raises the question as to the price for retained seeds: 1) they may be valued at the average purchase price for seeds in the region, or 2) they may be valued at a price which reflects the cost of storage from harvest to planting. In Table IV-6, the effects of the two alternative seed prices on total costs are compared. It was decided to use the first price alternative which will be referred to as "retail price." It is considered that the farmer has the option of either selling the seeds or using them on his

⁵The domestic seed stock is limited and of poor quality; thus, when importation of seeds have been restricted, there have been shortages of potatoes in the market and increases in the price of seeds.

Table IV-3. Cost of Materiel, Transportation, and Land per Carga Harvested for Small and Large Farms

Item	Small Farms (colones)	Percent of Total Cost per Item	Large Farms (colones)	Percent of Total Cost per Item
Fertilizer	298.57	30.4	288.66	35.0
Insecticides, herbicides, etc.	33.61	3.4	29.21	3.5
Liquid fertilizer	13.34	1.2	8.40	1.0
Seed	582.68	59.3	445.35	54.0
Transportation ^a	8.13	.8	3.87	.5
Land	46.74	4.8	49.57	6.0
Total	983.07	100.0	825.06	100.0

^aCost of transporting materiel from place of purchase to place of planting.

Source: Farm level survey for this study.

Table IV-4. Fertilizer and Seed Use, by Farm Size

Size	Fertilizer (cwt per manzana)	Fertilizer (cwt per carga)	Seed (carga of seed per manzana)	Seed (carga of seed per carga harvested)
Small	28.26	2.3	3.16	.26
Large	30.97	2.5	2.08	.17

Source: Farm level survey for this study.

own land. Thus, each carga of seeds has an opportunity cost to the farmer equal to the retail price of those seeds.

The next largest expenditure is for fertilizer. Most of the fertilizer is purchased from the cooperatives in the area, or from

Table IV-5. Man-days for Potato Production Activities per Carga Harvested for Small and Large Farmers

Activity	Small Farms (man-days)	Percent of Total Man-days per Activity	Large Farms (man-days)	Percent of Total Man-days per Activity
Clearing and Preparation of Land	4.62	30.8	1.75	17.6
Planting	1.38	9.2	1.26	12.7
Listing	1.28	8.5	.63	6.3
Applying Insecticides, Liquid Fertilizer, Etc.	1.68	11.2	1.46	14.7
Cutting Vains	.47	3.1	.28	2.8
Harvesting ^a	5.55	37.0	4.55	45.8
TOTAL	14.98	100.0	9.93	100.0

^aIncludes selection of potatoes.

Source: Farm level survey for this study.

distributers in Cartago. Small farmers as a result of the effectiveness of production cooperatives in the area pay approximately the same price as large farmers, \$93.10 and \$95.35 per cwt, respectively, for their fertilizer.

With respect to other input and transportation costs, prices to both groups are also approximately equal, rather it is the intensity of use that varies. Large farmers use a wider range of insecticides, herbicides and defoliant while small farmers use greater amount of liquid and granulated fertilizer. Small farmers pay more in transportation costs because: 1) they purchase more seeds which are costly to transport; and 2) large farmers receive quantity discounts from truckers.

Table IV-6. Potato Production Costs per Carga Harvested Under Different Family Labor and Seed Cost Assumptions for Small and Large Farms

Size of Farm	Free Family Labor Wholesale Seed Costs (colones)	Free Family Labor Retail Seed Costs (colones)	Paid Family Labor Wholesale Seed Costs (colones)	Paid Family Labor Retail Seed Costs (colones)	Variable Family Labor Wholesale Seed Costs (colones)	Variable Family Labor Retail Seed Costs (colones)
Small	1042.13	1122.09	1195.96	1275.91	1146.89	1226.85
Large	907.26	994.88	994.66	1052.29	946.35	1033.98

Source: Farm level survey for this study.

Small farms use more labor than large farms (Table IV-5). Much of the labor for small farms comes from the family as opposed to hired labor. To compare family labor use to hired labor use for the large and small farmers, a ratio was constructed of hired to family labor per manzana. For the small farmers, there are 1.15 hired laborers for each family worker, while for the large farmers there are 2.47 hired laborers for each family worker.

The relative importance of family labor in the production of potatoes raises the problem of how to value that labor in the cost calculations. For the purpose of constructing a budget statement, three alternative price assumptions were considered for family labor: 1) family labor was considered to be free to the farmer, 2) family labor was priced at the existing wage rate in the region, and 3) family labor in slack periods was given a zero value while family labor used during key periods in the production process (planting and harvesting) was valued at the full wage rate--i.e., a weighted average price based on the percentage of work performed during key periods.⁶ The difference in total costs per manzana under each of these assumptions as well as those assumptions referring to seed costs, discussed above, are shown in Table IV-6. Throughout the remainder of this study, the third price alternative will be used and referred to as "varying family labor costs." It is considered that this alternative realistically reflects the situation confronting the farmer. Table IV-5 appears to confirm this selection: small farmers, compared with large farmers, use more labor,

⁶Pan A. Yotopoulos and Jeffrey B. Nugent, Economics of Development: Empirical Investigation (New York: Harper & Row Publishers, 1976), p. 83.

of which a larger component is family supplied, during slack periods, i.e., when labor costs are lowest. When family labor has an opportunity cost equal to the effective wage rate, small farms use proportionally less labor than is used by the large farmer.

Comparing the production costs under different input cost assumptions (Table IV-6), the small and large farmer costs are very close. There was no difference between the costs for the two groups at the .05 level of significance, under any of the alternative seed or labor cost assumptions.

Average cost of production functions were calculated for all of the growers and for each group separately. The functions, presented in Table IV-7, were examined to determine whether small and large farms operate along different cost functions.⁷ The results showed that the small and large farmers were operating along two different cost functions indicates that they are operating at two different scales of production.

Comparing the two production functions over a large range (Figure IV-1), small farmers are able to produce potatoes at a lower per unit cost. Small farmers, therefore, have the potential to supply potatoes

⁷This was done by comparing the sum of squares of the residuals of the separate cost functions for each level of operation with the difference between the sum of squares of the residual of the function for all farms:

$$SS_{\text{difference}} = SS_{\text{all farms}} - (SS_{\text{small}} + SS_{\text{large}})$$

An F statistic is calculated by taking the ratio of $SS_{\text{difference}}$ deflated by the additional degrees of freedom, to $SS_{\text{small}} + SS_{\text{large}}$ deflated by the sum of the degree of freedom. If there is a difference between the two functions, the $SS_{\text{difference}}$ will be large as $(SS_{\text{small}} + SS_{\text{large}})$ becomes smaller. William Mendenhall, Introduction to Linear Models and the Design and Analysis of Experiments (Belmont, Ca.: Wadsworth Publishing Co., Inc., 1968), pp. 176-179.

Table IV-7. Farm Level Average Potato Cost Functions per Carga Harvested for Small and Large Farms^a

Size	A ^b	B ^b	R ²
Small Farms	6.57 (.21)	2.75 (1.2)	.21
Large Farms	6.48 (.11)	14.86 (3.6)	.54

^aThe functional form used was:

$$\ln Y = A + B/X$$

where: Y = cost per carga
X = cargas harvested

^bStandard error in parentheses.

Source: Farm level survey for this study.

at a lower cost than are being presently supplied by large farmers. It will be shown in subsequent chapters, however, that when the costs of marketing activities are taken into consideration, the level of small and large farm production approaches a sub-system equilibrium level of output and that the LFSS is able to produce and market potatoes at a lower cost.

Yield

Average yield on small and large farms is equal to 12.2 cargas (219 cwt) and 12.6 cargas (227 cwt) per manzana, respectively. Per farm production is equal to 14.4 cargas and 60.6 cargas for small and large farms respectively. Classifying output⁸ by: 1) first grade--those

⁸It is recognized that this classification is very subjective, allowing for a large range of potatoes falling between first and refuse, however, it is the one used by participants in the system.

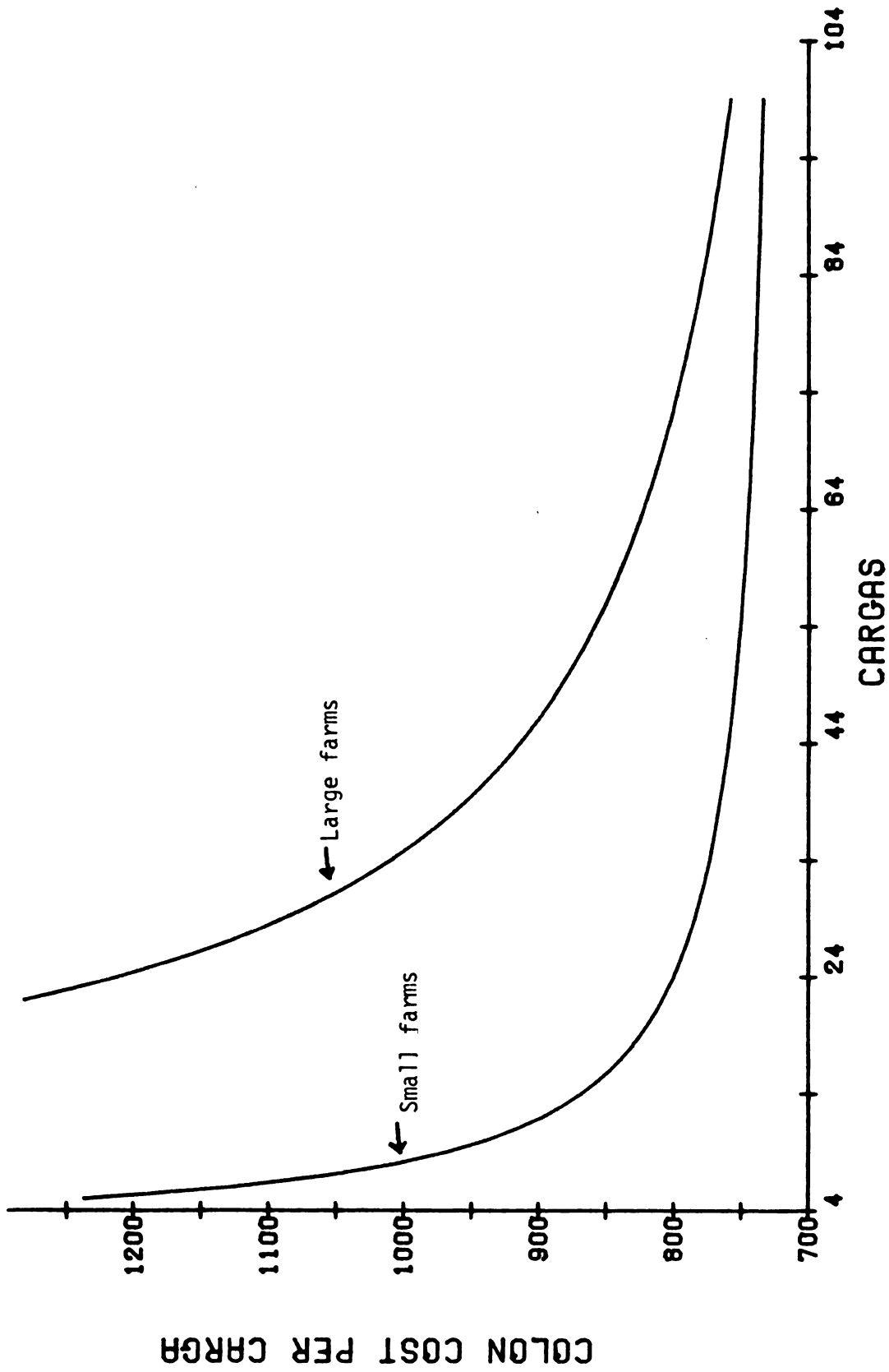


Figure IV-1. Farm Level Average Cost Curves

Source: Table IV-7.

potatoes fairly large and relatively free of deformities, 2) seconds--small potatoes and/or those which are highly damaged or deformed;⁹ and 3) seeds--potatoes which are stored from one period to the next. Large farmers are losing fewer potatoes (Table IV-8). This benefits the large farm with respect to their profit statement, first as a return from more sales, and second as an asset in the form of potato seeds. These seeds, as stated above, are then used for the next production period; they may also be sold to other farmers, or used as part of a crop-sharing arrangement.

Table IV-8. Classification of Potato Production by Grade and Farm Size

Size of Farm	First Grade (percent)	Second Grade (percent)	Seed (percent)
Small	64.0	12.3	23.7
Large	65.5	9.8	24.7

Production Decision

It would be expected that changes in productivity would be highly correlated with price movement, but when price is unknown, or highly variable to the point that probabilistic parameters are almost meaningless, other decision-making rules are adopted. Mack,¹⁰ in her discussion on the costs of uncertainty, indicates overconservatism or

⁹These are rarely sold, most often they are: 1) kept for household consumption; 2) given to the farm workers; 3) used for animal feed; and/or 4) thrown-out.

¹⁰Ruth P. Mack, Planning on Uncertainty: Decision-Making in Business and Government Administration (New York: John Wiley & Sons., Inc., 1971), p. 5.

resistance to change as a consequence of operating within an uncertain environment. In such situations, the farmer would adopt a standard operating procedure which would, year after year, result in a constant input mix causing per unit output to remain stable.

Price. To examine the relationship between price movement and output shifts, farmers were asked if they could identify the months of highest and lowest prices (Table IV-9). Since there were no long-term records of farm level prices, wholesale prices were used. It will be seen in Chapter VIII that for that one year where wholesale and farm level

Table IV-9. Percent of Small and Large Farmers Identifying the Months of Highest and Lowest Prices According to the Wholesale Price Index

Month	Small Farmers (percent)	Large Farmers (percent)
Highest	39.1	58.8
Lowest	69.6	58.8
No Idea	13.0	8.8

Source: Farm level survey for this study.

prices were available, both tended to move together. Thus it would be expected that an index of farm level prices for potatoes closely follows the wholesale price index. Using the wholesale price index constructed by Villasuso and Vargas,¹¹ January was the month of highest prices while September was the month of lowest prices.

¹¹J. M. Villasuso and Alvaro M. Vargas, Indices Estacional de los Precios al Por Mayor y al Por Menor de 18 Frutas y Hortalizas en Costa Rica (San Jose: IFAM-PIMA, 1973), p. 80.

As would be expected, most farmers know when prices are generally at their lowest, since that is the period when they are all on the market. That the small farmers are not as able to identify the month of generally highest prices relates to the fact that they are not on the market at that time. The small farmer's knowledge of prices is associated with the months that he physically enters the market (i.e., is selling his production at the Cartago market).

Besides knowledge of seasonal price patterns, the ability to accurately gauge short-run changes in price will substantially influence expected total revenue. Farmers were asked what would be the next Sunday's potato price on the Cartago market. The price they gave was compared with the actual price for the following Sunday at the Cartago market. In both cases, the difference was large, however, it was larger for the small farmer, representing a difference of 40 percent from the average price. More important, however, is that a large percentage of farmers did not know what price to expect on the following Sunday-- 61 percent of the small farmers and 23 percent of the large farmers, respectively, were unable to estimate the next week's price. The inability of small farmers to formulate expected prices, especially given the fact that prices are highly volatile at the farm level (see Chapter VIII) suggest that price expectations may not play an important part in their marketing decisions.

Since prices in the Cartago and San Jose markets are related, knowledge of price movements in San Jose would aid in formulating the expected Cartago price. Farmers were asked what was the previous day's wholesale price in San Jose. Those same farmers who were unable to formulate an expected farm level price, were generally unable of the

San Jose wholesale price. For those farmers able to answer, the difference between what was thought to be the wholesale price and the actual price was considerably smaller than at the farm level. This is probably due to: 1) the fact that prices fluctuate less at wholesale which allows for more accurate estimation of prices, and 2) farmers have actually heard the San Jose price and were reporting a fact rather than an estimation.

To examine price responsiveness, farmers were asked if the area they plant in potatoes has changed over the last five years (Table 11-10).¹² It was considered that change in land area would be the best expression of a possible response to price changes, since total production could easily be affected by varying the land area under cultivation. It would be possible, however, that for a given five-year period the grower could be very responsive to yearly price changes, but by averaging out the change there would be little variation in area; i.e., increasing land area in some years decreasing the land area in other years. Therefore, they were also asked if they would plant more land the following year--March 1976 --(Table IV-11). The results are especially interesting since the interviews were conducted during a period when potato prices were at a record high. Furthermore, the ratio of onion to potato prices, which had remained fairly stable around 1.5 from 1970 to 1973, fell to 1.3 in 1974 and then rose at the time of the interviews to 1.8. The ratio of potato prices to factor prices which was falling from 1972 to 1974, rose to above the 1972 level in 1975.

¹²Time series data regarding area planted by farm size was not available.

Table IV-10. Percentage of Small and Large Farmers Planting More, Less, and the Same Land Area in Potatoes Between 1970 and 1974

Size	More Land (percent)	Less Land (percent)	No Change (percent)
Small	29.2	4.1	66.7
Large	23.5	17.6	58.8

Source: Farm survey for this study.

Table IV-11. Percentage of Small and Large Farmers Who Plan to Plant the Same, More, or Less Land Area in Potatoes in 1976

Size	More Land (percent)	Less Land (percent)	No Change (percent)
Small	27.3	13.6	59.1
Large	29.4	35.3	35.3

Source: Farm level survey for this study.

Over the past five years, a large portion of the farmers planted the same area in potatoes, and for 1976 about half of the small growers will continue to plant the same area. For the larger grower, only slightly over a third intend to continue planting the same land area, the other two-thirds are changing their production strategy.

To further examine the relationship between potato price and production a linear equation with production of potatoes in year t as a function of the deflated, lagged potato prices, as well as lagged prices of other locally grown products was used. At first, the price of carrots was included in the equation, but since the price movements of potatoes and carrots were highly correlated, suggesting multicollinearity,

the latter was dropped from the equation leaving only lagged potato and onion prices as the independent variables. Five different forms were tried (Table IV-12); 1) production in year t was assumed to be a function of price in the previous year, or in other words, a one-year lagged response; 2) since most potatoes are planted in the early part of the year, the March price, just before planting begins, was assumed to be influential; 3) similarly, the first harvest in year t is planted late in year $t-1$, thus, the price closest to planting was assumed to influence production decisions; 4) since planting takes place twice yearly, it was assumed that an average of the price previous to each planting season would substitute for the one period lagged price in the farmer's price estimation calculations, and 5) a combination of a one-period lagged potato price with the onion price just before planting assumed that potato production decisions would be influenced by last minute changes in onion prices. Since no Cartago time series price data exists, the San Jose wholesale price was used a proxy for farmer price. For the period that prices are available for both locations, they tend to move together, although the Cartago price is characterized by larger weekly fluctuations.

The results (Table IV-12) show a relationship between price movements and potato production. Calculated at the average, supply was price elastic for all five equations. Since small farmers are not as knowledgeable of prices as were the large farmers, it is suspected that the supply responsiveness reported in their equation was due to changes in large farm agriculture. Large farmers were seen to be more flexible in their production strategies, giving a greater weight to price movements in their decision-making matrix. The small farmers, on the other

Table IV-12. Results of Linear Equations Examining Potato Production as a Function of Potato and Onion Prices^a

	A ^b	B ^b	C ^b	R ²
Equation 1	333845.6 (3685.4)	41053.3 (9882.3)	-14180199 (4473764.8)	.59037
Equation 2	503744.7 (67736.5)	4383.44 (9145.7)	-15547947 (4280088.3)	.53866
Equation 3	322628.4 (44605.1)	24954.04 (11028.5)	-5268841.9 (3091282.3)	.30575
Equation 4	382286.19 (82945.1)	20558.82 (13839.8)	-10167351 (5025508.4)	.30987
Equation 5	455346.09 (47250)	11479.87 (6369.7)	-138284.58 (4023831.4)	.62072

^aThe functional form used was

$$Y = A + BX_1 + CX_2$$

where y = production of potatoes (cwt)

X₁ =

X₂ =

Equation 1:

Deflated average wholesale potato price in year t-1

Deflated average wholesale onion price in year t-1

Equation 2:

Deflated average March wholesale potato price in year t

Deflated average March wholesale onion price in year t

Equation 3:

Deflated average August wholesale potato price in year t-1

Deflated average August wholesale onion price in year t-1

Equation 4:

Deflated average March and August wholesale potato price in year t

Deflated average March and August wholesale onion price in year t

Equation 5:

Deflated average wholesale potato price in year t-1

Deflated average March wholesale onion price in year t

^bStandard error in parentheses.

Source: Ministry of Agriculture, Unpublished Farm Production Records, 1964-1973.

hand, demonstrate a predisposition towards planting the same land area. Given the fact that small farmers are less aware of price movement, it is most likely that their decision to maintain the same land area in production reflects a risk reduction strategy in the face of uncertainty due to fluctuating product and factor prices.

Potato Production as Part of the Whole Farm Operation

Potato production is the major enterprise on most of the farms in the Cartago region. For those farmers which were interviewed, approximately 70 percent of the total nonpasture land was used for potato production. On the rest of the land, numerous other crops were grown, with onions being the most common (74 percent of the farms), followed by carrots (38 percent of the farms). Half of the farms also had dairy operations, however, there were no small farms with more than three cows.

It would be expected that the farmer makes his production and marketing decisions based on factor and product prices for the different farm enterprises. As seen in Table IV-12, the cross elasticity of potato supply with onion prices is negative and very elastic. Based on the actions of the large farmers with respect to changes in potato prices, they are probably more involved in making short-run marginal adjustments in the enterprise makeup of their farm operation. The small farmers probably follow the same pattern with the other enterprises as with potatoes, that is, maintain input allocation more or less constant over time. Additionally, it appears that small farmers further attempt to reduce risks of large product price fluctuation by planting more crops. There were 52.2 percent of the small farmers growing more than one other crop besides potatoes, compared with 31.5 percent of the large farmers following the same strategy.

Farmer Characteristics

Residence. Most of the farmers live on or close by the land they work. The number of farmers sampled who live in Cartago (including San Rafael) is small--only eight percent of the small farmers and 21 percent of the large farmers live in Cartago. It is not quite correct to consider those farmers who live in Cartago as absentee landlords who devote the major part of their energies to nonagricultural activities. Rather, they have generally been born in the rural areas and have moved to Cartago to be closer to the center of economic activity--suppliers, the trading center, banks and the Ministry of Agriculture office are located in Cartago--as well as for social reasons.

Education. Costa Ricans enjoy a relatively high level of education, especially when compared to other Central American nations. The average level of education for potato farmers is 4.7 years, or the equivalent of almost a fifth grade education. The distribution of education is given in Table IV-13. While some education is very common, the large farmers are distinctly better educated, almost two-thirds of them have had more than a fourth grade education. One of the possible reasons for the difference in education may relate to age. Sixty percent of the large farmers are under 40 years old while only 37.4 percent of the small farmers are under 40 years of age. As more schools were built in the rural areas, younger farmers probably had a better chance of acquiring an education.

Attitudes. In order to gain an insight as to how farmers tend to view their social environment, seven attitudinal questions styled from

Table IV-13. Number of Years of Formal Schooling Completed by Small and Large Farmers

Size	0-1 Years (percent)	2-4 Years (percent)	5-7 Years (percent)	10-12 Years (percent)
Small	21.4	42.9	35.7	--
Large	10.5	21.1	52.6	15.8

Source: Farm level survey for this study.

other LAMP related research¹³ were asked. Underlying this approach is the assumption that one with a "more modern" outlook would respond differently and that responses to each question could be scaled on a continuum where one end would stand for traditionalism and the other modernization. Distinguishing between modernization and traditionalism represents an "analysis of socio-psychological variables which facilitate or hinder the evolution of an increasingly complex, technologically sophisticated society, a society whose members are capable of performing the tasks demanded by industrialization and who show the initiative and entrepreneurial drive which contribute to sustained levels of economic growth."¹⁴

The future orientation of an individual relates to the ability to defer gratification over an extended time period. A traditional person would tend to collapse the time frame into the very immediate future by

¹³David L. Peacock, "The Adoption of New Agricultural Practices in Northeast Brazil: An Examination of Farmer Decision-Making" (Ph.D. dissertation, Michigan State University, 1972).

¹⁴Harold Riley, et al., Food Marketing in the Economic Development of Puerto Rico (East Lansing: Michigan State University, Latin American Studies Center, 1970), p. 10.

highly discounting returns over time so that they rapidly become negative. Table IV-14 shows no difference between the large and small growers.

Table IV-14. Response to Question Examining Future Orientation, by Farm Size

Size	Question: "Do you believe that it is better to receive ₦90 within one year than ₦30 today?" ^a		
	YES (percent)	NO (percent)	NO OPINION (percent)
Small	16.7	50	33.3
Large	16.7	50	33.3

^aWhen it appeared that the interviewee did not understand the question, it was reworded as follows: "If you were to win ₦30 in the lottery, would you rather receive the ₦30 right now, or wait a year and receive ₦90?"

Source: Farm level survey for this study.

Fatalism is the extent to which one accepts outcomes as given, feeling that he has no control over his future. Three questions were used to explore this attitude. The first contrasts planning to letting events take care of themselves. A traditional response would express a belief that the future cannot be controlled, rather events will occur as they may. The second asks whether it is better to have luck than knowing how to farm well. Again, the traditional response would favor luck, since skill would imply control over one's destiny. Finally, respondents were asked if the best thing for one's children would be to become a farmer. It was considered that the farmer viewed his children

to some extent as an extension of himself, thus, a yes response would again show a belief in the lack of his ability to change the status quo. The responses to these questions are given in Table IV-15. Taking these three questions as a group, small farmers tend more towards the answers expected of a person with a traditionistic outlook.

Trust refers to the confidence that one has with other members of the society. The traditional attitude tends to view other members of society with little confidence, reserving trust only for members of the family. Two questions were used (Table IV-16): the first asked if one could be a partner with a person who was not a family member. The traditional response would reject associations with nonfamily members. The second question asked if he felt that other farmers were envious of his position. Since trust also requires an open relationship between the participants, the more traditional person would feel that his neighbors also look upon him with distrust. The apparent contradiction between the results of questions A and B relate to the fact that there already exists a form of partnership for planting potatoes, discussed above, which is fairly common. Thus, this pattern of behavior has developed over years to where it is now an accepted standard operating procedure.

Innovativeness refers to the willingness to experiment with a new or different process. As the process gains wider acceptance, it ceases to be new and different. The attitude most closely associated with modernity would be one which expresses a willingness not to wait, but to be among the first to try a new process. It is the large farmer who in this case is most likely to be among the first to try something different (Table IV-17).

Table IV-15. Responses to Questions Testing Fatalism, by Farm Size

-A-

Size	Question: "Do you believe it is better not to plan because the future will take care of itself?"		
	YES (percent)	NO (percent)	NO OPINION (percent)
Small	61.5	15.4	23.1
Large	57.9	26.3	15.8

-B-

Size	Question: "To make money, do you believe it is more important to be lucky than to know how to plan?"		
	YES (percent)	NO (percent)	NO OPINION (percent)
Small	50.0	25.0	25.0
Large	15.7	63.2	21.1

-C-

Size	Question: "Do you believe that the best for your children is to stay here as farmers?"		
	YES (percent)	NO (percent)	NO OPINION (percent)
Small	38.5	53.8	7.7
Large	15.7	63.2	21.1

Source: Farm level survey for this study.

Table IV-16. Responses to Questions Testing Trust, by Farm Size

-A-

Size	Question: "Do you believe that one can be a partner with another person, even if he is not a family member?"		
	YES (percent)	NO (percent)	NO OPINION (percent)
Small	69.2	7.7	23.1
Large	84.2	10.5	5.2

-B-

Size	Question: "Do you think that the other farmers don't like to see you get ahead of them?"		
	YES (percent)	NO (percent)	NO OPINION (percent)
Small	83.3	8.3	8.3
Large	83.3	11.1	5.6

Source: Farm level survey for this study.

Table IV-17. Response to Question Testing Innovativeness by Farm Size

Size	Question: "When a new technique for potatoes is developed, do you believe that it is best to wait, letting others try it to see what happens?"		
	YES (percent)	NO (percent)	NO OPINION (percent)
Small	46.2	53.8	--
Large	36.8	63.2	--

Source: Farm level survey for this study.

The answers to the above questions were equally weighted and scaled from one to three, with one being the expected traditional answer and three representing the answer that would be attributed to modernity. The results showed that the large farmers leaning towards attitudes most characterized with modernity (2.1), while the small farmers were tending more towards attitudes associated with a traditional view of one's environment or society (1.9). The difference between the two means is significant at the .05 level. This indicates that the larger farmers hold a different perspective than the smaller farmer. For the system as a whole, the farmers tend towards the center, that is, for a particular facet they may be very traditional while on another they will express an opinion associated with modernity.

Group Activities

As of March 1976, there were three groups representing the interests of potato growers. The oldest and most important is a private organization of mostly large farmers from the Cartago region. Founded in the late 1960's and located in Cartago, Agricultores Unidos S.A. operates as an input supplier to its shareholders. It attempted to market its shareholders' production, but failed due to problems of allocating its market access among the stockholders. Besides its input supply activity, Agricultores Unidos has organized successful lobbying campaigns in favor of policies supported by its shareholders.¹⁵ The Ministry of Agriculture, as well as other governmental agencies, turn to Agricultores Unidos shareholders to represent the grower's point of

¹⁵For example, in September 1975 they organized a successful campaign against the importation of potatoes for tablestock. They did this by use of the press and radio as well as by meeting with high government officials.

view various boards and special commissions. The result of these activities has been to identify the policy-making process with the large farmer welfare and give them first access to new economic opportunities coming from government programs.

There are four potato production cooperatives functioning in the Cartago region. Except for the Tierra Blanca cooperative, which was involved in marketing potatoes and is now experimenting with bottling figs for wholesale distributors, the cooperatives' activities are limited to providing production credit and input supply sales. Although the cooperatives count as members 70 percent of the potato growers in the Cartago regions, their influence is considerably less than this number implies. The cooperatives are not represented on any boards nor commissions formed by the government. It appears that most of their efforts are directed towards working within the national cooperative movement and not trying to exercise influence in regional affairs. Thus, these cooperatives which include a majority of the small farmers is not involved in influencing the policy-making process, except marginally through the national cooperative movement.

The exception to the apparent isolation of the cooperatives in regional and national potato policy-making has been the Tierra Blanca cooperative. In late 1974, at the urging of the Tierra Blanca cooperative a group was formed to promote the idea of a regional marketing cooperative. The members included representatives from the four cooperatives in the region, government officials who live and farm in the region and a few younger large farmers. They have begun to challenge Agricultores Unidos as the representative of potato grower interests. They have also expanded upon the earlier idea of a regional cooperative, in favor of a marketing board. As a result of their efforts, a law was

introduced in the Costa Rica Congress that would establish a vegetable marketing board. Since October of 1975 they have tried to coordinate with potato assemblers, and as of February 1976 one assembler has actively participated in the group.

Summary

Potato production is seasonal, being planted twice yearly to take advantage of the rainy season. Micro-climatic areas allow for potatoes to be planted and harvested throughout the year, if only in limited quantities. The growing period lasts generally 4-4½ months, but the exact time is determined by the micro-climatic conditions where planting takes place. The farmer can accelerate potato harvesting two weeks by cutting or chemically defoliating the plants.

Over the past 26 years, potato production has tended to become concentrated on large and small size farms at the expense of the medium size operations. It is considered that existing technologies for potato production in Costa Rica are not adaptable to intermediate size farms. The number of large farms has remained fairly constant, but they now produce a larger percentage of the national potato crop. Additionally, their output per hectare has greatly increased. Small farmers have increased in number; they have also increased output per hectare, but not by nearly as much as large farmers.

Although it appears that large farmers are becoming more important than small farmers in terms of total potato production, the actual costs of production are almost the same for the two groups of farmers. When comparing the production cost structure for the two groups, over a large range the small farmers were seen to be capable of producing

potatoes at lower costs than large farmers. The reason for the growing importance of large farm agriculture in the potato production-distribution system is not, therefore, due to strictly production cost advantages. It will be seen that many of the institutional arrangements used for trade favor the large grower and limit the ability of the small farm to expand output to take advantage of potential production level economies of scale.

Characteristics of the two groups of farmers showed the large farmers to be better educated. The large farmers were also somewhat more nontraditional in their attitudes than the small farmers.

A review of the organizations operating within the potato production-distribution system showed that the small farmer has had little representation in any of these organizations--except for the cooperatives. Only with the recently formed group advocating a Marketing Board has the influence of the small farmer, as represented by the cooperative leaders, extended into Cartago and beyond. Before that, Agricultores Unidos being the region-wide farmer organization was able to turn the opinions of their members--i.e. mostly large farmers--into policy and allowed them to benefit from government programs.

Differences between large and small growers were seen to exist with respect to knowledge of prices. At all levels in the distribution channel for potatoes, the small farmer is less informed and/or has a less accurate idea of prices. It is suggested that the small farmer, having to rely on poor price information, has adopted risk reduction strategies. They tend to maintain the same land area in potato production in the face of varying potato prices. Large farmers, on the other hand, are more responsive to changes in price, e.g. the determination

of the land area to be planted. Another strategy used by small farmers to reduce risks is to diversify farm activities over three or more crops. Large farmers have not diversified their operations to this extent. The small farmer, by adopting these above mentioned strategies to reduce risks, has isolated himself from the rest of the production marketing system in the sense that he does not respond to changing conditions within the system. These strategies have allowed the small farmer to continue to exist, but not to grow.

CHAPTER V

FARMER POTATO MARKETING

As the harvest approaches the farmer begins to formulate a marketing strategy. Alternatives are formulated around traditional practices but his perception of the price situation price expectations and the direction and magnitude of short-run changes in price. His perceptions of the system in which he operates will determine the alternatives which he considers as feasible. His strength vis a vis other participants in the exchange process, as well as the institutional arrangements governing trade, will influence the outcome of that exchange, and this will, in turn, affect his future production and marketing decisions.

Harvesting

The first decision which is faced by the grower relates to date of harvest. There are two components influencing the harvest date. The first is when and where planting occurs. By planting in different micro-climates, the farmer can vary periods when he is ready to harvest. Table V-1 shows the number of different locations where growers plant potatoes. Location in this context refers to different areas within the region and not to the number of fields planted within one area. Among small farmers, 76 percent cultivate all their potatoes from within one micro-climatic region; the large farmers, on the one hand, are able to diversify their production among different regions. The importance of this is seen in Table V-2 which shows the number of months

Table V-1. Number of Different Location of Potato Fields, by Farm Size

Size	Only 1 Location (percent)	2 Locations (percent)	3 or more Locations (percent)
Small	76.0	20.0	4.0
Large	29.4	47.1	23.5

Source: Farm level survey for this study.

Table V-2. Number of Months Selling Potatoes, by Size of Farm

Size	2 or less months (percent)	3 months (percent)	4 months (percent)	5 months (percent)	more than 5 months (percent)
Small	52.0	24.0	20.0	4.0	--
Large	11.8	29.4	23.0	11.8	23.6

Source: Farm level survey for this study.

each group is harvesting throughout the year. By harvesting more months, the large farmer is participating in the market for a longer time period, establishing himself as a steady source of supply. His physical presence in the market over longer periods of time permits him to learn the intricacies of the exchange process, as well as to develop his skills as a trader. It was seen in Chapter IV that the large farmer has more knowledge of potato price movements and of potato prices at different places in the distribution channel. This is due, in part, to his constant contact with the market. Additionally, by harvesting over a longer period of time, the large farmer: 1) spreads price risk over several months, and 2) is able to sell some potatoes in higher price periods.

The other alternative available to the farmer is the short-run option of speeding up the harvest by chopping the vines, or applying chemical defoliants. This permits the farmer to harvest potatoes about two weeks earlier than normal. This option is used by only 45 percent of the farmers, divided evenly between large and small farmers. The other alternative of leaving the potatoes in the ground offers limited possibilities due to risks of infection and attack by worms. Except for potatoes planted above 2700 meters, harvest begins within one or two weeks after the potatoes reach maturity. Thus, in the short-run the grower can time his entry into the market by approximately two weeks on either side of the expected harvest date.¹

Interestingly enough, there is little storage of harvested potatoes for future sales as tablestock (as opposed to seeds). None of the sampled farmers stored potatoes, and only one grower during the course of the investigation for this study was found to be storing potatoes, having begun four months previous. Technically, it is feasible to store potatoes with the climatic conditions near the top of the volcano. However, there are economic factors which discourage storage. When the initial costs of the potatoes put into storage are included in calculating the operating capital requirements, costs in setting up a storage operations become very high.² Additionally, financing for this activity

¹The relation between the short-run harvest option and weekly price fluctuation are examined in Chapter VIII.

²Kenneth Shwedel and Victorino Elizondo, Estudio de Mercadeo de la Papa en Costa Rica y Posibilidad, Utilidad y Viabilidad de la Union Regional de Cooperativas de la Provincia de Cartago (San Jose: INFOCOOP/AID, 1976), pp. 87-101.

would have to come from the farmer himself, since none of the banks loan money for what is considered to be a high risk operation.³

Negotiation

When the grower is ready to harvest, he usually goes to the city of Cartago to negotiate the sale of his production. Every Sunday morning between the hours of 10:00 a.m. and noon, potato growers and assemblers gather at the southwest corner of the Cartago municipal market to buy and sell potatoes. During the first hour, no trading takes place. It is at this time that payment from the previous week's sales are made. Also, both growers and assemblers spend the hour talking to each other, gathering information as to the supply on the market and exchanging impressions of demand in San Jose. Around 11:00 a.m., trading begins and normally lasts until noon.

Small growers bring a sample of 10-15 representative potatoes from their fields. Negotiations between small farmers and assemblers are based on this representative sample. The large farmers, on the other hand, do not generally bring samples to the Cartago market. Assemblers accept the word of the large grower that his potatoes are of acceptable quality.

After some bargaining, the grower and assembler enter into an oral agreement regarding: 1) price of potatoes per carga (18 cwt) based on the sample quality, 2) the amount of potatoes in cargas which are to be purchased, 3) the day or days when the assembler will pick up the potatoes, and 4) the amount to be readied for each pick up. Before the

³Potatoes are thought to be highly perishable. This opinion has resulted in potato storage being considered as a very risky proposition.

farmer returns to his farm, the assembler usually gives him the sacks--in bundles of 10, each to contain 180 lbs. of potatoes.

At no point is the agreement anything stronger than an oral agreement. In some instances, the assembler will retain possession of the sample as a gesture that a deal has been made, however, this is not a common practice. Also, it should be noted that at no time during the negotiation does any money change hands. The following Sunday after the arrangement was made, during which time the potatoes were picked up and sold, the grower and assembler again meet at the Cartago market. The assembler then pays the grower the price agreed upon less "a discount for potatoes of inferior quality." The discount most of the time has very little to do with the quality of the potatoes; rather it varies according to prices received in the San Jose market.

Perceptions of the market. The way in which the farmer perceives the market to be working will influence his choice of production and marketing strategies. Small and large farmers were asked how many assemblers are usually at the Cartago market. The average large farmer's response of 51 was very close to the number of assemblers identified by this study--56 assemblers. A large percentage of the small farmers were unable to answer the question--72 percent--while those who did answer greatly over-estimated the number of assemblers--127 assemblers was their average response.

Farmers were also asked if the assemblers sold potatoes on credit to wholesalers (Table V-3). As will be seen in Chapter VI, most large assemblers sell on credit while most small assemblers trade in cash--this is an important difference which affects their scope of operations and ultimately affects the farmer. Again, large farmers appear to be

Table V-3. Farmer's Knowledge of Assembler Selling Policy, by Farm Size

Size	Believe Assemblers Sell on Credit (percent)	Believe Assemblers do not Sell on Credit (percent)	Did Not Know (percent)
Small	44.0	8.0	48.0
Large	52.9	29.4	17.6

Source: Farm level survey for this study.

somewhat more knowledgeable than small farmers. Nearly half of the small farmers did not know whether or not assemblers sold to wholesalers on credit. The responses to these two questions suggest that the small farmer's perception of the potato marketing system differs from that of the large farmer.

Grower Assembler Contact. Large growers tend to sell regularly to the same assembler (Table V-4). While it is not a formally specified relationship, it does exist. This lends a large measure of stability and predictability to the LFSS.⁴ The growers and assemblers know that they have an assured outlet and a stable source of supply. Often the assembler serves as a source of information for the grower, suggesting that harvest be accelerated or postponed a week or two to take advantage of anticipated San Jose prices. Operating together, they form a relatively highly coordinated, albeit informal, vertical system.

⁴Jones reports that similar types of arrangements are found among African farmers and traders. "Farmers found it advantageous to establish long-term relationships with assemblers who, over a period of years, paid them a fair price." The traders, in turn, would enter into these relationships in order to "attempt to overcome these problems of identifying buyers or sellers and/or of achieving a satisfactory price, all at moderate cost." William O. Jones, Marketing Staple Food Crops in Tropical Africa (Ithaca: Cornell University Press, 1972), pp. 241-254.

Table V-4. Percentage of Farmers Who Sell to the Same Assembler by Farm Size

Size	Sell to Same Assembler (percent)	Sell to Different Assembler (percent)
Large	76.4	23.6
Small	45.0	55.0

Source: Farm level survey for this study.

Although 45 percent of the small farmers sell to the same assembler, upon close examination the relationship between the small grower and assembler is different than that of the large grower and assembler. Of the small growers who sell regularly to the same assembler, 17 percent sell to relatives compared with no sales to relatives by the large farmers sampled. Additionally, 65 percent of the small farmers have frequent nonbusiness contact with the assemblers who regularly purchase their potatoes. Only half of the large growers, on the other hand, have frequent nonbusiness contact with assemblers.

The regular relationships between the small growers and assemblers, it appears, are based on kinship or personal friendship while the large growers' regular relationships with assemblers are based less on friendship or kinship than on an economic mutuality of interest. This is further suggested by the fact that 67 percent of the small growers regularly sell to an assembler who lives and works in the nearby rural area, that is, they sell to their neighbors. This compares with only 28 percent of the large growers who regularly sell to rural assemblers.

Prices. Although both large and small farmers trade in the same marketplace, they receive different average prices. Table V-5 shows the average high and low price received by both groups of farmers between September 1974 and September 1975; it also shows the average difference between the agreed-upon Cartago market price and the price which was eventually paid to the farmer (discount). The fact that large farmers receive higher prices in both categories should not come as much of a surprise. They are more aware of price movements, and through a strategy designed to take advantage of the different micro-climatic

Table V-5. Average High and Low Potato Prices and Discounts Received by Farmers Between September 1974-1975, by Farm Size

Size	Average High Price (colones)	Low Price (colones)	Average Difference Between Negotiated Price and Price Paid (colones)
Small	1483.12	837.50	102.50
Large	1607.69	927.27	70.45

Source: Farm level survey for this study.

locations for planting, they are able to time their entry into the market to best take advantage of price fluctuations.

More important, however, is that the difference between the agreed upon price and that which was paid the following Sunday, was lower for the large growers than for the small growers. As mentioned previously, the large growers are on the market during more months of the year, and during certain periods they are almost the only source of supply. This gives them more bargaining power in dealing with assemblers; if an assembler offers lower prices or discounts heavily during

periods of large supply, the large grower can retaliate during periods of shortage by offering his production to another buyer. Another factor which accounts for the lower discount is the size of sale. The large growers negotiate an average of 12 cargas (218 cwt) per sale compared to 4.4 cargas (79 cwt) per sale for the small farmers. An assembler could fulfill his weekly needs for potatoes by dealing with one or two large growers instead of three to six small growers. This allows the assembler to enjoy certain economies of administration having to coordinate with only one or two suppliers.

Bargaining Power. The ability to deal from a position of power is, in part, the result of an accurate evaluation of the way in which the market sub-system operates. During the time that a farmer is selling his production, he is in fact learning about the operation of the market. The large potato farmer, by selling during more months than the small farmer, it was pointed out, acquires a better understanding of the marketing sub-system. Furthermore, it is not uncommon for the large grower to be present at the market even if he is not harvesting potatoes. In effect, he invests in the acquisition of information as to how the market operates. This information is used to determine production decisions as well as to estimate his position vis a vis other growers and assemblers. It is suggested that large farmers use this information to time their entry into the market. They are in a position to demand higher prices from the assemblers during periods of large supply because of their awareness of the assembler's dependence upon them during periods of short supply. The small farmers, on the other hand, generally sell only a few months of the year, usually during the months of large potato supply. Thus, small farmers do not acquire the necessary knowledge of

the potato market to identify alternative strategies which could enhance their bargaining power.

Alternative Arrangements for Selling Potatoes

Up to this point, discussion has focused on exchange negotiations taking place only at the Cartago market. Two other institutional arrangements are used for selling potatoes.⁵ The grower has the option of selling his production to wholesalers in San Jose. To sell in San Jose, the farmer must wash and transport the potatoes to the San Jose wholesale markets. At the market, he is competing against assemblers who have established relationships with wholesalers similar to those that exist between large growers and assemblers. The grower who sells at the San Jose market wishes to be paid in cash, while assemblers extend credit. As a result, farmers are often forced to sell at a lower price.⁶

Between September 1974 and September 1975 the average high price received by farmers selling in San Jose was ¢1607.50 per carga and the average low price was ¢835 per carga. Those farmers exercising this option were unable to obtain a higher price than the large farmer received at the Cartago market. During the period of peak supply, the resulting price was approximately equal to that of the small farmer who sold in Cartago. The actual returns to the farmer selling in San Jose were lower than the prices received indicate, since he had to bear the costs of washing and transporting the potatoes to San Jose.

⁵Farmers also sell directly to processors on a limited scale. Since this exchange occurs at the Cartago Market, it is not considered as a separate institutional arrangement for trading potatoes.

⁶The assemblers averaged between ¢1.47 to ¢6.63 more per cwt.

Given the expected price and returns from direct selling in the San Jose market, this is an activity carried on primarily by small farmers. Leaving aside assemblers who also plant potatoes, only 5 percent of the large farmers sell in San Jose compared to 21 percent of the small farmers. The potatoes which enter the market through this channel amount to only 7 percent of the total marketed production. This option, therefore, is only marginally used and is of little importance in the overall distribution of potatoes.

The other arrangement for selling potatoes is to negotiate the sale at the farm level. This seldom takes place; growers and assemblers from the same area go to Cartago to negotiate the sale. When farm-level exchange does occur, it involves the smallest producers bringing 100-200 lbs. of potatoes to an assembler who lives in the rural area. The terms of exchange are cash and include only the potatoes brought to the assembler's place of operation. The effect of this on the system is nil.

Summary

Most farmer first-handler trade takes place in the Cartago marketplace. Differences exist in the institutional arrangements for trade used by large and small farmers. Large growers tend to regularly trade with the same assemblers. This has led to greater coordination between the large farmers and assemblers. The large farmers by spreading out their harvest are able to provide the assembler with a steady supply of potatoes. The assemblers, for their part, provide the farmer with important market information and advice.

Large farmers receive higher prices than the small farmers. In part, this is due to the willingness of the assembler to pay a premium to maintain regular trading partners. Additionally, the higher product

prices may be due to the fact that trade with large farmers lends itself to administrative economies of scale for the assembler. More important, however, the large farmers are in a better bargaining position than small farmers. Part of the reason for their relative strength is that large farmers are more aware of the workings of the marketing sub-system and consequently develop strategies to improve their position.

The reliance on regular trading partners is not as important for small farmers as compared with large farmers. When the small farmer sells regularly to the same assembler, the relationship is based more on friendship or kinship than on a perceived mutuality of economic necessity. Because the small farmers often trade with different assemblers, they are required to bring a representative sample of their potatoes. Usually, most small growers traditionally enter the market during the same months, resulting in large quantities of potatoes on the market with accompanying low product prices. The small farmers by adopting risk reduction strategies which emphasized maintenance of traditional practices in the face of greater uncertainty, instead of developing greater coordination with assemblers, place themselves in a position of relative weakness.

Some farmers do attempt to sell directly in the San Jose wholesale markets. These growers, however, face certain barriers: 1) relationships which approximate a high degree of vertical coordination exist between assemblers and wholesalers, and 2) assemblers provide certain services to the wholesaler, e.g., credit and a constant supply throughout the year. To overcome these barriers, the grower would have to become a full-time wholesaler.

It is the small grower who tends to use the San Jose market as an alternative outlet. He does so because at the time: 1) there is

little activity on the farm, 2) he uses family labor to wash, dry and bag the potatoes, which he probably values at zero cost, and 3) he is probably unable to find off-farm employment resulting in his opportunity cost being close to zero at that moment. Thus, the use of the San Jose wholesale market is not really an alternative commercial outlet for the small grower, rather it serves as a source of employment as he undertakes some of the functions of an assembler.

CHAPTER VI

THE ASSEMBLY PROCESS

As potatoes move through the marketing channel from farmer to consumer, the first level of exchange is between the grower and the assembler. The assemblers are middlemen specializing in purchasing potatoes at the Cartago market from growers. They wash and classify the product before selling it, usually to wholesalers in San Jose wholesale markets. They are the link which coordinates grower activities with the rest of the system. The assembler's role is a key one in the coordination of the production-marketing system, and its performance will influence the welfare of the growers as well as other participants in the system.

There are 56 assemblers who regularly purchase potatoes from growers in the Cartago region. Of these assemblers all but three live and work in the Cartago area.¹ Of the remaining 53 assemblers 57 percent live and have their wash houses located in the Cartago suburb of San Rafael. The other 43 percent live and work in the rural areas of the Cartago region where potatoes are produced.

Assembler Characteristics

General Characteristics

Large assemblers are considered as those who handle 16,200 or more cwt of potatoes. They represent 54 percent of the total number of

¹Of these three, two are from Alajuela, and the third from San Ramon.

assemblers, yet they handle 70 percent of the total volume of potatoes that passes through the Cartago marketplace. The small assemblers, who represent 46 percent of the population, handle the remaining 30 percent of the potatoes. No one assembler can be considered as dominating the market; the largest assembler handles 8.7 percent of the potatoes, and the largest three assemblers control 24.8 percent of the market.

The amount of potatoes handled in 1974 ranged from 749 cwt for the smallest assembler to 33,696 cwt for the largest. The small assemblers handled an average of 9,243 cwt of potatoes in 1974 compared with 20,596 cwt handled by large assemblers.

One half of the assemblers handle other products besides potatoes, although on a much smaller scale. These are crops which also grow in the region--onions, carrots, and beets. With the latter two products there exists a complementarity of resource use since they are also washed before being sold in San Jose. Small assemblers tend more towards diversification into other product lines--60 percent of the small assemblers handle other products besides potatoes compared with 42 percent of the large assemblers.

Many assemblers are also potato farmers, and two large assemblers wholesale potatoes in San Jose. In total, 64 percent of the assemblers grow potatoes. While potato growing serves as a sideline for many assemblers, more of the small assemblers (70 percent) than larger assemblers (58 percent) grow potatoes.

There are two points which should be noted: 1) most of the assemblers have a real connection with farm production giving them an advantage in negotiating with growers who know little of the assembly process; and 2) small assemblers have yet to specialize in distribution activities to the degree that characterized large assembler operations.

Trends in assembler size. To obtain an idea as to changes in the amount of potatoes that assemblers marketed, they were asked if their annual volume had changed over the past five years. With both groups the percentage of those answering that they are marketing more potatoes was the same (33 percent) however, there is a larger percentage of small assemblers who are handling less potatoes--45 percent of the small assemblers compared to 25 percent of the large assemblers. When asked if they could handle more potatoes, 75 percent of the large assemblers answered affirmatively compared with 50 percent of the small assemblers. In almost all cases, those who felt that they could physically handle more potatoes were also of the opinion that they would not be able to market them. Not being able to market more potatoes indicates that there are additional barriers at succeeding levels in the channel.

Conditions of entry. Since historical data concerning the number of assemblers was not available, each assembler in the sample was asked if the number of buyers in the Cartago marketplace had changed over the last five years.² While this would not give a quantitative measure of change over time, it was considered that it would give an indication of the direction of change and ease of entry into the market. Only 4.5 percent responded that the number of assemblers has decreased, 63.6 percent indicated that there are more assemblers now than five years ago, the rest indicated that the number has remained constant. The consensus that the number of assemblers has increased indicates that

²The term "buyers" was used instead of "assemblers" (acopiadores) because the participants within the system do not differentiate this group or their function by the use of a separate term, rather all those who are neither farmers, retailers, nor consumers are middlemen (intermediarios).

entry is relatively easy; however, when asked if it is easy to become an assembler, only 45.5 percent answered affirmatively. Of those who felt that it is easy to become an assembler 60 percent are small assemblers. The probable reason for this difference is that each respondent interpreted the question to mean an assembler such as himself. What appears, therefore, is a picture of relatively easy entry as a small assembler with entry as a large assembler being more difficult.³

Among the difficulties of achieving large assembler status is the fact that large assemblers have established specialized operations held together by a series of informal agreements with growers and wholesalers. Furthermore, the exchange process is financed by credit from the growers to the assemblers. If someone unknown to the growers attempts to purchase potatoes he will find that unless he can pay cash at time of delivery it will be impossible to negotiate a transaction. This fact alone has limited almost exclusively the assemblers to those from the Cartago region. When one wishes to enter the market as an assembler, even if he is known, he may have to pay cash for the potatoes he purchases. This results in those who enter the market doing so on a small scale, financing their entry with savings or with a small family loan until they are able to trade on credit.

Education. Compared with growers, the assemblers are better educated. The average number of years' schooling is 5.5 years. Between the two groups, the large assemblers are better educated, averaging 7.2 years of schooling, compared with 3.5 years of schooling for the small assembler (Table VI-1).

³Among the small assemblers, 30 percent had been operating for less than five years. There were no large assemblers who were operating for less than five years.

Table VI-1. Number of Years of Formal Education Completed by Assemblers by Size of Assembly Operation

Size	Years of Education			
	0 (percent)	1-3 (percent)	4-6 (percent)	7 or more ^a (percent)
Small	20	30	40	10
Large	0	16.6	50	33.2

^aOne large assembler attended the University.

Source: Assembly level survey for this study.

Modernity

To examine the manner in which the assemblers perceived their environment, as measured along a traditional-modernity continuum, the same sets of questions were asked of assemblers that were asked of growers.⁴

Future orientation. Although the assemblers appear to have a somewhat longer planning horizon than farmers, they nevertheless seem unwilling to defer gratification for long periods of time (Table VI-2). The large assemblers, however, are somewhat more likely to be future oriented.

Fatalism. Questions A and B in Table VI-3 show the large assembler to be less fatalistic, expressing a belief that his destiny can be shaped by the force of his own activities. In question C, however, both groups express a similar opinion with respect to their children's future. An interesting anomaly within the marketing system may

⁴The questions were the same except that in some cases terminology was changed to refer to assemblers and their activities.

Table VI-2. Response to Question Testing Future Orientation by Size of Assembly Operation

Size	Question: "Do you believe that it is better to receive ₦90 within one year than ₦30 today?"		
	YES (percent)	NO (percent)	NO OPINION (percent)
Small	20.0	80.0	0.0
Large	33.3	58.3	8.3

Source: Assembly level survey for this study.

explain this response; while the intermediary may be looked upon as an undesirable part of marketing system, to become an intermediary for many farmers is perceived as a form of upward mobility. This would explain the fact that a large number of assemblers are satisfied with their position having first been farmers, and project this forward into the desired ambitions for their children.

Trust. The level of trust that assemblers have with nonfamily peer group members appears not to be very high (Table VI-4). The assemblers' answers to question A differ markedly from those given by growers. Among growers it is common to enter into a partnership for planting potatoes or other crops. Supported by a set of institutional arrangements for defining the conditions and obligations of partnerships, i.e., a medias, a level of trust has developed among growers. For the assembler, however, there are no socially defined arrangements for partnerships.

Innovativeness. Both groups appear to hold similar attitudes with respect to the adoption of new innovations (Table VI-5). This is

Table VI-3. Responses to Questions Testing Fatalism by Size of Assembler

-A-

Size	Question: "Do you believe it is better not to plan because the future will take care of itself?"		
	YES (percent)	NO (percent)	NO OPINION (percent)
Small	80	20	--
Large	50	50	--

-B-

Size	Question: "To make money, do you believe it is more important to be lucky than to know how to sell?"		
	YES (percent)	NO (percent)	NO OPINION (percent)
Small	60.0	20.0	20.0
Large	33.3	58.3	8.3

-C-

Size	Question: "Do you believe the best for your children is to become an assembler?"		
	YES (percent)	NO (percent)	NO OPINION (percent)
Small	50.0	40.0	10.0
Large	33.3	41.7	25.0

Source: Assembly level survey for this study.

Table VI-4. Responses to Questions Testing Trust by Size of Assembler

-A-

Size	Question: "Do you believe that one can be a partner with another person even if he is not a family member?"		
	YES (percent)	NO (percent)	NO OPINION (percent)
Small	20.0	70.0	10.0
Large	50.0	33.3	16.7

-B-

Size	Question: "Do you think that other assemblers don't like to see you get ahead of them?"		
	YES (percent)	NO (percent)	NO OPINION (percent)
Small	70.0	20.0	10.0
Large	66.7	33.3	--

Source: Assembly level survey for this study.

Table VI-5. Response to Question Testing Innovativeness by Size of Assembly Operation

Size	Question: "When a new technique for handling and selling potatoes is suggested, do you believe it is best to wait, letting others try it to see what happens?"		
	YES (percent)	NO (percent)	NO OPINION (percent)
Small	70.0	30.0	--
Large	66.7	25.0	8.3

Source: Assembly level survey for this study.

surprising since there has been a differential rate of adoption with respect to a recent innovation--the use of electric fans for drying potatoes. All but one of the large assemblers are using electric fans for drying while only half of the small assemblers dry potatoes with electric fans.

As with growers, the answers to these attitude related questions were scaled to determine where the assemblers would lay on a continuum running from traditionalism to modernism. With 2.0 representing the mid-point, the results for the large and small assemblers were 2.0 and 1.5 respectively. This apparent modernity of the large assemblers as contrasted with the traditionalism of the small assemblers will be seen to be consistent with manner in which large assemblers organize their assembly operations.

Perception of the Potato Marketing System

Assemblers were asked to identify the months of highest and lowest wholesale potato prices. The answers they gave were compared with the high and low months obtained from an 8-year monthly index of wholesale potato prices.⁵ While neither group was able to identify very accurately the month with the highest wholesale price, the large assemblers were more aware of the month of low potato prices (Table VI-6). The fact that in both groups many assemblers did not correctly identify the months of high and low wholesale prices may relate to the fact that assemblers consider periods of high and low prices rather than specific months, i.e., December through February were associated with high prices. What

⁵Juan M. Villasuso and Alvaro Vargas, Indices Estacionales de los Precios al Por Mayor y al Por Menor de 18 Frutas y Hortalizas en Costa Rica (San Jose: IFAM-PIMA, 1973), p. 80.

Table VI-6. Percentage of Assemblers Who Correctly Identified Month of Highest and Lowest Wholesale Potato Prices and Percentage of Assemblers Who Could Not Answer, by Size of Assembly Operation

Size	Knew High Month (percent)	Knew Low Month (percent)	Unable to Answer (percent)
Small	30	30	30
Large	33	66	16.6

Source: Assembly level survey for this study.

is more important, however, is the fact that there were some assemblers, especially among the small assemblers, who were unable to answer either question regarding high and low prices.

Since the assemblers are in competition against one another, knowledge of one's competitor is imperative in determining a strategy to follow. All of the assemblers when asked how their price compared with that of other assemblers were able to respond, which reflected at least a subjective level of knowledge concerning their relative position. When asked if it would be better for their business with more or less assemblers, 75 percent of the large assemblers compared with 40 percent of the small assemblers felt that a smaller number would be best.

The difference in the knowledge of the system in which they operate is not that large, but nevertheless it exists. The large assembler better understands what is occurring around him. This is seen in: 1) his opinion that a reduction in competition would be best for him, and 2) his decisions not to handle more potatoes because that would mean a lower price. The large assembler's knowledge of the system along with his tendency towards modernity have caused him to take decisions that

have resulted in a different organizational format for the assembly function--an actively coordinated vertical system--bringing higher returns and greater stability.

Exchange Process

It has been explained that farmers and assemblers gather on Sundays at the Cartago market to negotiate the exchange of potatoes. Furthermore, it was stated that a relationship exists between large growers and assemblers whereby the grower regularly sells to the same assembler or assemblers. The assembler, for his part, is willing to enter into this relationship and pay the grower a premium in order to routinize the acquisition of potatoes. These relationships mark the beginning of what will be termed an actively coordinated system. All systems are coordinated--otherwise they would not be systems. It is the nature and amount of coordination which determines the efficiency of a system. Passively coordinated systems would be those where no participant or group of participants takes the lead in organizing the exchange-distribution process.⁶ In an actively coordinated system one participant, or group of participants, will assume the role of channel captain providing leadership and direction with respect to the nature of the system's activities. The ability of the channel captain to provide quality leadership will determine the extent to which the system is coordinated and its performance.

⁶The perfect market model would be an example of such a system, where price is the coordinating mechanism, and participants are assumed to receive and accurately interpret all price signals and then be able to respond in a "logical" manner. When the basic assumptions on which this model are postulated, are violated, the passively coordinated system may result in a poorly coordinated system which does not contribute to the economic development of the system's participants nor to society at large.

Assembler-Grower Level Contact

At the grower-assembler level 43.4 percent of the total quantity of potatoes are exchanged on the basis of a relationship whereby farmers regularly sell to the same assemblers--39.3 percent between growers and large assemblers with the remaining 4.1 percent between small assemblers and growers. As a percentage of the total amount traded per group, this represents 52 percent for the large assemblers, compared with only 16 percent for small assemblers. The large assemblers have begun to participate in or form an actively coordinated system, which has allowed them to routinize the acquisition of over half of the potatoes which they purchase.

To facilitate this arrangement assemblers often make tentative agreements prior to the Sunday Cartago Market regarding the quantity of potatoes to be purchased. The exchange, however, is not formalized until the grower and assembler meet at the Cartago Market and agree upon: 1) price, 2) exact quantity, and 3) the days that the assembler will pick up the potatoes. The relationship is used to facilitate vertical coordination as assemblers often will advise growers with respect to the harvesting and selling of potatoes. If price changes appear imminent assemblers will suggest that harvest be accelerated or delayed to take advantage of the short-run fluctuations. This involvement of assemblers in the decision-making process of their growers is practiced by 50 percent of the large assemblers.

Upon terminating the negotiation the assembler and grower agree on the day or days that the assembler will pick up the potatoes and the amount that the grower must prepare for each pick-up. The schedule is arranged by the assembler, and relates to number of days per week he

sells in San Jose. Those who sell daily in San Jose likewise receive potatoes daily. Generally, they pick up potatoes in the afternoon, holding them through the night to be washed the next morning. The prepared potatoes are taken to San Jose early the second morning for sale that day. Those who do not sell daily in San Jose also schedule the pick-up of potatoes approximately 36 hours before leaving for San Jose. To pick up the potatoes the assembler uses his own truck if he has one; if not, he pays a trucker a fixed rate per sack according to the distance between the assembler's location and the place of pick-up.

Connecting growers with assemblers, it was seen that the large growers are the ones who enter into relationships or arrangements for the sale of their product. Likewise, it is the large assembler who establishes this type of arrangement with growers to purchase potatoes. Large assemblers and large growers are, therefore, trading among themselves. The actively coordinated system then is comprised of essentially large farmers and large assemblers who trade together recognizing the mutual advantages that arise from this exchange relationship.

Size of transaction. Small assemblers handle an average of 191.7 cwt per week, while large assemblers handle almost two and one half times that amount, 452.9 cwt weekly. Large assemblers purchase in average size lots of 234 cwt per transaction compared with 140.4 cwt per transaction for small assemblers. Both groups need to make about two transactions per Sunday market to acquire the potatoes they require for the week.

Preparation

The potatoes are brought from the field to the assembler's washing facility. The preparation involves three stages: 1) washing, 2)

drying, and 3) sorting and packing. The potatoes are prepared in wash houses (lavenderos) generally located alongside the assembler's house. The wash houses are usually wooden structures with cement floors, and are often used as a garage. The average size wash house used by small assemblers is 138 square meters compared to 310 square meters for wash houses used by large assemblers. For both large and small assemblers most of the wash house area is used for drying.

Potatoes are washed by hand in wooden or cement troughs which hold approximately 18 cwt of potatoes. After rinsing, the potatoes are extended on the floor, often over burlap bags, and, if the assembler has a fan it is used to accelerate the drying process. During the dry season potatoes are often set outside in the metal baskets to dry. More often than not, and especially during the rainy season, the potatoes are not adequately dried before they are packaged for sale in San Jose. While the use of fans has resulted in potatoes being dryer it does not guarantee a dry product. The problem is complicated because potatoes are packed in 100 pound plastic rather than burlap sacks.⁷ The plastic prevents air from circulating which, when held by wholesalers for a number of days, accelerates potato deterioration.

When the potatoes are ready to be bagged they are classified by size and appearance. Those potatoes which are fairly large size and not damaged are selected as top grade potatoes. Smaller or damaged potatoes are used to fill the sacks, being placed near the bottom,⁸ or sold to

⁷Small, 5 to 10 pound, perforated polyethelene bags are sometimes used by supermarkets.

⁸There is very little selling of potatoes by grades. Usually they are all mixed together, occasionally, however, there will be bags of small, or highly damaged potatoes entering the market.

potato chip makers. The unsaleable potatoes are either given to the workers or thrown away. Although potatoes are received in 180 lb. bags, they are sent to San Jose in 100 lb. bags. After the bags are filled with potatoes, they are sewed closed and weighed. The weight is noted on a tag bearing the assembler's name or initial which is then attached to the bag. This is accepted by the wholesaler as the true weight of the potatoes with only limited spot-checks.

The amount of potatoes which are lost during washing and packaging does not differ significantly between large and small assemblers.⁹ Part of the losses may be attributed to potatoes of poor quality racked by the grower. Poor handling--potato sacks are often thrown and dropped--further add to losses. Additionally, it is considered that part of the losses at the wholesale and retail level can be attributed to improper drying and packaging.

Assembler-Wholesaler Contact

Almost all of the potatoes (92.7 percent) sold by assemblers move through San Jose. Six percent are distributed directly to larger hotels, restaurants, hospitals and supermarkets. The assemblers who direct delivery make arrangements as to quantity of potatoes from one delivery period to the next. Another 1.2 percent of the potatoes move directly to the San Jose Central Retail Market located in the downtown

⁹ Losses estimated for October 1975--19.4 percent and 19 percent for small and large assemblers respectively--were relatively large due to: 1) it being the rainy season, and 2) extensive worm damage to the tubers before harvest. During the rainy season the potatoes enter the washhouse covered with mud. Thus, there are weight losses as the mud and dirt is washed off, as well as losses from those potatoes which were of poor quality but nevertheless packed by the farmer--either purposely or through inefficient post-harvest selection.

area. The largest supermarket chain in the country, through a wholly owned subsidiary, has entered into a formal contractual arrangement with two of the large assemblers for potatoes as well as for other crops grown in the region. The assemblers deliver potatoes bulk packed (100 lbs.) and in 5 lbs. plastic bags to the supply company warehouse.¹⁰ The rest of the potatoes are traded in San Jose's wholesale markets.

Within San Jose there are two wholesaling areas. The oldest is the Borbon Market and its surrounding buildings and streets located in the downtown area. The other area where wholesaling takes place is at the 10th Avenue or San Jose Wholesale Market. This market was constructed in late 1960's in hopes of removing wholesaling activities from the downtown area, more for the elimination of urban problems than for marketing reasons. For a number of years after its construction the market remained idle, wholesalers and assemblers preferring the traditional location at the Borbon Market. In November of 1974 the city of San Jose, which owns the 10th Avenue Market, prohibited trucks from loading and unloading around the Borbon Market obliging assemblers and wholesalers to use the San Jose Wholesale Market. In the ensuing year the San Jose Wholesale Market became the center for wholesaling activity, while the Borbon Market area's importance as a wholesale center decreased

¹⁰This supply company has been operating since late 1974, and has established three assembly centers in the key vegetable producing areas of Costa Rica. These centers are staffed by direct hire personnel or by contract with local assemblers. Each center is equipped with a short-wave radio which permits the warehouse to be in constant contact with the rural suppliers and change orders if necessary. In addition to this phase of the operation, they are planning to enter into direct contractual arrangements with some farmers as well as becoming involved directly in the production of certain key fruits and vegetables. They have introduced a rudimentary but practical grading system, paying higher prices for top of the line products. In February of 1976, the parent company, the supermarket chain, began an advertising campaign advising consumers of their top quality produce, using the same description of quality as used for grading in their assembly centers.

markedly. With respect to potatoes, only 6.8 percent move directly into the Borbon Market, the rest go to the San Jose Wholesale Market. Those that go directly to the Borbon Market do so as part of an agreement between the wholesalers and assemblers involved.

The potatoes which pass through the San Jose Wholesale Market, are sold to: 1) truckers who redistribute the potatoes throughout the rest of the nation; 2) wholesalers from both wholesale markets who sell to retailers and consumers; and, 3) on a very reduced scale, to retail store owners.

Although potatoes arrive daily at the market, Monday and Thursday are the major market days. Table VI-7 shows the distribution of assemblers who arrive at the market each day. Most of the small assemblers trade two or three days per week, while the large assemblers are usually at the market five or six days per week.

Table VI-7. Percent of Assemblers who Trade at San Jose Each Day, for All Assemblers and By Size of Assembly Operation

Size	Mon. (percent)	Tue. (percent)	Wed. (percent)	Thu. (percent)	Fri. (percent)	Sat. (Percent)
Small	87.5	50.0	12.5	100	50.0	37.5
Large	100	83.0	66.6	100	91.6	91.6

Source: Assembly level survey for this study.

The assemblers who sell in the San Jose Wholesale Market usually arrive between 2 and 4 a.m. Wholesaler-assembler trading begins between 3:30 and 4:00 a.m., lasting until about 6:30 a.m. at which time retailers begin to arrive. Since trade between wholesalers and assemblers

lasts for about three hours, any time spent selling much over three hours would indicate difficulty in negotiating exchange. Large assemblers spend an average of 3.6 hours in the market selling their product. This compares with small assemblers who spend 4.6 hours selling in the San Jose Wholesale Market. The small assemblers ship an average of 59.4 cwt per trip to San Jose and need 4.3 transactions to sell that amount. Large assemblers, on the other hand, average 95.4 cwt per trip, yet need only 2.6 transactions.

Besides selling in smaller lots small assemblers are less likely to sell on credit than large assemblers. While 83.3 percent of the large assemblers sell all their potatoes on credit, only 50 percent of the small assemblers do so. A possible reason for not selling on credit is that small assemblers are less likely to own a truck. Since most hired transportation is on an immediate payment basis, the assembler who uses a trucker may face a cash-flow problem if he tries to sell on credit. On a routine basis 91 percent of the potatoes are traded on credit. Consequently, one who does not extend credit is at a disadvantage in the market. Of the total sales by small assemblers, 21 percent are cash and carry compared to only 5.3 percent cash and carry for the large assembler.

Potatoes sold during the week on credit are paid for on the last trading day of the week, i.e., Saturday. The assembler visits each client to collect. This process involves most of the morning and sometimes lasts into the early afternoon. There is little difference as to the time needed to collect by both groups of assemblers, about five hours. At the time of collection the assembler and buyer often go through a renegotiation process. Defaulting on payments, or postponement from one week to the next, while it does occur, is not frequent.

The nature of the relationship between certain growers and assemblers which approximates a regular or fixed arrangement for the exchange of potatoes has been discussed above. A similar, if not somewhat more formal relationship exists between assemblers and their buyers. Usually, the buyer informs the assembler at the time of delivery of the quantity of potatoes which should be brought for the next delivery. Potatoes traded through this type of an arrangement account for 43.2 percent of all assembler sales; 8.3 percent from small assembler-buyer exchanges and the other 34.9 percent from large assembler-buyer exchanges. For the large assembler, exchanges originating out of these arrangements represent 47.3 percent of his total sales. If this figure is compared with the 52 percent of the potatoes which the large assembler receives under a similar arrangement from growers it shows that approximately half of his trade takes place within a highly vertically coordinated marketing system. Furthermore, if this trade is considered as a low risk operation then it is the large assemblers who monopolize low risk trade. The high risk trade is shared by the large assemblers--accounting for the other half of their transactions--and the small assembler.

The relationship that the large assembler has with his buyers, together with selling in larger lots and trading on credit results in his receiving higher prices with less variability, measured by the absolute difference between the average high and low prices (Table VI-8). In periods of limited supply, the small assembler can command almost as high a price as the large assembler. During periods of over-supply the small assembler is at a disadvantage, since buyers trade first with their regular suppliers--the large assemblers--while paying a premium for year-round stability. The small assembler who does not have regular

Table VI-8. Average High and Low Prices per Cwt and Differences Between Them by Size of Assembly Operation

Size	High Price (colones)	Low Price (colones)	Absolute Difference (colones)
Small	144.50	53.20	91.30
Large	147.27	64.18	83.04

Source: Assembly level survey for this study.

clients is forced to lower his price to be able to sell his potatoes. The option of selling potatoes to retailers while feasible is not practical in that it often involves selling in lots smaller than one bag; additionally the assembler operates under a time constraint since he has to return to supervise that day's activity at the wash-house. Taking the potatoes back to the wash-house may imply a transport cost and it means he will be faced with selling them again, meanwhile the quality will deteriorate. Furthermore, he will have to refuse to pick up potatoes from growers with whom he has made prior arrangements. Thus, the option he generally selects is to lower his price to sell all his potatoes.

Costs of Operation

The assembler upon negotiating the purchase must still pick up the potatoes, wash, bag, and sell them, usually in San Jose. To carry out these activities family help plays an important role in the labor force, especially for the small assembler. Family labor comprises 65 percent of the small assembler's labor force compared with 49 percent of the large assembler's total labor force. The extensive use of family labor raises

the question as to how it should be valued in the cost calculation: 1) at the wage rate paid to hired employees, or 2) at a rate reflecting an opportunity cost equal to zero. There is also the question as to what value should be placed on the assembler's labor: 1) as a worker, or 2) as an administrator. Total costs, calculated under the different labor cost alternatives, are presented in Table VI-9.

Table VI-9. Cost per Cwt of Potatoes Handled by Small and Large Assemblers Under Different Labor Cost Alternatives

Size	Zero Cost Family Labor Assembler Paid Wage Rate (colones)	Wage Rate Paid to Family Labor and Assembler (colones)	Zero Cost Family Labor Assembler Paid as Administrator (colones)	Wage Rate Paid Family Assembler Paid as Administrator (colones)
Small	7.35	9.42	8.93	11.05
Large	6.07	6.74	6.71	7.39

Source: Assembly level survey for this study.

It was decided to value family labor as being free to the assembler. The family members who work with the assembler are generally his children, dividing their time between school and work. It is unlikely that they could obtain alternative part-time employment at a pro-rated wage rate comparable to that paid to hired labor. Thus, their opportunity cost was set at zero for the purpose of calcularing assembler costs.¹¹

¹¹ It is recognized that the opportunity cost of family labor probably lies between zero and the wage rate paid to hired labor. The decision as to the correct opportunity cost, however, would be somewhat arbitrary since there are no clear guidelines for valuing family labor in this case as existed for valuing farm family labor. Since a zero cost family labor favors small assembler cost calculations, it was considered that its use would contribute to highlighting the cost disadvantage of the SFSS.

It was also decided to value the assembler's wage as that of a hired worker. It was considered that the assembler views the residual return as his wage as an administrator; his other activity as a worker is therefore valued at a worker's wage.

The per cwt average weekly fixed and variable costs were calculated under the above mentioned labor cost assumptions using October 1974 cost data collected for this study (Tables VI-10 and VI-11). The cost of the raw material, i.e., the potatoes, were not included nor was

Table VI-10. Variable Costs per Cwt of Potatoes Handled by Small and Large Assemblers

Concept	Small (colones)	Large (colones)
Labor ^a	2.67	1.57
Transportation to wash house	1.88	1.98
to market	1.11	1.11
Selling ^b	.28	.19
Collecting ^c	.09	.05
Utilities	.10	.06
Material	.38	.32
TOTAL	6.51	5.28

^aLabor used in washing and preparing potatoes.

^bValue of time spent negotiating sale in market.

^cValue of time spent collecting for potatoes sold on credit.

Source: Assembly level survey for this study.

Table VI-11. Fixed Costs per Cwt Handled by Small and Large Assemblers

Concept	Small (colones)	Large (colones)
Building	.62	.63
Trough	.008	.003
Baskets	.18	.14
Fans	.02	.01
Scales	.01	.008
TOTAL	.838	.791

Source: Assembly level survey for this study.

a value attributed to potato losses, since both value and quantity changed throughout the month. Transportation costs were calculated using fixed rates by distance per unit transported regardless of whether or not the assembler utilized his own truck. It was pointed out that assemblers, especially the small assemblers, handle other products besides potatoes. The costs reported here do not reflect an attempt to allocate total costs among all products handled. The reasons for this decision relate to the following: 1) potatoes are the most important product handled, with other products handled usually during periods of short potato supply; and 2) only one assembler was found to be handling other products during the period in which the interviews were conducted. The average cost per cwt handled is ¢1.28 lower for the large assembler.

To further examine assembly costs an average cost function was calculated for both large and small assemblers (Table VI-12 and Figure VI-1). Using the same statistical procedure discussed in footnote 6 of Chapter IV, the large and small average cost assembly functions were

Table VI-12. Assembly Operation Average Cost Function per Carga of Potatoes Handled by Small and Large Assemblers^a

Size	A ^b	B ^b	C ^b	R ^b
Small	78.49 (25.1)	437.73 (38)	.063 (.11)	.96
Large	23.03 (133)	1947.1 (2292)	.016 (.05)	.36

^aThe functional form used is:

$$Y = A + B/X + CX^2$$

where: Y = cost per carga
X = cargas handled

^bStandard error in parentheses.

Source: Assembly level survey for this study.

seen to be different at the .05 level of significance. This implies that the two groups of assemblers were operating along separate cost functions.

The small assembler handles an average of 191 cwt per week at a cost of ¢7.35. Even if he were to expand his operation to the point of least cost output as indicated by the average cost function his cost would only fall to ¢6.67--still higher than large assembler costs. Thus, it appears that as long as small assemblers continue functioning along this cost curve, they will not be able to achieve a cost advantage over the large assemblers.

Technical efficiency. Two criteria were used to compare the operating efficiency of both groups of assemblers. Labor costs for the large and small assemblers were the largest single cost component. To measure the efficiency of labor use, therefore, input-output ratios for labor were calculated. For the small and large assemblers the ratios

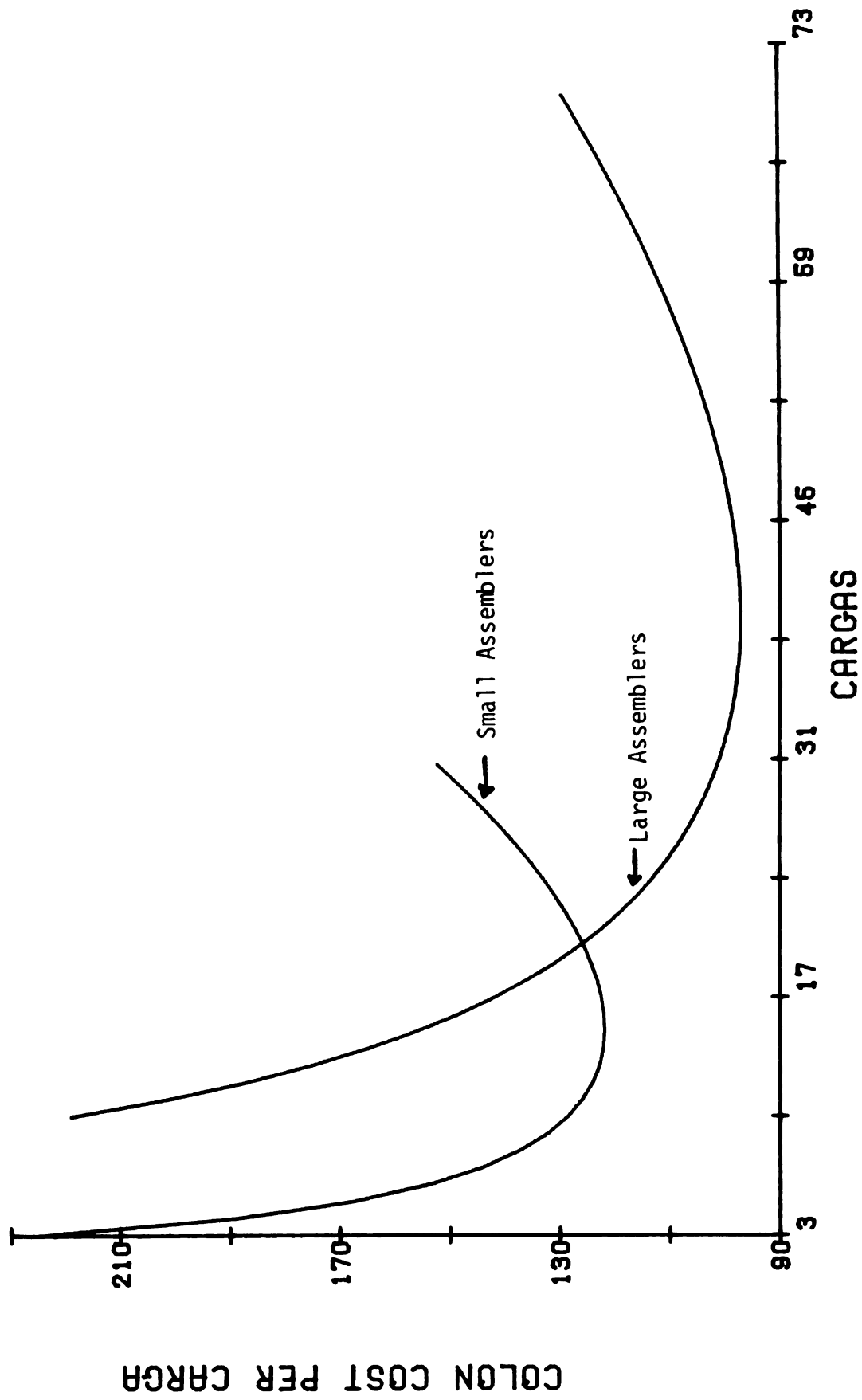


Figure VI-1. Assembly Level Average Cwt. Curves per Carga Handled.

Source: Table VI-12.

were .444 and .192 respectively, showing the large assembler to be more efficient in labor use. The relative efficiency of the large assemblers is further seen when it is noted that the number of workers is approximately equal for the small and large assemblers--4.77 workers to 4.83 workers respectively.

The second aspect of the assembly process influencing efficiency and, thereby affecting costs, is the usage of fixed assets. The assemblers were asked to estimate the number of cargas that they can prepare per eight hour day. This figure was then compared with the actual amount of potatoes that they prepare. The large assemblers work at 90 percent of estimated daily capacity compared with 87 percent estimated daily capacity for small assemblers. While this difference based on an eight hour working day is small, difference in intensity of use is apparent when the actual working hours and days worked per week are compared. The large assemblers operate an average of 8.6 hours a day, 5.4 days a week, for a total of 46.44 hours per week. The small assemblers prepare potatoes an average of 7 hours a day 3.1 days a week, or 21.7 hours of use per week. The large assembler operates very close to full capacity. The small assembler has an excess capacity, which based on a six day work week would easily permit the doubling of his output. This, however, would present other problems, specifically the acquisition and sale of those additional potatoes.

Other costs. Assemblers were asked what they would consider a fair price to pay the farmer, and paying that price, what price they would have to receive in order to meet their operating costs and to earn a fair profit. It was considered that this would permit further examination of the cost differences between the two groups. The small

assembler felt that he needs a price of ¢18.33 per cwt to meet the costs of performing the assembly function. This compares with ¢13.60 per cwt for the large assembler. The actual costs of operation reported in this chapter were subtracted from the assemblers' estimated costs. This was equal to ¢10.98 for the small assemblers and ¢7.53 for the large assemblers. Part of this amount would include the losses of potatoes, and returns to assemblers. Since losses of potatoes are approximately equal, it appears that the small assembler needs a greater return to cover costs from operating in a higher risk environment.

Summary

Assemblers are the link connecting growers with the rest of the system, thus their ability to efficiently carry out the assembly function directly influences farmer welfare. Large assemblers were seen to be more efficient. They have established regular trading partners, both at the farm and wholesale levels, thereby permitting greater vertical coordination. It is considered that by providing the leadership for the vertical channel the large assemblers: 1) reduce their risks, 2) routinize assembly operations, and 3) are able to more efficiently use fixed and labor resources. The large assemblers, furthermore, operate at lower per unit costs, yet they receive a higher price on selling potatoes in San Jose than did the small assemblers--by being able to offer the wholesaler better trading conditions. The large assemblers' ability to operate at lower costs and command higher prices in the wholesale market permit them to pay higher farm level prices to growers.

Small assemblers were seen to be operating at a cost disadvantage compared to large assemblers. The differences in cost structures relates to the organization and scale of the assembly activity. The

small assembler relies to a much lesser extent on regular trading partners. They are somewhat more traditional and know less about the potato marketing sub-system. Furthermore, entry into the market as a small assembler is relatively easy. These factors make it difficult for small assemblers to establish a more efficient vertically coordinated channel for marketing. As a result, small assemblers face higher costs due to greater risks and uncertainties, yet receive generally lower prices in the San Jose market. In order to reduce some of the risks involved in assembling potatoes, small assemblers have diversified their operations by handling other products and by farming. Furthermore, due to the higher costs, small assemblers pay a lower price to those farmers from whom they purchase potatoes, i.e. the small farmers.

CHAPTER VII

POTATO WHOLESALING

Introduction

San Jose is the national distribution center for potatoes, as well as for most other fruits and vegetables grown in Costa Rica.¹ There are two wholesale markets in San Jose, the Borbon Market with its surrounding buildings and streets and the 10th Avenue or San Jose Wholesale Market. The physical conditions in the two locations are far from ideal. In the San Jose Wholesale Market potato wholesalers rent 8 or 16 square meter fenced-in stalls within a covered rectangular shaped structure. Tarps are used to enclose and to protect the stalls, nevertheless the potatoes remain somewhat exposed to the elements. There are no storage facilities in the market aside from the one to two day supply held for immediate sale. None of the stalls have electrical nor telephone outlets. In the Borbon area, potato wholesalers operate inside dark and damp buildings whose only technical advantage is the protection from rain, sun, and wind. Some wholesalers only rent floor space, either paying a fixed rate per week or a set fee for each sack of potatoes brought into the market. Others rent stalls which have fluorescent lighting and telephone connections. While there are special areas for storage in the Borbon Market, technically they are unsuitable for this purpose. The areas are located in the corners of the market where

¹Kelly Harrison, et al., Fomenting Improvements in Food Marketing in Costa Rica (East Lansing: Michigan State University, Latin American Studies Center), p. 46.

there is little ventilation, causing temperatures to be higher there than anywhere else in the market.

There are 30 potato wholesalers operating in the two market locations. Thirteen are located in the San Jose Wholesale Market, and the other 17 in the Borbon Market area. Of the latter group, 12 operate inside the Borbon Market, while the other five are scattered throughout the smaller market buildings nearby. There are also 17 trucker-wholesalers who purchase potatoes in the San Jose Wholesale Market to distribute to secondary markets throughout Costa Rica.

Wholesaler Characteristics

Potato wholesalers are not strictly wholesalers in that they do not exclusively sell to others who, in turn, resell the potatoes. Since they also sell to consumers, they may more correctly be termed wholesaler-retailers. This phenomenon is common in other Latin American marketing systems. Referring to nonperishable food merchants LAMP research has found that:

In order to supply the small-volume transaction requirements of large numbers of tiny retailers, the wholesaler-retailer has evolved. . . They are willing to sell any volume of product desired by the retailer or consumer. They are normally located in close proximity to each other, to the specialized wholesalers and to fruit and vegetable wholesalers (i.e., in the so called wholesale market area of the city). The consumer who wishes to take advantage of their lower prices (in comparison to neighborhood stores they generally supply) must be willing to suffer the associated transport cost, time expenditure and inconvenience. The functions of the wholesaler-retailer are breaking bulk, storage and sometimes credit and delivery.²

²Kelly M. Harrison, et al., Improving Food Marketing Systems in Developing Countries: Experiences from Latin America (East Lansing: Michigan State University, Latin American Studies Center, 1975), p. 33.

Wholesalers sell an average 28.5 percent of the total amount of potatoes they handle to consumers. In the Borbon Market area wholesalers sell more to consumers--45.2 percent of their total volume--than wholesalers located in the San Jose Wholesale Market--7.9 percent of their total volume. The reason for this difference relates to the nature of the two market areas. The Borbon area is located in the downtown section of San Jose; within this area are the San Jose Central Retail Market, numerous smaller retail markets, as well as many butchers and bakeries. The influx of consumers in the area makes it easy for the wholesalers to sell to them, and costly not to. The San Jose Wholesale Market, on the other hand, is located almost two miles from the downtown area and serviced by only one bus route. There are no other retail facilities nearby making it inconvenient for the consumer to purchase at this market.³ As a result of the importance of retailing in the operation of the Borbon area, these wholesalers handle more potatoes--55.1 percent of total--however, they sell only 42.2 percent of the total wholesaled potatoes.

Although the majority of the potatoes in the Borbon Market area are sold to consumers, it nevertheless, remains an important location for potato wholesaling. As mentioned above, its central location facilitates transportation, especially for small retailers who rely on bus service. Furthermore, most of the grain and nonfood wholesalers are located nearby. Thus, many retailers prefer to continue purchasing in the Borbon Market area.

³It should be noted that the San Jose Wholesale Market is still a relatively new phenomenon in the national marketing system, and its role in the system is constantly changing. By early 1976 the Market was serving as a retail produce center for the more affluent members of the society who owned their own cars. The ample area of the Market permitted cars to be parked along side of the stalls, making it more convenient to shop for produce there than downtown.

Wholesale-Truckers. In addition to those wholesalers operating within the two San Jose markets, there are wholesalers who purchase potatoes at the San Jose wholesale market, and distribute them to local markets and retailers in other areas of the country. These wholesalers may be divided into two categories: 1) specialized potato wholesalers, and 2) full-line produce distributors. Of the first group, six wholesalers were identified. They purchase potatoes for resale in Heredia (2 wholesalers), Alajuela (3 wholesalers), and San Ramon (1 wholesaler), selling to both retailers and consumers.

The remaining 11 wholesale-truckers supply the outlying markets of the nation. Potatoes represent only a small portion of their total line of products. During the course of a year they handle most of the products that enter the San Jose Wholesale Market, and at any given time the composition of produce on their trucks will represent the supply situation of the market. Usually they purchase at the San Jose Wholesale Market during the first hour of trading on Monday and Thursday mornings. Having a set route and clientele, they set out as soon as possible from San Jose, stopping to sell as they go along. Depending on the distances involved some work well into the night (10-11 p.m.) and continue part of the next day before turning back to San Jose.⁴ Those wholesale truckers who work in the Guanacaste peninsula, for example, take orders from their clients for produce to be delivered on the next trip, thereby reducing the risks from speculating as to what products and quantities to purchase in San Jose.

⁴Backhauls are not very common.

Entry

Entry into the market as a potato wholesaler appears not to be very easy. As with the assemblers, historical data regarding numbers of wholesalers was not available. Thus, the wholesalers were asked their opinions as the changes over the previous five years. Only 22 percent of the wholesalers said that their numbers have increased; a third said that there are now fewer wholesalers, while the remaining 44 percent felt that their numbers have remained constant. The average wholesaler has been in business for almost 13 years, and 89 percent of the wholesale operations have been in existence for more than six years. The other 11 percent have been functioning for less than one year, and are all located in the San Jose Wholesale Market. With the opening of the San Jose Wholesale Market an opportunity for entry presented itself, yet the response was limited. Many of the smaller wholesalers from the Borbon area, however, saw the opening of the San Jose Wholesale Market as an opportunity to better their position, and moved their operations to this new location.

Other Products Handled

Two-thirds of the wholesalers handle other products besides potatoes. These products are also grown in the Cartago region--onions, beets, carrots, cabbage and achiote.⁵ Since most of the wholesalers live or originally came from Cartago, it is probably the case that when they began to expand their product lines it was easier to move into products handled by Cartago traders. In all but two cases, potatoes are the principal product handled, while the other products are of less

⁵This is a red food coloring used in the preparation of many dishes.

importance. As would be expected, multi-product potato wholesalers are most prevalent in the Borbon Market area.

Education and Attitudes

Education. The average schooling for the wholesalers is 4.1 years (Table VII-1). This is lower than the educational level of either farmers or assemblers. Age does not appear to be a significant factor in explaining the difference in formal education. The average age of the wholesalers is 40.6 years; this compares with 37.9 years of age for the assemblers, the group of participants with the most formal education.

Table VII-1. Years of Formal Education by Wholesalers

0 Years (percent)	1-3 Years (percent)	4-6 Years (percent)	6-10 Years (percent)
22.2	22.2	44.4	11.1

Source: Wholesale level survey for this study.

Attitudes. To gain an insight as to how wholesalers view the social environment in which they operate, the same attitude questions were asked of them as were asked of farmers and assemblers. The wholesalers do not appear to be very future oriented in that none was willing to wait a year in order to triple his return (Table VII-2).

Wholesaler responses to questions exploring fatalism show a marked fatalistic tendency (Table VII-3). This is most apparent in question "A" on planning, where they expressed the opinion that success comes not through one's own initiative, but by letting events run their course.

Table VII-2. Response to Question Testing Future Orientation of Wholesalers

Question: "Do you believe that it is better to receive ₦90 within one year than ₦30 today?"

YES (percent)	NO (percent)	NO OPINION (percent)
0	88.9	11.1

Source: Wholesale level survey for this study.

Table VII-3. Responses to Questions Testing Fatalism in Wholesalers

-A-

Question: "Do you believe it is better not to plan because the future will take care of itself?"

YES (percent)	NO (percent)	NO OPINION (percent)
77.8	11.1	11.1

-B-

Question: "To make money, do you believe it is more important to be lucky than to know how to run the business?"

YES (percent)	NO (percent)	NO OPINION (percent)
55.6	44.4	--

-C-

Question: "Do you believe that the best for your children is to become potato wholesalers?"

YES (percent)	NO (percent)	NO OPINION (percent)
33.3	22.2	55.5

Source: Wholesale level survey for this study.

The responses to the questions regarding trust (Table VII-4) show wholesalers as willing to enter into partnerships with nonfamily members, yet there is only one example of such behavior in the system. While many of them have entered into agreements for receiving potatoes, such arrangements are with relatives who are also assemblers.

Table VII-4. Responses to Questions Testing Trust by Wholesalers

-A-

Question: "Do you believe that one can be a partner with another person even if he is not a family member?"

YES (percent)	NO (percent)	NO OPINION (percent)
55.6	33.3	11.1

-B-

Question: "Do you think that the other wholesalers do not like to see you get ahead of them?"

YES (percent)	NO (percent)	NO OPINION (percent)
100	--	--

Source: Wholesale level survey for this study.

In contrast to the very traditional attitudes expressed in their answers to the other questions, when questioned concerning innovativeness, wholesalers implied that they would be willing to try a new technique for selling or handling potatoes (Table VII-5). An explanation of this apparent contradiction lies in the fact that wholesalers may have considered moving to the San Jose Wholesale Market as an innovation in their potato wholesale operation.

Table VII-5. Response to Question Testing Willingness to Innovate by Wholesalers

Question: "When a new technique for handling and selling potatoes is developed do you believe it is best to wait letting others try it and see what happens?"		
YES (percent)	NO (percent)	NO OPINION (percent)
22.2	66.7	11.1

Source: Wholesale level survey for this study.

To locate the wholesalers along a traditionalistic-modernistic continuum the answers to the above questions were scaled as described in Chapter IV. The results placed the wholesalers on the traditional side of the continuum--with 2 as the mid-point, the average wholesale score was 1.75. The more traditional attitudes of the wholesalers along with other factors, have resulted in decisions being made which reinforce the status quo of their operating practices.

The Exchange Process

Wholesaler-assembler trade. Wholesalers purchase potatoes throughout the week, however, Mondays and Thursdays are the two most important days. Because Friday and Saturday are major food shopping days for the San Jose consumer, most wholesalers also purchase on Fridays to be ready for the heavy weekend demand. Potato wholesalers in the Borbon area, since they handle a larger volume, must purchase potatoes more frequently than other potato wholesalers.

Most of the wholesaler-assembler trade takes place at the San Jose Wholesale Market. Wholesalers and assemblers gather at one end of the market during the early hours of the morning to buy and sell potatoes.

When the wholesaler agrees to purchase the potatoes he assumes the responsibility for transporting them from the assembler's truck to his place of business. Wholesalers in the San Jose Wholesale Market pay porters one colon per sack to carry the potatoes to their stall. For wholesalers in the Borbon Market area, transportation costs are higher. They usually hire a small pick-up paying two colones per sack to take the potatoes from the San Jose Wholesale Market to the Borbon area, plus one colon for unloading. Those potatoes which go directly to the Borbon area are either: 1) bought under preexisting arrangements between the assembler and wholesaler; or 2) part of a vertically integrated operation. These potatoes are brought directly to the Borbon Market area during the early hours of the morning.⁶

Wholesalers receive about half of their supply of potatoes through regular or fixed trading relationships with assemblers.⁷ The wholesalers in the San Jose Wholesale Market purchase a higher percentage of potatoes through fixed relationships with assemblers--55.8 percent compared with 40 percent for those in the Borbon Market area.

Wholesaler-retailer and consumer trade. Retailers and consumers go to the wholesalers' stalls where they are able to visually inspect the potatoes, displayed in opened bags. Generally potatoes are sold without further grading by the wholesaler. When there is spoilage, or the wholesaler has purchased small or damaged potatoes, these are occasionally sold separately at a lower price. Between the wholesale and

⁶The City of San Jose allows large trucks to unload in the Borbon area between 10:00 p.m. and 4:00 a.m.

⁷The willingness of the wholesaler to enter into this relationship may be related to the fact that a large number of them have relatives who are assemblers. Thus, he is dealing with a family member reducing the risks and responsibilities of negotiating with outsiders.

and retail price the wholesaler maintains an average 15 percent mark-up. What constitutes a minimum wholesale transaction differs somewhat from wholesaler to wholesaler, but the average is 20.4 pounds.⁸

Fixed relationships between wholesalers and retailers are an important part of the wholesaler's operation--these sales represent 69.7 percent of the total wholesale sales. While this relationship is important to the wholesaler, it is not as strong nor as formal as that which exists between the assembler and wholesaler, or between the grower and assembler. There are no previous agreements as to how much the retailer will buy, rather the amount is made known when the retailer arrives at the wholesaler's stall. Very little information or advice is exchanged with respect to market conditions. It is likely that strong relationships between the wholesaler and retailer have not developed because: 1) there are many retailers on the market making it difficult to relate to all of them; 2) wholesalers and retailer do not live in close physical proximity as do wholesalers and assemblers;⁹ and 3) potatoe/wholesalers either specialize in potatoes or offer a limited line of products, thus the retailer must purchase from many sources in order to stock his store.

The relationship appears to have developed, however, through an extended interaction over time until it reached a point where the retailer became a regular buyer. As this type of relationship is established

⁸Potatoes were sold retail in units of 7 pounds, called a cuartillo. thus, the average minimum wholesale transaction was approximately three cuartillos of potatoes.

⁹Fifty six percent of the wholesalers live in the Cartago area, commuting each day to work. Many of the rest were originally from Cartago, but now live in San Jose.

trading thorough credit becomes more common. For the retailer this represents a form of financing, while for the wholesaler this guarantees the loyalty of the client. Sales on credit represent 43.7 percent of the total sales, or 58 percent of the total wholesale volume. The importance of credit in forming a relationship between wholesalers and retailers is such that 83.5 percent of sales to regular buyers are on credit. This type of relationship, held together through the financing of the purchase of potatoes represents a barrier to entering into potato wholesaling. A long time period is involved in building up this type of relationship, as well as large risks as the wholesaler begins to extend credit in the hopes of developing clientele loyalty.

Costs of Wholesaling

Table VII-6 presents the average weekly costs for wholesale operations in both the San Jose Wholesale Market and the Borbon Market area.¹⁰ Family labor accounts for half of the total labor force used for performing the wholesale function. Since family members perform a fairly specialized job (i.e., selling) and, therefore, can be easily employed elsewhere, it was considered that their opportunity cost is equal to the wage rate paid to hired labor. As with the assemblers, the wholesaler was also considered to value his labor at the wage rate paid to hired labor, and to regard profits as the return to his administrative role. Finally, neither the cost of potatoes nor the value of losses were included in the calculations since they vary throughout the year.

¹⁰It is recognized that other products traded would lower the cost per unit of potatoes handled. Thus, it was decided to disregard the two wholesalers who were only handling potatoes as one of many products. The costs, presented in this section, therefore, represent essentially the majority of the potatoe wholesalers whose principal product is potatoes.

Table VII-6. Total and Average Costs of Wholesale Operations per Week at the Borbon and San Jose Wholesale Markets

Item	San Jose Wholesale Market (colones)	Borbon Market Area (colones)
Rent	130.00	183.13
Labor	500.00	687.50
Transportation	101.67	375.00
Equipment	5.83	5.63
Utilities	--	17.19
Total	737.50	1268.45
Cost Per Cwt.	7.25	10.15

Source: Wholesale level survey for this study.

The Borbon Market area has a higher per unit cost. In the Borbon area the average rent per square meter is \$88.63 compared with \$48.75 per square meter in the San Jose Wholesale Market. Land values in the downtown area are higher than elsewhere in the city, but this is a highly active commercial area. Thus, those who operate in the Borbon Market area are paying a premium for their location. Additionally, by providing more retail services to consumers the wholesalers incur greater costs--especially labor costs. Other cost differences between the two areas relate to transportation and utility costs. The latter were discussed earlier. In the San Jose Wholesale Market utilities are included in the rent, however, only lighting is provided.

To further examine cost relationships, an average cost function for wholesaling was estimated from the cost data collected for this study

Table VII-7. Wholesale Operation Average Cost Function per Carga of Potatoes Handled^a

A ^b	B ^b	C ^b	R ²
-11.12 (6)	75.2 (25)	.146 (.04)	.79

^aThe functional form used is:

$$Y = A + B/X + CX^2$$

where: Y = Cost per carga
X = Cargas handled.

^bStandard error in parentheses.

Source: Wholesale level survey for this study.

(Table VII-7). Using this function, the point of minimum cost operation is reached by handling 114.5 cwt of potatoes per week. This is approximately equal to actual quantity of potatoes handled by wholesalers-- 115 cwt. This implies that wholesalers are operating near the minimum average cost. Thus, to handle a much larger volume of potatoes would increase costs (e.g. transportation) and reduce returns. To expect the wholesalers to handle more potatoes, therefore, would require a reorganization of the wholesaling process to allow wholesalers to operate along a different cost function, representing a new scale of operation.

Summary

Wholesalers operating in the potato production-marketing system are not strictly engaged in wholesaling, rather a significant portion of their total volume, and thus income, is derived from retail sales. The ease of access that the consume has to the wholesaler discourages specialization in wholesale functions; instead of improving their

wholesale operation to reduce risks, the retail side of their business provides a form of insurance against unforeseen fluctuations. It also allows for fuller utilization of fixed assets (e.g. stalls). Furthermore, by operating as small wholesale-retailers they are able to service large numbers of small-volume retailers.

Wholesalers appear to be very traditional in their outlook and not especially innovative in their operations. They provide some storage of one to two days, as they bulk break potatoes into convenient sized lots for retailers. Although wholesalers sell on credit, they also purchase on credit, thus, the risk is passed on to the assemblers. However, since the grower sells to the assembler on credit, it is really the growers who finance the system's operation through deferred payments to them by assemblers.

Wholesalers do, however, attempt to coordinate their operations. Half of the potatoes they receive are through trade based on regular arrangements with assemblers. Likewise, wholesalers regularly sell 70 percent of their wholesale volume to the same retailers. As a result of these arrangements, the wholesaler operated efficiently within this small scale framework. Without changing the scale of operation, he could not readily increase the volume he handles without augmenting costs.

With the wholesalers operating near their most efficient level, assemblers are forced to adjust their operations to the volume limitations imposed upon them at this level in the distribution channel. In Chapter VI it was shown that assemblers are operating below their most efficient level--i.e., point of least cost operations. It is suggested that the small scale operations of the wholesalers by limiting the volume of potatoes that the system handles has caused the rest of the participants to face higher costs and lower returns.

It is the wholesale level in the vertical marketing channel where both the SFSS and LFSS merge selling to the same wholesalers; the nature of this trade, however, is different for the two sub-systems. Most of the regular or fixed arrangement trade is between large assemblers and wholesalers. Since: 1) approximately half of what wholesalers purchase is through fixed arrangements, and 2) that amount approximates what is sold to retailers through a regular trade relationship, it may be assumed that much of the LFSS trade is highly coordinated throughout the marketing system, and involves relatively low risks. SFSS trade accounts for a large portion of the exchanges not based on regular trading relationships. Furthermore, due to the highly inelastic demand for potatoes and large price fluctuations, the relatively poorly coordinated trade within the SFSS involves greater price risks. It may be concluded that although both SFSS and LFSS trade is limited by small scale wholesale operations, LFSS participants have been able to adopt different institutional arrangements for trade which enable them to reduce system costs and risks.

CHAPTER VIII
PRICES AND MARGINS IN THE POTATO
PRODUCTION MARKETING SYSTEM

Price Fluctuations

Since 1964, potato prices have risen at a slightly faster rate than the general consumer price index. Potato prices have risen by 90 percent while the Consumer Price Index rose by 82 percent.¹

Seasonality

Seasonality of production characterizes Costa Rican potato production. September and October are the months of largest supply, while January is known for its short supply. September-October and January, consequently, are the months of highest and lowest potato prices, respectively (Table VIII-1). Using a Spearman rank correlation coefficient,² the seasonal potato harvest index in Table VIII-1³ was found to be correlated at the .05 significance level with both the wholesale potato price index (-.67) and the retail potato price index (-.81). The relatively high fluctuations, however, between high and low potato prices

¹Since farm level data was not available, wholesale prices, as reported by the Banco Central in unpublished records, were used to construct the index. The consumer price index was constructed using unpublished records of the Departamento de Estadística y Censos.

²William Mendenhall, Introduction to Probability and Statistics, 3rd ed. (Belmont, Ca.: Duxbury Press, 1971), pp. 388-90.

³It is recognized that using data from one year makes comparison difficult. This, however, is the only reliable estimate of monthly change in production available, and while it is for just one year it, nevertheless, is considered representative of actual seasonal production.

Table VIII-1. Monthly Wholesale and Retail Price Index and Index of Potatoes Harvested

Month	Wholesale ^a Price Index (1964-1972)	Retail ^a Price Index (1952-1972)	Index of ^b Potatoes Harvested 1974
January	1.275	1.146	0.317
February	1.101	1.099	0.420
March	1.055	1.037	1.745
April	0.947	1.039	0.630
May	1.013	0.988	0.777
June	1.061	1.056	0.965
July	0.995	1.058	0.812
August	0.858	0.980	0.757
September	0.767	0.838	2.060
October	0.828	0.831	1.923
November	0.983	0.908	1.122
December	1.110	1.066	0.471

Sources: ^a Juan Manuel Villasuso and Alvaro Vargas, Indices Estacionales de los Precios al Por Mayor y al Por Menor de 18 Frutas y Hortalizas en Costa Rica (San Jose: IFAM-PIMA, 1973), p. 80.

^b Information presented by Ing. Nelson Montero to the Costa Rican Congress Committee on Social Affairs, Oct., 1975.

at the wholesale and retail levels--66 percent and 37 percent, respectively--resulted from periods of chronic over and under supply due in part to the fact that potatoes were not stored at harvest time for consumption in subsequent periods.

Price Cycles

An attempt was made to estimate cyclical movements in the wholesale price of potatoes by constructing a 12-month moving average⁴ for the 10 year period from 1964-1974 (Figure VIII-1). Since the data base covered a relatively short time span, it is difficult to draw any definite conclusions. There appears to be, nevertheless, a cyclical price pattern similar to that of two and four years reported by Shwedel and Elizondo⁵ for retail prices.

Price Movements at Different Levels in the System

Farm level. Prices at the Cartago market are characterized by wide weekly fluctuations⁶ (Figure VIII-2). The average price change from week to week is ¢8.17 per cwt, however, there are week to week fluctuations as high as ¢27.78 per cwt. The average price between August 1974 and August 1975 was ¢82.70 per cwt, thus the average weekly price fluctuation was equal to 9.9 percent of the average price. The standard deviation calculated from the weekly price data, however, was equal to 36.7. Dividing the standard deviation by the average price, a ratio is obtained which may be used to measure the variability of farm level

⁴A 12-month moving average is "a yearly average moved up a month at a time . . . to represent the trend-cycle base," William A. Spurr and Charles P. Bonini, Statistical Analysis for Business Decisions (Homewood, Ill.: Richard D. Irwin, Inc., 1967), pp. 512-513.

⁵Kenneth Shwedel and Victorino Elizondo, Estudio de Mercadeo de la Papa en Costa Rica y Posibilidad, Utilidad y Viabilidad de la Union Regional de Cooperativas de la Provincia de Cartago (San Jose: INFOCOOP/AID, 1976), p. 3.

⁶Cartago market prices were taken from the records of the Tierra Blanca Cooperatives. During the period in which they sold their members' production, they received potatoes at the Cartago price. This data is the only known source of farm level prices.

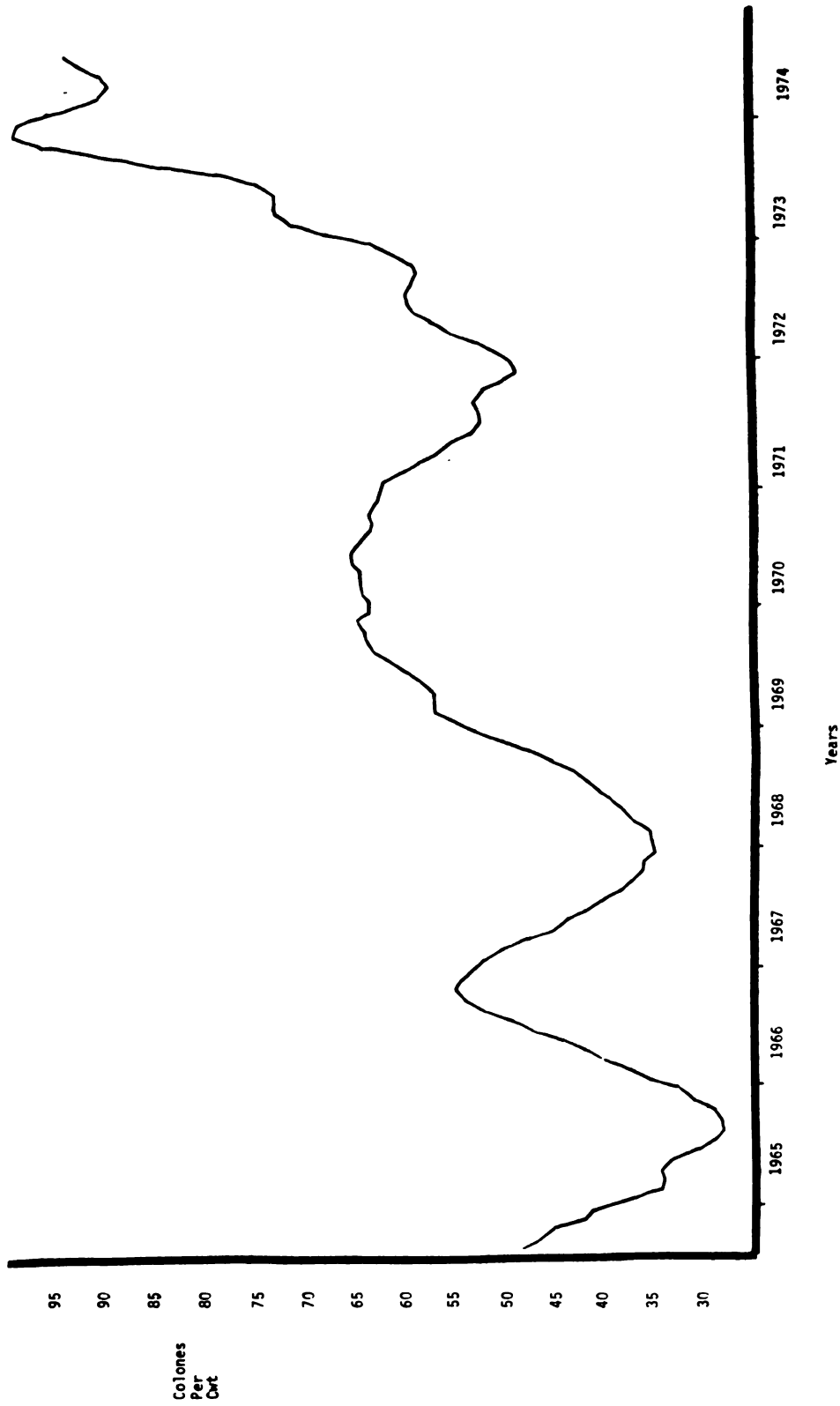


Figure VIII-1. Monthly Moving Average of Wholesale Potato Prices, 1964-1974.

Source: Banco Central, unpublished records.

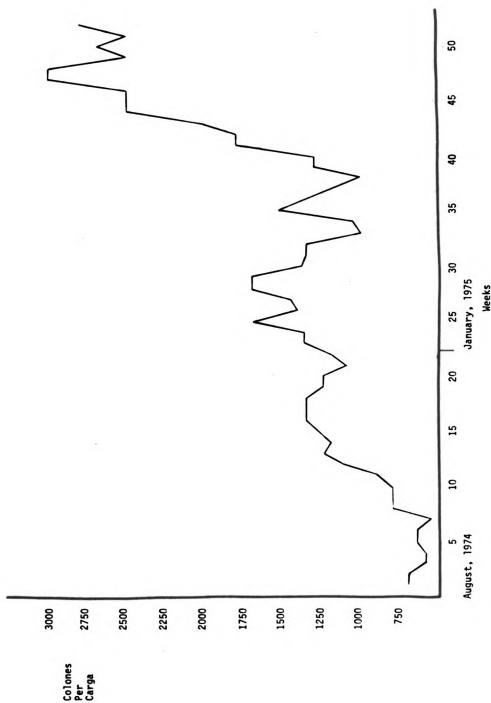


Figure VIII-2. Weekly Potato Prices at the Cartago Market, August 1974 - August 1975.

Source: Tierra Blanca, unpublished purchase records.

potato prices. Thus, the larger the ratio, the wider the range of prices around the mean price, implying that the market was characterized by large price fluctuations.⁷ In the case of the Cartago market, this ratio was equal to 44.4 percent.

While there are definite seasonal patterns in price movements, week to week fluctuations show no dominant tendency for prices to move in one direction or another, nor to remain stable. During the course of the year from August 1974 to August 1975 there was no period longer than three weeks where price movements were constant in one direction. The weekly instability reflected in the magnitude and directions of price flexibility makes planning difficult. It also means that accurate information on price fluctuations will result in large gains for growers.

Assembly level. Prices paid to assemblers by wholesalers are also characterized by frequent weekly price fluctuations, but these are not as volatile as in the Cartago Market (Figure VIII-3). Using the prices paid by the National Production Council (CNP) for potatoes at the San Jose Wholesale Market, the average 1975 price paid to assemblers was \$101.98 per cwt. Calculating the ratio of the standard deviation (37.06) to the average price, the result was 36.34 percent. The reason that wholesale prices are less volatile when compared with farm prices relates to: 1) assemblers provide marketing services whose costs are relatively stable, 2) assemblers may have made short-term inventory adjustments which would dampen price fluctuations, and 3) the size of the assemblers' markups vary inversely with supply conditions.

⁷David L. Peacock and Hectar Sarmiento, "Price Fluctuations in the Domestic Market for Fresh Produce," USAID Staff Paper, Bogota, Colombia, 1974. (Mimeographed.)

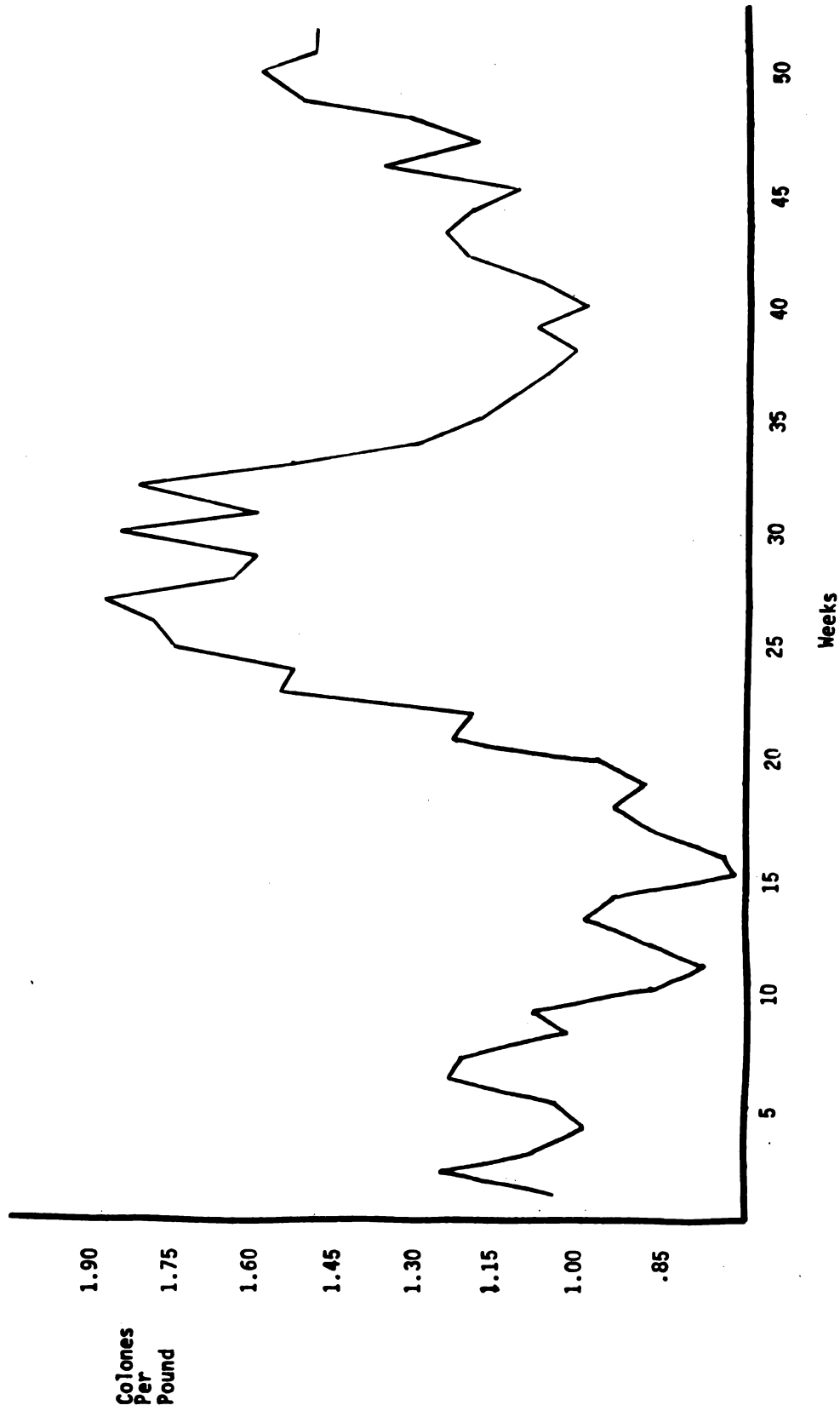


Figure VIII-3. Weekly Prices Paid to Potato Assemblers in the San Jose Wholesale Market, 1975.

Source: National Production Council, unpublished purchase records.

Daily and weekly prices paid to assemblers show no dominant tendency to move in one direction nor the other. Between August 1974 and August 1975, however, there was one period of sustained increases in price followed, shortly, by a period of sustained decreases in price. Daily prices at the beginning of the week were compared with those at the end of the week for 1975. During 34 percent of the weeks prices rose, while during 36 percent prices fell, the other 29 percent of the time prices closed at the same level at which they began the week. Differences between the high and low prices within a given week fluctuated by as much as 26.1 percent. This was in September when most small farmers were selling potatoes.

Retail level. At the retail level, the average 1974 monthly price was ¢1.41 per pound,⁸ with a standard deviation of .39. Taking the ratio of these two, gives 27.7 percent variation around the average price. This is lower than at the other two levels, as would be expected since at each level in the channel more marketing services are added.

Potatoes Compared with Other Crops

Using the standard deviation alone as a measure of market volatility, potato prices, compared with those of other fruits and vegetables, are among the most volatile (Table VIII-2). However, when potato prices are compared with other crops grown in the Cartago area, they appear to be, except for beets, relatively more stable.

⁸This is based on unpublished information gathered by the Direccion General de Estadistica y Censos.

Table VIII-2. Standard Deviation of the Wholesale and Retail Price of Ten Fruits and Vegetables in Costa Rica, 1964-1972

Product	Standard Deviation of Wholesale Prices	Standard Deviation of Retail Prices
Onion	0.596	0.493
Lettuce	0.250	0.184
Oranges	0.444	0.378
Potatoes	0.301	0.270
Papaya	0.288	0.270
Pineapple	0.178	0.177
Beets	0.240	0.213
Tomato	0.386	0.342
Yuca	0.185	0.166
Carrots	0.375	0.262

Source: Juan M. Villasuso, Intermediarios y Margenes de Comercialización de Productos Agrícolas en Costa Rica (San Pedro, Costa Rica: Universidad de Costa Rica, 1976), p. 34.

Marketing Margins and Returns

Size of Margins

The actual size of assembler gross margins varied throughout the period of August 1974 - August 1975 from ¢4.32 to ¢38.27 per cwt; the mark-up on potatoes varied from 4.1 percent to 58.5 percent (Table VIII-3). The margin at the assembly level during this period appeared to be calculated neither by adding a fixed percentage nor a fixed cost to the purchasing price. Rather, the size of the mark-up was negatively

Table VIII-3. Cartago Market Price, Prices Received by Assemblers, Gross Margins and Assembler Markup per Cwt, August 1974 - August 1975

Month	Cartago Market Price ^a (colones)	Prices Received by Assemblers ^b (colones)	Gross Margins (colones)	Markup (percent)
August	36.37	57.50	21.23	58.5
September	38.81	56.25	19.44	50.1
October	50.03	70.00	19.97	39.9
November	72.24	102.50	30.26	41.9
December	66.67	92.50	25.83	38.7
January	80.56	109.00	28.44	35.3
February	86.46	115.00	28.54	33.0
March	69.74	88.40	18.66	26.8
April	66.75	84.20	17.45	26.1
May	104.38	108.70	4.32	4.1
June	152.80	166.00	13.20	8.6
July	141.67	173.00	31.33	22.1
August	108.73	147.00	38.27	23.9
AVERAGE	82.70	105.39	22.84	31.5

Sources: ^aTierra Blanca Cooperative, unpublished purchase records.

^bNational Production Council, unpublished purchase records.

correlated with the relative price level (-.77).⁹ This implies that assemblers varied their margins in response to changing supply conditions which had the effect of dampening, somewhat, price fluctuations, but also of spreading out the returns to their operation over the year.

Detailed wholesale and retail price information was not available for the comparable period of August 1974 - August 1975, therefore, the two levels were grouped for analytical purposes (Table VIII-4). As with assemblers, the gross margin and mark-up varied in size throughout

⁹A Spearman rank correlation coefficient was used to test the relationship between price and mark-up and was significant at the .01 level.

Table VIII-4. Prices Paid to Assemblers, Received by Retailers, Gross Margin and Markup per Cwt, August 1974 - August 1975

Month	Price Paid to Assemblers ^a (colones)	Price Received by Retailers ^b (colones)	Gross Margin (colones)	Markup (percent)
August	57.50	87.20	29.70	51.7%
September	56.25	N.A.	--	--
October	70.00	96.61	26.61	38.0
November	102.50	116.80	14.30	14.0
December	92.50	121.30	28.80	31.1
January	109.00	148.30	39.30	36.1
February	115.00	146.80	31.80	27.7
March	88.40	123.00	34.60	39.1
April	84.20	120.10	35.90	42.6
May	108.70	133.20	24.50	22.5
June	166.00	191.80	25.80	15.5
July	173.00	206.80	33.80	19.5
August	147.00	196.70	49.70	33.8
AVERAGE	105.39	140.71	31.23	25.8

Sources: ^aNational Production Council, unpublished purchase records.

^bDirección General de Estadística y Censos, unpublished records.

the year. Likewise, the size of the mark-up was negatively correlated with the relative price level (-.72).¹⁰

Returns

Farm level. Using the price information presented in this chapter and in Chapter V the average 1974-1975 price paid to small farmers and large farms per cwt was ¢77.01 and ¢78.79 respectively. The cost of production, was ¢68.16 per cwt for small farmers and ¢57.44 per cwt for large farmers. This represents a return of ¢8.85 or 13 percent on the

¹⁰A Spearman rank correlation coefficient was used to test the relationship, and it was found to be significant at the .02 level.

small farmers' investment. For the large farmers, the return was equal to ₡21.35 or 37.2 percent on their investment.

Assembler level. The average 1974-75 price paid to assemblers was ₡105.39 per cwt. To calculate the operating costs, data presented in Chapter VI was used. The costs of operation was ₡7.35 per cwt for the small assembler and ₡6.07 per cwt for the large assembler. This resulted in net average return (i.e. less the cost of the potatoes) of ₡21.03 for the small assembler and ₡20.53 for the large assembler.

To calculate the rate of return on investment presents a problem as to whether or not to include the value of the potatoes as part of the assemblers' investment. The assemblers appear to operate as brokers, since they pay the farmer only after the potatoes are sold. Furthermore, to conclude that the assemblers receive the potatoes on credit is not completely accurate. During the course of the research for this study one person who was not an established assembler was trying to purchase potatoes on the Cartago Market. The price he paid in cash was essentially the same as the assemblers eventually paid large growers. Thus, it may be concluded that capital for purchasing potatoes was free to the assemblers. The rates of return, therefore, as presented in Table VIII-5 under the two alternatives: 1) potatoes as free to the assembler; and 2) potato costs included in the assembler's total cost.

Wholesale level. Using the assumptions regarding the size of the wholesale mark-up discussed in Chapter VII, it was possible to estimate an average 1974-75 wholesale and retail price--₡124.78 per cwt and ₡1.41 per pound, respectively. Since wholesalers sold both to retailers and to consumers, a weighted price received by wholesalers was calculated for the two market locations--₡131.98 for wholesalers in the Borbon

Table VIII-5. Rate of Return to Assemblers Under Different Capital Investment Assumptions for Potato Costs, by Size of Assembly Operation

Size	Potatoes Free to Assembler (percent)	Potato Costs Included in Total Costs (percent)
Small	286	24.9
Large	338	24.2

Source: Assembly level survey for this study.

Market area and ¢126.04 for those located at the San Jose Wholesale Market. Using the costs presented in Chapter VII the return was equal to ¢16.44 in the Borbon Market area and ¢13.40 in the San Jose Wholesale Market. Since wholesalers purchased a portion of the potatoes in cash and received the rest on "credit" from the assembler, a weighted average was used to calculate the rate of return on investment for the wholesalers in the two locations. The return on investment was 64.4 percent and 48.2 percent in the Borbon Market area and the San Jose Wholesale Market, respectively.

Trends in the Size of the Margin. It appears that over time marketing margins have increased. Villasuso¹¹ demonstrated that retail potato margins rose over the period 1964-1972. Green and Alfaro's¹² data for 1958 show an average assembler margin of 12.5 percent. It is

¹¹Juan M. Villasuso, Intermediarios y Margenes de Comercialización de Productos Agrícolas en Costa Rica (San Pedro, Costa Rica: Universidad de Costa Rica, 1976), p. 25.

¹²R. E. L. Green and Gregorio Alfaro, Pattern of Movement and Prices of Potatoes, San Jose Market, November 1958 to October 1959 (San Jose, MAC/STICA, 1960), p. 23.

suspected that the increase is due to rising costs rather than a change in the behavior of the middlemen. Between 1958 and 1974, the Consumer Price Index rose from 87.62 to 181.96 (1964=100). While the Consumer Price Index does not say anything specifically about potato marketing costs, it does show that the general price level rose during this same period. There is no reason why the costs of marketing should not have followed that same trend.

Summary

Prices in the potato production-marketing system have increased over the ten year period from 1964 to 1974. Seasonal fluctuations, which characterize the potato market, result in the lower prices during the period when small farmers are most likely to be on the market. The small farmer's price position is further deteriorated by the fact that assemblers vary the size of their mark-up inversely to the market price, thereby spreading their costs and returns over the entire year. In periods of high prices they barely cover their costs, sometimes operating at a loss. When the supply of potatoes on the market increases causing prices to fall, they widen their mark-up. Thus, the small farmers, who are most likely to be selling during periods of large supply, are in effect, subsidizing the operation of the distribution system for the periods when large farmers are most likely to be on the market. This results in an income transfer from small growers to large growers, thereby further disadvantaging small farm agriculture.

In response to wide and uncertain price fluctuations which characterized the potato market sub-system, large and small growers were found to adopt different strategies to reduce risks (see Chapters IV and V). Small farmers tend to maintain traditional practices, which in

effect, result in most small farmers simultaneously entering and exiting the market causing large price fluctuations. Small farmers also are more likely to plant other crops besides potatoes, yet prices for these products are more volatile than potato prices. Since there is a probability for a higher return for these other crops, however, the small farmer seemingly uses this as a hedge against low potato prices.

The large farmers, on the other hand, were found to adopt a strategy of vertical coordination, thereby reducing market uncertainties and increasing average prices received. This also reduced the marketing costs per cwt for the LFSS.

The rate of return on small assembler operations is approximately equal to that of large assembler operations. By paying a lower price for potatoes to small farmers, the small assembler is able to overcome higher per unit costs. Thus, small farmers are subsidizing assembly level inefficiencies.

CHAPTER IX
CONCLUSIONS AND RECOMMENDATIONS FOR THE COSTA
RICAN POTATO PRODUCTION-MARKETING SYSTEM

In Chapter II a set of hypotheses were put forth in order to identify sources of differences between the LFSS and SFSS, as well as to point out where these differences could possibly place the SFSS at a disadvantage vis a vis the LFSS. In this chapter, these hypotheses will be examined based on the information presented in Part II. From the examination of the hypotheses, policies and programs will be recommended, which, it is suggested, will improve the position of small farm agriculture within the Costa Rican potato production-marketing system.

Examination of the Hypotheses

This study has attempted to demonstrate that small farmers operate and trade within a sub-system separate from that which characterizes large farm operations and trade. The differences in the sub-systems were hypothesized to relate to differences in participant resources and perceptions, as well, as to differences in institutional arrangements governing exchange. Arising from these differences would be a divergent behavior on the part of the participants of the two sub-systems. This, in turn, would result in dissimilar sub-system performances. The major differences between the two sub-systems identified in the study are summarized in Table IX-1.

Table IX-1. Comparison of Major Characteristics of Small vs. Large Farm Sub-Systems

Characteristic	Small Production Marketing Sub-System		Large Production Marketing Sub-System	
	Small Farmers	Small Assemblers	Large Farmers	Large Assemblers
Resources				
-Education	Low (1-4 years)	Low (1-6 years)	High (5 years or more)	High (4 years)
-Market Knowledge	Low	Medium	High	High
-Land & Capital	0-10 Manzanas-- (mostly owned)	Low	10 or more Manzanas-- (owned & rented)	Low
-Access to Credit	Limited	Limited	Good	Limited
-Access to Inputs	Good (except seed)	N.A.	Good	N.A.
-Influence on Policy Makers	Low	Low	High	Low
Attitudes				
-Future Orientation	Low	Somewhat	Somewhat	Somewhat
-Fatalism	High	High	Low	Low
-Trust-Non Family	Low	Low	Somewhat	Somewhat
-Innovation & Change	Low	Low	Somewhat	Somewhat
Behavior				
-Specialization	Product Diversification	Product Diversification	Product Specialization	Product Specialization
-Economic Goals	Stable Income	Profit Maximization	Profit Maximization	Profit Maximization
-Risk Aversion Strategy	Customary average harvest when ready, produce & market 2 months of year	Amount he can sell --no agreements	Adjust acreage with assembler, before harvest get assembler advice, produce & market 4 months or more of year	Guarantee Whole-salers stable supply, and advise supplier

Table IX-1. Continued

Characteristics	Small Production Marketing Sub-System		Large Production Marketing Sub-System	
	Small Farmers	Small Assemblers	Large Farmers	Large Assemblers
-Level & Quality of Market Information	Low	Low	High	High
-Recognition of Community of Interest with Assembler	Low (45% sell to same assembler)	Low	High (76% sell to same assembler)	High
-Stable Pre-Arranged Sales Agreements	Few	Few (16% of total amount)	Many	Many (52%)
-Product Sample Inspection	Necessary	N.A.	Not Necessary	N.A.
-Size of Overage Sale (cwt.)	79	13	217	36
Performance				
-% Use Washing Drying Capacity	N.A.	50%	N.A.	96%
-Perception of Assembler Buyer or Farmer Seller	Friend or Relative	Friend or Relative	Businessman	Businessman
-Yield per Manzana (cwt.)	220	N.A.	227	N.A.
-Weekly Volume Handled (cwt.)	N.A.	192	N.A.	453
-Costs of Operation Colon per Cwt.	¢68.16	¢7.35	¢57.44	¢6.07
-Average Price Received Colon per Cwt.	¢77.01	¢105.39	¢78.79	¢105.39
-Net Returns	¢8.85	¢21.03	¢21.35	¢20.53

N.A. = Not Applicable

Source: Kelly M. Harrison and Kenneth Shwede1, "Marketing as a First Generation Problem of Small Farmers: A Costa Rican Case," paper presented at the DECD/FAO International Seminar on Critical Issues on Food Marketing Systems in Developing Countries, Paris, Oct. 18-22, 1976.

Participants

It was hypothesized that differences with respect to the individual participants would relate to: 1) resource control; 2) perceptions; 3) modernity; and 4) position. The participants in the Costa Rican potato production-marketing system, however, appear to be a relatively homogenous group. They are concentrated in the same general geographic area and possess the same ethnic and cultural background. Wide variation in land size, which would dicotomize farms along minifundia and latifunda lines, is also absent. Nevertheless, there are definite differences between the participants of the large farm vs. small farm sub-systems, which, as will be seen, contribute to variance in the performance of the two sub-systems by defining and placing limits on the range and quality of alternatives available to each group.

The LFSS participants appear to have more and "better" resources under their control. With respect to the inputs for the production process, the large farmers are able to achieve a superior position by their production of potato seeds. They are able to satisfy their needs with the best quality seeds and/or sell or use remaining seeds as part of a crop sharing arrangement. By using the seeds as part of a crop sharing arrangement, the large farmer has been able to time his entry into the market to coincide with higher product prices.

With respect to other inputs, except for the use of tractors and land area, there is little difference between the two groups of farmers. It should be pointed out that large farmers are most likely to use tractors. Similarly, many of the large farmers who own tractors and oxen often rent them to other farmers.

Assemblers are also differentiated by the control of inputs. Large assemblers are more likely to have electric fans and a larger area for drying potatoes. This has permitted them to handle a large volume of potatoes. Furthermore, by being able to handle a large flow-through, the fixed costs per unit are significantly reduced.

T. W. Schultz has stated that "the acquired capabilities of farm people . . . like capital goods, are produced means of production."¹ Variation, therefore, in the levels of human capital are important in differentiating between the two sub-systems. For both farmers and assemblers, the LFSS participants have a higher level of formal education than those of the SFSS.² But, more important is the difference in the level of market knowledge. The SFSS participants have a poorer understanding of the structural variables of the potato marketing system, and their knowledge of current market conditions is limited.

Knowledge is acquired, i.e., "skills and related knowledge can be improved and enhanced throughout life."³ It is suggested here that participants of the LFSS have purposefully undertaken investment activities to improve their level of human capital. The large farmers are present at the Cartago marketplace every Sunday whether or not they have potatoes to sell. In this case, the cost of acquiring this increased human capital was lower for the large farmers since they often live in Cartago.

¹Theodore W. Schultz, Transforming Traditional Agriculture (New Haven: Yale University Press, 1964), p. 175.

²Huffman in a study of education on decision-making concludes that those "with more education are able to grasp changes quickly and adjust more quickly and accurately to them." Wallace E. Huffman, "Decision-Making: The Role of Education," American Journal of Agricultural Economics 56 (February 1974): 86.

³Schultz, p. 175.

Differences between the level of knowledge, in part, indicate that the two groups hold a different perception of the potato production-marketing system. Furthermore, differences in perception relate to the participants' "general orientation towards the basic aspects of life."⁴ This orientation or value set has often been conceptualized in terms of modern versus traditional attitudes. These concepts represent abstractions or ideal types⁵ which provide an indication as to one's thinking and feelings, as well as to ways of doing and organizing.⁶ While other socio-economic variables are often the overriding determinant in participant behavior, those who tend to hold modern opinions also tend to behave in a manner consistent with these attitudes.⁷

Comparing the participants of the two sub-systems, it was seen that the SFSS participants tend to be somewhat more traditional than LFSS participants in their attitudes. Assemblers demonstrate, as a group, a more modern set of values. However, the large assemblers appear to hold attitudes more in common with large farmers than with small assemblers. It was not possible to clearly identify differences in role nor in position between the participants of the two sub-systems.

Institutional Framework

Although farmers and assemblers from both the SFSS and LFSS trade in the same marketplaces, it was hypothesized that: 1) trade would be

⁴Joseph A. Kahl, The Measurement of Modernism: A Study of Values in Brazil and Mexico (Austin: The University of Texas, 1968), p. 9.

⁵Ibid., p. 3.

⁶Alex Inkeles and David H. Smith, Becoming Modern: Individual Change in Six Developing Countries (Cambridge: Harvard University Press, 1974), p. 16.

⁷Ibid., p. 259.

overwhelmingly with other participants of the same sub-system; and 2) exchange within each sub-system would be characterized by a different institutional framework. The differences in the institutional framework of the two sub-systems were said to relate to: 1) exchange rules; 2) acquisition of information; 3) risks; 4) conditions of entry; and 5) scale of operation.

Table IX-2 shows the trade between farmers of each sub-system and first buyers. The large farmers are least likely to seek alternative outlets for the production (i.e., direct selling in San Jose). Small

Table IX-2. Percentage of Farmers Selling to Alternative First Buyers

	Large Assemblers (percent)	Small Assemblers (percent)	San Jose Wholesaler (percent)	Total
Small Farmers To	19	60.3	20.7	100
Large Farmers To	80	14.9	5.1	100

Source: Farm level survey and Assembly level survey for this study.

farmers sell most of their potatoes to small assemblers, but they also use alternative outlets. Small farmer-large assembler trade is often the result of long standing friendships of small farmers with large assemblers of lived and worked in the same rural areas. Selling directly in San Jose is considered to be a form of employment for the farmer whose opportunity costs are temporarily set at zero. Thus, when small farmers trade outside of their sub-system it is not necessarily the result of dissatisfaction resulting from intra-sub-system trade.

The arrangement for trade varies between sub-systems. LFSS trade is characterized by an informal set of agreements between farmers, assemblers, and wholesalers, thereby establishing fixed trading partners. While this is essentially an informal arrangement, it is not uncommon for information and advice to be exchanged for the common benefit of the trading partners.

Trade within the SFSS takes place without extensive use of informal arrangements. Small farmers and assemblers, as a result, operate under conditions of greater uncertainty with respect to assured outlets and sources of supply. The free flow of market information and advice is absent. This may account, in part, for the inaccurate knowledge of the market system by SFSS participants.

The SFSS is less stable in terms of the composition of its participants. Between 1963 and 1973, the number of small farmers increased, while the number of the largest farmers remained constant. Likewise, for assemblers entry into the SFSS is relatively easy. The fact that there are frequently new and different growers and assemblers trading in the marketplace makes it difficult to develop a highly coordinated sub-system based on informal agreements for trade. In the LFSS, on the other hand, the same group of assemblers and growers continually trade with one another, thereby facilitating the establishment of informal arrangements for coordinating trade. The same situation exists at the assembler-wholesaler level. Large assemblers are well known and always visible, encouraging wholesalers to enter into relationships with them for the supply of potatoes.

The size of operation varies between the two sub-systems. Large growers, producing more, also sell in larger size units. Large assemblers, likewise, handle more potatoes and in larger lots.

The difference in the scale of operation and the condition of entry also relate to other institutional differences in trading arrangements. Physical inspection of the potatoes is more prevalent in the SFSS since neither farmers nor traders have the confidence in one another that exists among LFSS participants. Trade between small assemblers and wholesalers is more likely to be conducted on a cash and carry basis. Partly this is due to the assembler's lack of confidence in the wholesaler, but also it is due to the necessity of paying cash for the shipment of his potatoes to San Jose. These differences in trading arrangements, furthermore, work to limit the amount of cross sub-system trade.

The importance of informal agreements for coordinating sub-system activity should not be underestimated as they represent a movement towards an actively coordinated vertical commodity channel. Similar behavior is found in other parts of the world. A study of the Michigan potato industry found that "chip processors have long maintained verbal agreements with potato growers or shippers"⁸ and that they were paid according to the going market price. From this verbal arrangement, Michigan growers and processors are now moving to written contracts.

Behavioral Relationships

As a result of differences in participants and institutional arrangements, it was hypothesized that differential behavioral patterns would emerge for each sub-system. Differences in participant behavior were said to center around: 1) risk aversion strategies; 2) organization of economic unit and trade activities; and 3) reaction to poor system performance.

⁸Kelly M. Harrison, Stephen O. Sparks and M. Fabre, The Michigan Potato Industry: A Market Analysis, Agricultural Economics Report No. 294 (East Lansing: Michigan State University, 1976), p. 16.

The factors which discourage the development of informal arrangements for trade within the SFSS were identified above. As a result, the SFSS was said to be operating under conditions of higher risks and greater uncertainty. To protect themselves, the SFSS participants have developed a set of standard operating procedures which emphasize risk reduction. The small farmers, for example, undertake more crop production enterprises than large farmers.

Small growers were seen to have less knowledge regarding prices and price movements. The fact that they make their decisions based on custom appears to be a technique designed to protect themselves from price uncertainties. In the face of the uncertain economic conditions which prevailed at the time of this study, for example, the small farmers planned to follow the same production strategy for the 1975-76 crop as for the previous years' crops. Large growers, by way of contrast, vary the land area dedicated to potatoes according to their perception of potato market conditions. Furthermore, the large growers, more aware of price movements, were seen to follow a strategy which allows them to sell potatoes throughout the year.

The SFSS appear less willing to engage in new activities to improve performance. The use of fans by assemblers is a case in point. Direct deliveries to supermarkets represents a new way of organizing trade which is practiced almost exclusively by the large assembler. Large and small growers show little difference with respect to innovative production related activity.

Performance Characteristics

Performance, being the stream of consequences ensuing from participant behavioral patterns, was, therefore, hypothesized to be different

for each sub-system. Differences were said to relate to: 1) cost and returns; 2) production levels; and 3) stability of supply. Furthermore, it was suggested that differences in performance are, in part, the result of the LFSS's ability to lower and shift the cost of externalities generated by the production-marketing system. To best evaluate the performance hypotheses, it is necessary to examine the performance of the entire potato production-marketing system as well as that of the two sub-systems.

System Performance

While the total population, the percentage of urban dwellers and real per capita income all have grown, per capita potato production has decreased. Certain technical and natural phenomena may, in part, account for the failure of potato production to keep pace with expanding potential demand. The high cost and poor quality of potato seeds is a major production-related bottleneck. The seasonality of production combined with a lack of storage facilities works against the regular release of potatoes onto the market.

Market-related variables also impede the orderly functioning of the system. Knowledge of price levels and movements is low among all participants. Additionally, there are wide weekly fluctuations in price which force growers to operate within an uncertain environment. Assemblers, likewise, face large weekly and daily price fluctuations in wholesale markets.

Although prices were rising, costs were also rising at a faster rate than potato prices, which lowered returns to potato production.⁹ This price policy of assemblers and wholesalers who vary the size of their margins throughout the year--being largest during the months of high production--and an inelastic demand for potatoes, interact to further reduce the returns of potato producers who are on the market during periods of large supply, i.e., the small farmer.

There has been no attempt to change the nature of the demand for potatoes. The wholesalers, except for the practice of varying marketing margins, do not undertake any specific activities to promote the consumption of potatoes. The only area where some innovation may be said to have taken place is in a few retail establishments which sell potatoes in pre-packed five-pound polyethelene bags.

The inability of the marketing system at the wholesale level to handle large volumes of potatoes limits the ability of farmers and assemblers to expand production. Furthermore, the nature of wholesale and retail operations, i.e. large numbers of merchants each trading in small lots, discourages the introduction of many managerial and technical innovations which could lower the costs of potato marketing. Compared with poor performance elsewhere in the system, transactions between farmers and assemblers at the Cartago market result in some efficiencies in the marketing system. Buyers and sellers are able to visually

⁹Between 1957-58 and 1974-75 production costs have risen faster than potato prices thereby lowering the rate of return. Expressing the colon difference between costs and price in real terms (1964=100), the colon return on investment has dropped from ¢16.90 to ¢10.10. R. E. L. Green, An Economic Study of the Production and Marketing of Potatoes in Costa Rica (San Jose: STICA/AID, 1958); Tierra Blanca Cooperative, Purchase records; Farm level survey for this study.

estimate the quantity that is available by the number of growers who have arrived to sell. Information flows freely among both groups in the hour prior to trading. For the assemblers, the Cartago market allows them to purchase potatoes without actually having to go from farm to farm to negotiate transactions. By arranging the quantity and date of pick-up, the assembler is able to organize his operation to maximize the use of his managerial time and equipment. The grower is also able to better plan, knowing the day that he must ready the potatoes for pick-up. Transactions in the Cartago market, however, have resulted in growers assuming most of the short-run risk-bearing function for the entire system. Yet as will be seen, this risk is not evenly shared by all growers.

Sub-System Performance

The LFSS's extensive use of informal agreements for trade between participants allows for greater vertical coordination, and has permitted the LFSS to reduce some of the risks and operating costs arising from inefficiencies within the potato production-marketing system. The SFSS, on the other hand, functions under conditions of higher risks and costs. The participants of the SFSS, not having formed similar relationships, have adopted different strategies to cope with potato production-marketing system inefficiencies. These strategies, while allowing them to continue operating, have resulted in relative stagnation of this sub-system.

Figure IX-1, which represents a hypothesized demand curve for potatoes based on the discussion in Chapter III, demonstrates the effects of regular arrangements for trade. From A to B, the demand curve is very price elastic. At B, urban demand is satisfied, and the demand curve turns highly price inelastic until C at which point it becomes

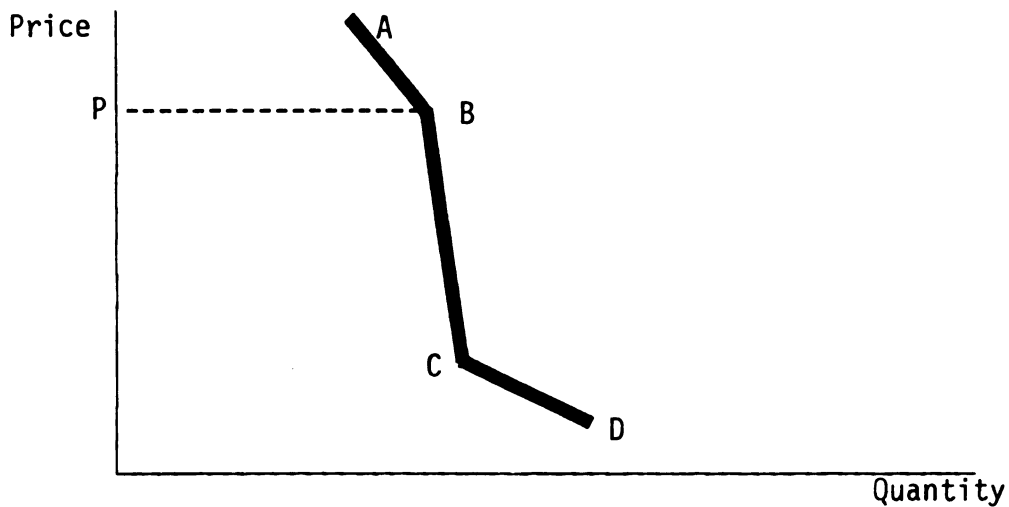


Figure IX-1. Hypothesized Demand Curve for Potatoes

profitable for truckers to handle potatoes for rural distribution. The amount of potatoes handled under regular arrangements would be given by a point closest to, but to the left of, B. Thus, those who supply potatoes through regular arrangements face the price elastic portion of the demand curve. On any given day, the potatoes handled under regular arrangements are received first, leaving the residual demand to be satisfied by the rest of the potatoes on the market. When total supply is greater than B, regular arrangement trade will result in a price near P, since wholesalers are willing to pay assemblers a premium in periods of large supply to maintain their informal supply relationship during periods of short supply. The rest of the trade will be along B-C or B-D. When total supply is less or equal to B, then all potatoes are traded along A-B. This would explain, in part, the fact that even in periods of over-supply the LFSS, which monopolizes regular arrangement trade, receives higher prices. It would also account for the small difference in price arising from the two sub-systems' trade during periods of scarcity.

By not entering into informal agreements to regularize trade the SFSS has placed itself at a comparative disadvantage. Trade along B-C being very price inelastic, results in larger price fluctuations relative to small changes in supply. Therefore, those who trade along this portion of the demand curve not only face lower prices, but also must deal with larger fluctuations in price, under conditions of greater uncertainty. Small growers have reacted to these conditions by maintaining output at a constant level.¹⁰

Another area of difference in sub-sector performance relates to the relative bargaining power of large growers compared to the small growers vis a vis the other participants in the system. To negotiate from a position of strength requires that one be the only, or among the few, owners of something that the other party desires strongly, and/or be able to do harm to the other party if he does not honor his commitments. The large growers supply the market throughout the year. The assembler who wishes to be on the market throughout the year must depend on the large growers to assure a steady supply. Thus, large growers are in a position to demand higher prices--partly for the costs of their services and partly due to their negotiating strength. The small farmer, on the other hand, is not in a position to impose his will on the assembler. On the contrary, by entering the market during periods of peak production, the small grower has no special power over the assembler. Since small assemblers are on the market throughout the year, they also will deal at times with large growers for the supply of potatoes. To be able

¹⁰When there is no discernible pattern in price fluctuations or the patterns are unknown, one way in which returns may be maximized--assuming prices are randomly distributed around the mean--is by adopting a strategy which presupposes a mean price level and produce accordingly, i.e. maintain output at a constant level.

to pay the higher prices demanded by the large growers while operating at high per unit costs, small assemblers may make up the difference by paying lower prices and making larger discounts to small growers. Thus, the large farmer's relative strength over small assemblers results in an income transfer from small to large growers.

At the assembler-wholesaler level stability and mutual necessity have also influenced the nature of transactions so as to favor the LFSS. Wholesalers need a steady and assured supply of potatoes. The small grower who occasionally enters the wholesale market during times of large production is not a reliable source of supply. Small assemblers likewise appear to be unreliable sources of supply. Their numbers are changing and they are not physically in the San Jose Market on a daily basis. Furthermore, they require payment in cash. Large assemblers, on the other hand, are at the San Jose market almost daily offering a steady supply of potatoes on credit. This permits the wholesaler, by entering into a relationship with an assembler, to serve as a guaranteed source of potatoes and to provide credit to his retailer clientele. In return, the wholesaler serves as an assured outlet for the large assembler's potatoes even during periods of over-production. The large assembler by dealing with wholesalers through fixed relationships is able to reduce the time involved in negotiating transactions. This is a very important concern to the assembler who has to return to the wash house to supervise the collection and preparation of the next shipment of potatoes.

By entering into fixed relationships, the LFSS has been able to achieve scale economies. The source of these economies are two-fold. First, various organizational efficiencies are available. Buyers and sellers are able to routinize parts of the transaction process: 1)

extensive time need not be spent searching for clientele, 2) inspection of sample quantities does not take place, and 3) certain conditions of trade are previously known and accepted by all parties, e.g., credit sales. They are able to better plan their activities, thereby maximizing returns to managerial talents. Risks are also reduced since exchange on acceptable conditions is always available. Furthermore, the exchange of information between the participants at the different vertical levels permits LFSS participants to prepare themselves for short-run changes in the potato production-marketing system. Secondly, economies are achieved through the size of operation. Knowledge of assured sales allows the participants to develop larger size operations and thereby reduce fixed costs per unit handled. The size of each exchange is also larger which further reduces per unit transaction costs.

To see the effects of the different cost structures on the two sub-systems, the production and assembly cost functions,¹¹ presented in Chapter IV and Chapter VI, were summed (Figure IX-2).¹² The inclusion of marketing costs eliminates the production level advantage of the SFSS. It should be further noted that at the optimum sub-system levels of production, farm level production costs are approximately

¹¹Wholesale costs were excluded because there were difficulties comparing the scale of activities. Furthermore, the small size of the sample presented additional methodological problems to determine a sub-sector cost function.

¹²French and Gillette state that with regard to combining assembly and packing cost curves, "[T]he task now is simply one of addition." Ben C. French and D. G. Gillette, Cost of Assembling and Packing Apples as Related to Scale of Operation, Michigan Agricultural Experiment Station Technical Bulletin 272 (East Lansing: Michigan State University, 1959), p. 39.

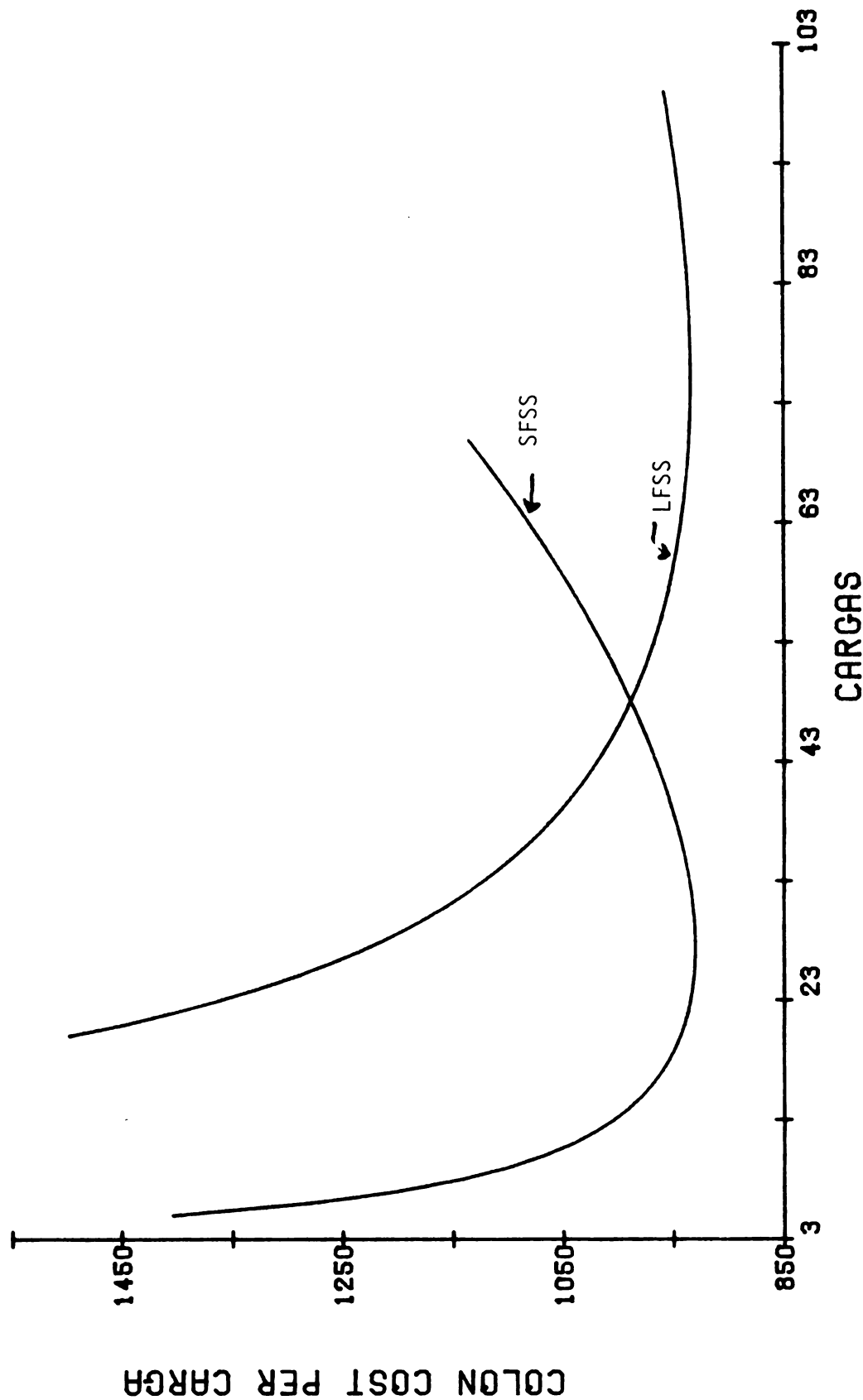


Figure IX-2. Average Cost Curves per Carga of Potatoes of the Small and Large Farm Sub-Systems.

Source: Table IV-7; Table VI-12.

equal.¹³ Since the marketing functions have such an important influence in determining the sub-sector cost structure, programs designed to reduce production costs along would result neither in a large relative nor absolute competitive advantage to the small grower, and may, in fact be most beneficial to large growers.

Finally, it was seen that differences in performance were related to the LFSS ability to influence the direction of system change in their favor. Until 1975, the only area-wide organization of farmers represented large grower interests. When the opinion of the potato growers was sought, it was this group which was consulted. The large farmers are the ones in closest contact with policy-makers and best able to take advantage of new programs and opportunities. They are also able to effectively lobby against government programs which they perceive to be harmful to their interests.¹⁴ This access to the decision-making structure has allowed them to shape, somewhat, the direction of the system according to their perceived needs, and, to an extent, over-ride the equity criterion in program design.

Recommendations

This study has indicated that there are both production and marketing opportunities for improving system performance. The marketing

¹³This is arrived at by comparing the optimum sub-system levels of production shown in Figure IX-3--27 cargas for the SFSS and 75 cargas for the LFSS--with the costs for the respective levels of output as shown in Figure IV-1. Likewise this could be arrived at by substituting the sub-system optimum production figures into the farm level cost function given in Chapter IV.

¹⁴In August 1975, when the price of potatoes rose very high, they organized a campaign to prevent the government from importing potatoes.

opportunities, it is considered, must be given equal emphasis, if not priority, if the situation of small farm agriculture is to improve. The cost structure of the marketing activities reversed the competitive production advantage of the small farmers, while the institutional arrangements for trade induced small farmers to adopt risk reduction strategies which have tended to slow SFSS growth.

Development of Marketing Skills

Knowledge regarding the functioning of the marketing system and price movements was poor among all participants, and relatively poorer among SFSS participants. Public reporting of market information should raise the level participant knowledge, while providing equal access to SFSS participants, at a minimal acquisition cost. Information would be gathered on weekly prices at the Cartago market as well as daily prices at the San Jose Wholesale Market. Other types of information would be gathered at the market places, such as: 1) approximate number of buyers and sellers; 2) number and size of transactions; and 3) conditions of potatoes reaching the markets. Estimated area planted and crop forecasts would also be regularly reported.

The availability of market information alone does not guarantee that system performance will improve. Participants must be made aware of both the availability of the information and its potential uses. The Agricultural Extension Service, or another appropriate agency should work with farmers, especially the smaller farmers, to expand their marketing skills. This would entail using market information to design a production plan which would have the farmer selling his potatoes when expected returns would be highest. Other activities would include programs or seminars with farmers to explore new alternatives for

marketing potatoes--e.g. forward contracting--as well as techniques for product improvements--e.g. field handling of potatoes.

Similar sets of activities should be undertaken with assemblers and wholesalers. Programs would be designed to expand managerial skills, such as record keeping. New alternatives for marketing potatoes--e.g. contracting, product promotion and vertical integration--would be explored. Furthermore, emphasis would be placed on developing new techniques for processing and handling potatoes.

Group Action for Small Farmers

The production level advantage of small farmers is lost due to the inability of the SFSS to generate market level economies of scale. In part, this is due to large numbers of small farmers producing and selling small lots of potatoes. Lower returns to small farmers, in part, are also due to their limited bargaining power. It is suggested therefore that small farmers be organized into a group or groups for the purpose of coordinating and negotiating the sale of potatoes.

This farmer bargaining group (FBG) would represent farmers in negotiations with assemblers. Once an agreement for the sale has been reached, the FBG would be responsible for seeing that its members abide by the conditions of the agreement, i.e. a given number of potatoes of a standard quality are to be readied for assembler pick-up on a certain day. Assemblers, for their part, would be willing to enter into regular arrangements for the purchase of potatoes, since trade with the FBG would offer the same administrative economies and security as does trade with large growers. Through increased coordination between small growers and assemblers as well as by providing assemblers with administrative economies, the FBG should be able to achieve higher and more

stable prices for its grower members. As the FBG develops, it may consider other activities to strengthen the position of small growers. It could negotiate directly with large retailers or with the National Production Council. It may consider joint ventures with potato processors. Finally, the FBG could also be expected to effectively represent the interests of small farmers before government agencies, consumers, and others.

Storage

The potato production-marketing system is characterized by large seasonal fluctuations in price resulting from a marked seasonality of production. Small farmers by generally selling potatoes during periods of peak supply, would be the ones who would most benefit from a program designed to smooth out the supply of potatoes entering the market. A program to develop a storage capacity could assure a steady supply of potatoes entering the market throughout the year. Additionally, by establishing a storage capacity within the system, the large weekly fluctuations should be greatly reduced; potatoes could be harvested and stored when the market price begins to fall due to short-run supply increases. This would reduce much of the risk of weekly price fluctuations.

Storage activities may be undertaken solely or concurrently by a government organization, a farmer's organization, or by private individuals. It appears unlikely that a government agency would undertake this activity. The National Production Council, the government organization under whose jurisdiction such a program would fall, is unwilling to undertake this type of activity due to the risks involved in handling

semi-perishable products.¹⁵ Although they do not wish to handle potatoes, it is considered that they would resist the establishment of a new governmental agency to perform essentially the same functions for which they are responsible.

Private storage may be either by farmers or by merchants. It is doubtful that merchants would openly engage in storage activities for fear of being accused of speculation. Storage at the farm level would be possible; it is most likely, however, that it would be large farmers who would initiate a storage enterprise as a part of their farm operations. Large farmers would be best able to meet the high costs and overcome, somewhat, the cash flow problems associated with beginning a storage enterprise. If small farmers did not directly participate, nevertheless, they would benefit somewhat from higher product prices as large farmers withhold potatoes from the market.

The feasibility of a farmer organization storing potatoes was examined by the National Institute for Cooperative Development (INFOCOOP).¹⁶ It was calculated that the rate of return would be 11.9 percent, or almost equal to the cost of short term capital (12 percent). This figure allows for storage of six months with an assumed loss of ten percent of the potatoes handled. The advantage of this type of program is that the acquisition cost of the potatoes are included in the operating costs. Farmers would be paid at the time they placed their potatoes in storage, which would overcome the capital problems associated with on-farm storage. Additionally, the risk would be shared by the farmers

¹⁵Statement of the director of the CNP in a meeting with Cartago potato farmers.

¹⁶Kenneth Shwedel and Victorino Elizondo, Estudio de Mercado de la Papa en Costa Rica, y Posibilidad, Utilidad y Viabilidad de la Unión Regional de Cooperativas de la Provincia de Cartago, (San Jose: INFOCOOP/AID, 1976), pp. 81-100.

as a group rather than born by the individual farmer. The major disadvantage is that non-members will also receive some of the benefits reflected in higher product prices during peak production periods as the farmer organization storage operation removes potatoes from the market. Yet non-members would not share the costs, nor assume any of the risks.

Capital Improvements

The final market-related program would be one which considers loans for capital improvements by potato merchants. The major area for investment would be in washing and drying equipment. Better washing and drying techniques would allow assemblers to handle a larger volume of potatoes. These potatoes, by being completely dried before being re-bagged, would reduce losses in the rest of the channel and contribute to a longer shelf life of the product. As indicated, there were no adequate storage facilities at either wholesale market. Assuming the market administrators would permit the building of storage facilities, this would help reduce losses from pilferage and spoilage.

Finally, capital could be made available for the development and introduction of marketing innovations. The processed potato industry is an example of an area where a large initial capital investment is necessary. By the development of the processed potato industry, demand for potatoes would become more elastic to the benefit of the entire system, but, as explained above, especially to the small farmer.

Potato Production

Potato production costs are very high. In part, this is due to the limitations on achieving least cost production levels owing to marketing inefficiencies. Yet, even without taking into consideration

the effects of marketing inefficiencies, production costs are high.

Presently, the government of Costa Rica is developing a domestic certified seed industry. Due to the high costs and poor quality of potato seeds now being used, this program is of special importance. However, it will be at least four more years until the industry can be expected to supply domestic needs (based on 1974 estimates). Until that time, seed costs will continue to be high, favoring the large farmers who both produce and sell seeds. If potato demand significantly expands, the new domestic seed industry will not be able to adequately respond with the required amount of seeds, thereby slowing down the development of other programs advocated by this section.

It is suggested, therefore, that the government of Costa Rica permit the importation of potato seeds. The level of importation would rise over the next three years so as not to provoke a sudden increase in production. As the Costa Rican seed industry begins to sell certified seeds, the quantity of imported seeds could be reduced. This program would result in immediate production cost reductions which, combined with the above mentioned marketing programs, should stimulate the potato production marketing system while improving the position of small growers.

CHAPTER X

IMPLICATIONS FOR POLICY AND ORGANIZATION OF SMALL FARM AGRICULTURE

The conclusions of this study were presented in the last chapter in the context of the Costa Rican potato production marketing system. The implications of the conclusions will be considered in this chapter within the general context of small farm agriculture and its possible role in national economic development. Alternative strategies will be recommended to change institutional arrangements identified in this study as hindering the development¹ of small farm agriculture. The possible effects on the performance of the SFSS will be discussed. Finally, areas for future research into marketing problems of small farm agriculture will be identified.

Small Farm Agriculture

The small potato farmers in this study were seen to be able to favorably compete with large farmers with respect to farm production. The actual costs and yields of the two groups are very similar. The results of this study do not differ from other production studies of small farm agriculture. Bachman and Christensen, for example, reviewing several studies on farm size efficiency indicated that small farms were often more intensely cultivated and appeared to be reasonably

¹By development it is meant increasing the welfare of this group of farmers in terms of returns to economic activities.

efficient.² Furthermore, when the average cost curves for large and small Costa Rican potato farmers were calculated, the small farmer actually was seen to be in a position to produce over a large range at lower per unit costs. This suggests that the small farm, as a production unit, can contribute to needs of a developing society.

By considering the position of the small farmer in a systems framework which includes marketing activities, it would appear that the possible contribution of small farm agriculture to national economic development, under existing conditions, is limited. The costs of marketing small farmer production is higher than for the LFSS. These costs are often reflected back to the farmer in the form of lower product prices and thus lower rates of return on investment. Higher risks in the SFSS--in part, contributing to the higher costs--have induced small farmers to follow strategies which emphasize risk reduction.

The conclusions of this study indicate that for the SFSS marketing activities are an important constraint hindering growth of small farm agriculture. Before marketing costs were considered, small farmers were seen to have the ability to produce potatoes at lower costs. Yet by the inclusion of marketing costs to determine the sub-system optimum level of production, the farm level output required to achieve the sub-system optimum resulted in total small farmer production costs being approximately equal to total large grower production costs. Furthermore, if other SFSS are similar to Costa Rican potato SFSS, which was said to be near equilibrium, there would be little incentive

²Kenneth L. Bachman and Raymon P. Christensen, "La Economia del Tamano de las Granjas," in Desarrollo Agrícola y Crecimiento Económico, ed. H. M. Southworth and B. F. Johnson (Mexico: Union Tipografica Editorial Hispano Americana, 1970), pp. 264-75.

to increase production. By expanding output diseconomies of scale would occur, probably, lowering the returns to small farm agriculture. Generalizing from this study, it would appear to indicate that if small farm agriculture were to successfully play a role in national economic development market-oriented programs should be given serious consideration.

In the last chapter, it was seen that market-oriented programs could be designed which simultaneously improve both system performance and the position of small farm agriculture. Likewise, if other SFSS's are similar to the Costa Rican potato case, where the performance of sub-sector marketing activities restricts farm output, then market-oriented programs could increase the size of agricultural surplus available to finance growth in the rest of the economy, while, nevertheless, improving the return to agriculture. Programs such as these would have the effect of incorporating small farm agriculture as an integral part of the national product-marketing system.

Policy Implications: Market Programs for Small Farm Agriculture

The argument presented in this study should not be interpreted as one of advocating market reforms as the solution to the problems of small farm agriculture. It is recognized that for any particular case other variables--e.g., land tenure, capital requirements, etc.--may pose more immediate and overwhelming constraints. What is argued, however, is that even if these constraints were removed, development of small farm agriculture would not necessarily follow due to limitations on growth arising from the marketing sector. Marketing programs should, therefore, be considered as part of an overall development program for small farm agriculture.

Before formulating specific policies, it is, of course, necessary for government to understand the workings of the particular production-distribution system as it applies to small farm agriculture. Nevertheless, within the framework of the hypotheses put forth in this study, general policy areas and programs are identified below. They are directed at bringing about changes in the institutional arrangements for trade which would permit and encourage small farm agriculture to adopt new standard operating procedures consistent with a dynamic and vigorous production-marketing system. The program areas identified include: 1) technical assistance, 2) market information, 3) financing infrastructural and capital improvements, and 4) group action.

Technical Assistance

Programs of technical assistance, something akin to on-going extension programs, should be developed to work with small farmers and merchants so as to promote better marketing practices and greater coordination. The study of the Costa Rican potato production-marketing system identified the relationship between farmers and merchants as a key variable in explaining sub-system performance. Among the first activities of this type of program, therefore, would be to undertake a diagnostic study of the particular production marketing system in question giving special emphasis to the institutional arrangements for trade that exist between growers and merchants. Conditions which impede greater coordination between small farmers and the rest of the system would be identified. This information would then be used to determine specific activities to undertake.

Educational efforts to make small farmers aware of system workings is a possible activity to be incorporated into a technical assistance program. In this study, it was seen that small farmers were often mistaken in their conception of the structure and conduct of the potato marketing system. It is considered that as long as small farmers' perception of the system in which they operate is incorrect and their knowledge of alternatives is limited, it is unreasonable to expect their decisions to result in improved performance. Activities could be designed to acquaint small farmers with different concepts and organizational forms of marketing within the context of the system in which they operate.

Other activities in the area of technical assistance would be to help establish institutional rules for trade. This may include, for example, working with farmers and merchants to create a formal set of product grades which would be understood and recognized by all participants. Another activity may be to help develop simple contracts between participants for the supply of agricultural products.

Technical assistance programs should also work with merchants to attempt to improve administrative abilities and identify new marketing opportunities and techniques. With respect to the Costa Rican case, for example, it would be possible to work with assemblers to help them make better use of fixed capacity--such as renting out space for washing carrots or beets. Additionally, studies could be initiated to determine the feasibility of alternative techniques for handling products to reduce losses and extend their life in the distribution channel.

Efforts should also be made to establish programs with government officials to develop: 1) their awareness of the workings of the marketing system; and 2) their abilities to formulate viable alternatives

to market related problems. At the upper levels of government, efforts would concentrate on developing systematic policy towards food marketing. At the lower levels of government, emphasis could be placed on: 1) improving the technical aspects of gathering adequate market statistics; and 2) developing technical marketing skills so as to be able to work with farmers and merchants in resolving market related problems.

Market Information

Throughout this study, it was seen that the SFSS participants were less knowledgeable than the LFSS participants of the market system in which they operated. Whereas the large farmer, for example, invested in gathering market information through regular attendance at the Car-tago marketplace, the small farmer's knowledge of the market was largely restricted to the period in which he was selling products on the market. Information, additionally, was exchanged among members of the LFSS. The costs of gathering information therefore presents a barrier to small farm agriculture. Additionally, it is suggested that the decision as to which information to gather, i.e., that which would pay the highest return, presents a problem not only to the SFSS but also to the LFSS. Programs designed to gather and disseminate market information to aid in the decision-making process of system participants should facilitate improved market coordination.

The types of information that the farmer may best use to his advantage in terms of higher prices are those that aid in effective decision-making covering areas from price negotiations to long-term planning. They would include: 1) spot prices at regional markets; 2) daily movements in quantities; 3) estimates of quantities entering the market; and 4) historical data. The first three types of information

are not necessarily new to market reporting, however, the fourth category merits further discussion. By historical data, it is meant information on long-term trends and movements within the system. This would imply presenting more than "raw" data. As the information is gathered it could be analyzed and presented in an outlook type format. An example of this would be to give the day's price and relate it to seasonal production trends as well as to the monthly and yearly price movements.

Information programs should also be directed toward merchants and consumers. For example, something similar to the USDA's Plentiful Food Program could be established whereby during periods of large supply consumer demand could be stimulated with spot announcements suggesting "weekly deals," encouraging the consumption of different products throughout the year, i.e., shift the demand curve. Technical assistance programs for merchants could be combined with information programs. For example, introduction of new merchandising techniques could promote the sale of certain products as loss leaders during periods of peak production.

Information must be presented in a form usable by the client. It is further suggested, therefore, that part of any information program would have to include training programs directed at the SFSS explaining what is being disseminated and how that would be incorporated into the planning process. For example, reporting a price at the market would require that the farmer realize: 1) that this may be an average price and not a guaranteed government price; 2) that an average price is not necessarily the one he would receive; and 3) that the spread between the market price and the farm gate includes the costs of transportation

and handling. Finally, by placing this price in a yearly perspective relating it to movements of volume and production, decisions may be taken which reflect more accurate information. It is important that this be directed at the SFSS; the participants within the LFSS, as demonstrated in this study, already know how to incorporate this information into the decision-making calculus.

Financing Infrastructural and Capital Improvements

The effects of the cost structure of marketing activities on total system costs and performance in general, and on the SFSS costs and performance in particular, as shown in the Costa Rican case study, indicate the need for programs to improve the efficiency of the marketing sector. By reducing the costs of marketing, small farm agriculture could become competitive with large farm agriculture. Often, however, a particular improvement will require a large capital investment beyond the means of the small or medium size trader in the system. Where commercial credit has operated, generally it has been channeled into the development of processing industries. If commercial credit institutions have been reluctant to finance capital projects where there is some collateral in the form of real estate and/or machinery, financing operating capital is unheard of, except for occasional post-harvest loans to farmers under financial duress.

With respect to potato marketing there are numerous examples where capital investments would improve the technical performance of the merchants. The obvious, and often commented on, example would be to acquire better washing and drying facilities. Another area might be to finance new packaging techniques. The establishment of storage facilities is another important area where capital is lacking to make the

needed investments; in this case it need not be channeled only to the middleman, but also to the grower. The lack of operating capital may prove to be a major constraint to the development of an efficient assembly or wholesale operation.

While the specifics may vary from country to country and from region to region, one of the important infrastructural projects that should be considered is the possible construction of wholesale markets and regional assembly centers. Silva, for example, indicates that in Bogota Colombia the new wholesale market brought about: 1) channel simplification; 2) improved vertical coordination; and 3) routinization of activities and additional specialization.³ The physical design and management of central wholesale markets should be used to stimulate desired system performance. Examples of possible changes to stimulate improved performance are: 1) regressive rents, i.e. proportionally lower rents for larger operations; 2) centralized storage facilities; and 3) stall designs to permit wholesale flexibility. Marketplaces would of course have to meet minimum requirements regarding size, traffic control and protection from rain, wind and sun damage. Central wholesale markets are not necessarily the place for farmer trade and, therefore, this should not be encouraged in the design of the market nor its operational rules. The farmers who trade at the San Jose Central Wholesale market--not considering assemblers who also farm--are there mainly seeking employment opportunities. They are able to compete by successfully exploiting their own labor. It is considered that the social costs of designing markets to encourage physical access of the small

³Alvaro Silva, "Evaluation of Food Marketing Reform: CORABASTOS--Bogota" (Ph.D. dissertation, Michigan State University, 1976), pp. 108-115.

farmer are less than the benefits from temporary employment for small farmers as assemblers, since this would tend to discourage desired wholesale behavior.⁴

Rural assembly markets, possibly even of the nature of the Cartago market, might result in higher prices to the producer. They would, however, have the effect of stimulating better coordination within the system by bringing together buyers and sellers. The specific institutional arrangements would determine the type of performance, and would depend on the specific situation.

It is recognized that improved physical facilities can improve system performance, yet the benefits of the improved system performance may not accrue equally to all participants. Silva points out that traditional farmers and merchants may have obtained fewer benefits from the construction of the new Bogota wholesale market.⁵ It is recommended, therefore, that programs related to the construction of market facilities include other projects, such as those discussed in this chapter, to aid SFSS participants in adopting new organization and operational procedures to best take advantage of the new marketing facility.

Group Action

The above recommendations represent policy areas which should provide the institutional and infrastructural setting for improved system performance. Nevertheless, in many cases the lack of organization among small farmers limits their ability to take advantage of these

⁴Specific employment generating projects could be initiated in rural areas to occupy this labor. This would directly address the employment question, and projects could be designed to build needed rural infrastructure.

⁵Silva, p. 5.

programs. The last part of this section shall deal with alternative organizational structures for small farm agriculture, which could capture the benefits from government programs and stimulate the development of the SFSS.

Cooperatives

In the development context cooperatives have special appeal. They are a tested organizational form for bringing together large numbers of farmers to be able to better coordinate activities and services. They are also seen as means of peacefully shifting economic power away from traditional elite through Pareto optimum redistribution. The social focus of cooperatives are considered desirable for improving the quality of life for their members. They can "provide an organization through which farmers learn over a period of time to work together for their common benefit and to educate themselves in the commercial aspects of a developing community."⁶ Finally, the democratic form of its organization is inherently attractive to policy-makers and international lending agencies especially when contrasted with forms of mass organization based on more autocratic and/or administrative social-economic system.

The same ideology which gave rise to the cooperative and accounts for its unique organizational format also in many instances, predisposes it to failure as an institution for the marketing needs of small farmers.

Firstly, it is suggested that often the perceived need for marketing cooperatives is based upon misconceptions of the marketing

⁶Edith H. Whetham, Agricultural Marketing in Africa (London: Oxford University Press, 1972), p. 96

system.⁷ This has led to cooperative programs that do not address themselves to the real problems facing small farm agriculture. In Costa Rica, for example, a potato marketing cooperative was formed based on the conception that middlemen were earning unnecessarily large profits. It was believed that the cooperative could easily capture this "large" profit and divide it among its members. This study has shown that low product prices are, in part, related to high marketing costs and not "unnecessarily large" profits by assemblers. The potato cooperative developed a marketing program which duplicated the activities and, consequently, the inefficiencies of existing assembler operations. The additional costs, essentially from having to rely on hired labor, forced the cooperative to cease marketing potatoes in less than one year. It is considered that in many other cases cooperative marketing programs are based on misconceptions and faulty information and result in the duplication of the existing inefficient marketing operations carried out by the private sector.

The fact that cooperatives are more than purely economic units creates additional costs. The social and educational activities undertaken by cooperatives gives them their unique character. Society accepts and encourages cooperatives to undertake these activities, but society will not finance them. Cooperatives, therefore, are often compelled to fund these activities through the returns on their marketing operations. This may hinder the cooperatives' ability to compete with middlemen. If the members do not perceive these other activities

⁷ Henry Larzelere, "Cooperatives in Agricultural Marketing," in Agricultural Marketing Analysis, ed. Vernon L. Sorenson (East Lansing: Michigan State University, M.S.U. Business Studies, 1964), p. 208.

as a return to them from cooperative trade, they will be tempted to deal with private middlemen.

A third area which works against the effective use of cooperatives as a marketing organization is the decision-making framework. For the cooperative to obtain some sort of market power, members must relinquish some of their own prerogatives. In this manner the cooperatives can begin to bring benefits to its members through coordination and bargaining strength. Yet, membership and participation is voluntary. In Costa Rica, for example, there was great reluctance to permit the cooperative to acquire any coercive power over its members through such features as contracts with members for the supply of the raw product. This inhibits planning since the cooperative is never sure of delivery by its own members. Furthermore, cooperatives often promise to accept everything a member offers for sale. Thus, the cooperative will face periods of chronic over and under supply of the products it markets.

Cooperatives due to their particular nature are saddled with limitations and costs not experienced by middlemen. If a cooperative is going to be successful, therefore, it cannot compete by being just one more middleman. "The successful cooperatives have been those that served as pace setters in their particular industry."⁸

Among the first steps towards developing a strong cooperative sector is the realization that their welfare is connected to the performance of the system in which they operate. This would involve cooperative leaders being in the forefront pushing for changes in the system such as those discussed in this section. They would operate somewhat like large farmers in the Costa Rican potato production-

⁸Larzelere, p. 211.

marketing system by attempting to influence the direction of policy in their favor.

Cooperatives should reexamine their role in the marketing of agricultural products. Instead of actually handling the products, cooperatives may act as agents or brokers for member farmers. These types of arrangements could benefit member farmers through higher product prices since cooperatives: 1) would be in a position to provide administrative efficiencies to merchants; and 2) would exercise greater bargaining power than that of any individual member.

Whether the cooperative handles the product or acts as a broker, it must consider entering into arrangements which would increase vertical coordination. This will require developing outlets for their members' production, as well as being able to guarantee the participation of their members in such arrangements. It is considered that cooperatives will have to actively look for clients. Most of the established trade is probably already in the hands of the larger farmers or middlemen. Thus, cooperatives should give consideration to merchandising techniques to differentiate their product or offer special services. Once this is achieved they could begin to exercise supply control which may add stability to the market and increase the returns to their members.

The final area that should be considered in developing alternative cooperative programs is the investment in marketing education. This should be for both cooperative managers and members. It was shown that small farmers had poor knowledge and understanding of the system. It is considered that many cooperative officials' knowledge and understanding of the marketing system is not much better than that of the grower-members. By developing programs of marketing education, it would

be expected that managers would learn by teaching, and members would acquire a better understanding of the system in which they operate. This would result in better decisions by managers and greater cooperation by members.

Other Group Action Alternatives

It is suggested here that in many settings other forms of group actions may be more appropriate and effective than a cooperative in stimulating the development of small farm agriculture. The reason for this lies in the limitations imposed on cooperative action and flexibility, listed above, in addressing themselves to specific problems or needs of small farm agriculture. The existence of noncooperative group action, however, need not preclude cooperatives.

Private association. Private associations are considered to exist when two or more participants within the production marketing system agree to share or finance an activity perceived to be to the mutual advantage of those involved. The formation, either through incorporation under existing laws or through other types of institutional arrangements, requires the mutual consent of all involved. These associations may be formed for any number of reasons, such as: 1) buying and/or selling, 2) acquiring needed production or distribution facilities or machinery, 3) promoting the consumption of a given product, etc. The goals of such organizations may be explicitly pecuniary, and they need not specifically relate to social or national objectives.

The advantage of private associations for the development of small farm agriculture is, as mentioned above, the flexibility offered for organizing around specific tasks and goals. In this study, however, it was seen that SFSS participants were more distrustful and less aware

of opportunities within the system than were LFSS participants. Outside stimulation, possible through the technical assistance program discussed above, would be necessary to encourage the formation of these groups. Counter productive system performance, however, may also result from the formation of private associations. For example, a farmer association from one area could engage in unfair activities to promote their position at the expense of farmers in other areas. Finally, as with cooperatives, private organizations must deal with the "free rider" problem. When returns do not occur only to members, there will be little incentive to support the organization.

Marketing boards. The organization of small farm agriculture may be achieved through marketing orders or boards. The possible activities of marketing boards are varied, running from that of only promoting the consumption of a given product all the way to physically purchasing and distributing a group of products. Differences in the institutional organization of marketing boards address themselves to many of the problems present in cooperatives and private associations.

Marketing boards are given legal jurisdiction over some or all aspects of the distribution of a product or group of related products. The make-up of the organization will depend upon the particular set of activities for which it is charged; however, once defined, all participants in the system whose activities fall under the mandate of the board may be considered as members, thereby eliminating free-rider problems. Financing of the boards is often through a tax, surcharge, or commission on the products marketed. A final difference is that the goals are ascribed to the marketing board by the legal authority which created that board. In this manner, it would be expected that the objectives

to which the board addresses itself are supportive of the broader national goals.

Assuming that marketing boards do not physically handle the products under its jurisdiction, they could systematize exchange through contractual relationships. Model contracts, conventions for grades and standards, as well as procedures for claims would be established by the board. At this point, small farmers may be organized into cooperatives or private groups for bargaining purposes. The board could be designed in such a way that preference would be given to cooperatives or small farm associations, thereby stimulating the formation of these organizations. In this manner: 1) small farmers would be provided a neutral institutional framework in which to trade; 2) organizations of small farmers would be encouraged; which in turn would allow; 3) small farmers, through their organization, to increase their returns from expanded services to their buyers and more efficient bargaining.

Marketing boards may also: 1) undertake activities designed to expand the demand for their products; 2) attempt to regulate the supply entering the market; 3) guarantee loans for capital and operating expenses; 4) undertake research designed to increase the knowledge of the system and determine processes and technologies to improve its performance; and 5) regulate the numbers and/or operating conditions (e.g., types of packaging) of participants at different levels of the system. By these sets of activities, the marketing board could bring about a reorganization of the distribution system onto a lower cost curve.

The make-up of the governing body of the Marketing Board should have representatives of the merchant middlemen as well as government

and farmers. By the inclusion of representatives of the middlemen, this group would not be alienated from the process and more likely would accept many of the changes proposed since they would be a part of the process. Representatives of the state would guarantee that the marketing board's activities are consistent with national goals. Farmer representation may be defined so as to favor small farmers and/or encourage further group activity. In a proposed marketing board law for Costa Rican vegetable marketing, farmers are only represented through cooperatives.⁹ This guarantees the small farmers, who are members of the cooperatives: 1) participation in the decision-making process, 2) access to policy makers, 3) the ability to influence the activities of the board, and 4) first preference to the distribution of the property rights emanating from board programs.

There are, however, a number of areas of concern when considering marketing boards as a possible mechanism for stimulating agricultural development. First, there is the question of individual freedom versus all-inclusive group action. The trade-offs between loss of individual freedoms and gains from group action must be weighed.¹⁰ Another area is the danger of creating a quagmire of bureaucratic institutions each responsible for different agricultural products. Shaffer offers a solution for this by proposing a federation of marketing boards "as a means of achieving economies of scale in providing some of the important

⁹ Asamblea Legislativa, Departamento de Servicios Tecnicos, "Junta de Proteccion y Relacion de Horticultor y el Consumidor," San Jose, 1976. (Mimeographed draft.)

¹⁰ In Michigan, a bargaining association is accredited if "more than 50% of the producers in the bargaining unit who produce more than 50% of the volume of the affected commodity assent to representation by the association." Michigan Legislature, Agriculture Marketing and Bargaining Act, Act No. 344, Public Acts of 1972, p. 7.

services to the [marketing boards]"¹¹ and "a government agency . . . established with development and supervisory responsibility for all [marketing boards]."¹²

There are problems regarding the specification and institutionalization of marketing boards. Determination of the activities and identification of the participants requires great care. Difficulties may also arise in gaining acceptance for the board. Once it is operating, there exists the possibility that a small group may control the board policies. Finally, marketing boards will also face problems similar to those of cooperatives and other groups in acquiring the administrative capacity and manpower needed to carry on their programs.

It is considered that marketing boards, nevertheless, represent a viable alternative institutional marketing system. They should be viewed, therefore, as a means of eliminating some of the limitations on the development of small farm agriculture found in the existing institutional frameworks for SFSS trade.

Suggested Research

This investigation has used a case study approach to identify marketing problems of small farm agriculture. Recommendations were made with respect to the specific circumstances of the Costa Rican potato production marketing system. Where possible, in this chapter, attempts were made to apply the results to small farm agriculture in general. It is recognized and recommended that to be able to truly

¹¹James Shaffer, On the Concept of Agricultural Commodity Development Boards as Institutions for Fomenting Economic Development (East Lansing: Department of Agricultural Economics, n.d.), p. 10.

¹²Ibid., p. 5.

develop useful principles, additional case studies should be undertaken to look at marketing problems of small agriculture in other areas and for other crops under different institutional arrangements. This final section will attempt to identify specific areas where additional studies would best be able to build upon this research in order to: 1) further advance the understanding of the linkages between marketing and small farmer welfare; and 2) indicate alternative program areas for improving the performance of agricultural production marketing systems with particular concern for small farmers.

Organizational arrangement for trade. Research should be undertaken to identify alternative arrangements for organizing and coordinating small farmer trade. Many government programs only focus around the organization of small farmers into formal cooperative groups, yet other organizational formats may prove to be better suited to small farmer needs. Alternative organizations should be evaluated as to: 1) their ability to increase the bargaining power of small farmers; and 2) the extent to which they are able to reduce the costs of marketing and pass these savings along to small farmers. Additionally, the relationship of small farmer groups to different arrangements for improved vertical coordination should be examined. Consideration would be given to ways in which the different coordinating arrangements would: 1) reduce risks; 2) provide timely information; 3) improve planning; and 4) permit economies of scale of small farmer production to be reached.

Group farming. Institutional arrangements exist in many countries, such as Venezuela, Peru, Israel, etc. whereby land is farmed by growers working as a group in order to achieve certain production level efficiencies. It is suggested, therefore, that research also be

undertaken to evaluate the performance of different organizational forms of group farming as it relates to the ability to overcome marketing problems of small farmers. Among the areas of concern would be the ability of the different group farming schemes to: 1) incorporate small farmers into the national and international market; 2) achieve higher product prices; 3) improve vertical coordination; and 4) balance losses of individual freedom with gains from group farming.

Marketing policy. Additional research is needed to aid policy makers in designing systematic policy towards food marketing with respect to small farm agriculture. Attempts should be made to identify the linkages between wholesale and retail operations and small farm agriculture. The role of government intervention in the purchasing and distribution of agricultural products would be evaluated as to the costs and distribution of benefits. Additionally, research should identify areas where government intervention would improve vertical coordination and facilitate exchange, e.g. systems of weights and standards, public reporting of market information, and development of model contracts.

Costs and operating procedures of middlemen. The cost structure associated with marketing activities in both sub-systems of the potato production-marketing system was seen to severely limit the development of small farm agriculture. It is recommended, therefore, that further marketing costs studies be undertaken with special attention to their effect on farm production. Marketing costs studies, furthermore, should compare costs of both the LFSS and SFSS. Where costs diverge, this would give an indication of possible program areas to improve the efficiency of those traders serving small farms.

Related to the costs of marketing are the standard operating procedures used by the middlemen in each sub-system. It was seen in this study that the middlemen of the LFSS relied on informal arrangements to guarantee a steady supply of potatoes. Further study should be carried on in this area. It is suggested that differences in standard operating procedures are a major source of cost variance between the two sub-sectors. These differences and their possible source should be identified so that alternative standard operating procedures may be recommended. The conclusions of this research could then be incorporated into programs of technical assistance for merchant middlemen.

Access to information and decision-makers. The question of access to decision-makers has generally been the domain of political scientists and others who have studied peasant organizations. As far as this author is aware, these studies have focused on the role of organizations within the framework of national political power structures and not on their impact on the distribution of agricultural and marketing information and opportunities. In Costa Rica, the large farmer's involvement in the development of the potato seed industry is an example of how access to the decision-making process influences the distribution of new property rights generated from government sponsored programs. Research should focus on identifying local leaders, change agents, and government officials responsible for program implementation. Communication networks between these individuals and farmers would be determined so that the level of contact with small farmers could be increased.

APPENDICES

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Sources: Farm, assembly and wholesale level surveys for this study; Jose Jimenez, "Analisis del Mercadeo de Acopio de Papa de la Provincia de Cartago, Costa Rica" (Ing. Ag. Thesis, Universidad de Costa Rica, 1976).

APPENDIX B
THE ACQUISITION OF POTATOES FOR INDUSTRIAL PROCESSING

Processors acquire potatoes by means of: 1) purchasing them directly from farmers; 2) buying directly from assemblers at wash-houses; 3) going to one of the San Jose wholesale markets to buy potatoes; and 4) utilizing a fixed arrangement with assemblers to supply them with potatoes. The most important form is through a fixed relationship with an assembler. This accounts for 60 percent of purchased potatoes for industrial processing. It should be noted that those processors who have entered into relationships are the largest potato chip manufacturers and two of the three nonpotato chip processors. The arrangements between these processors and the assemblers provide the processors a steady supply of potatoes throughout the year. This is of special importance since there is no storage of fresh potatoes in the system, and potato processors tend to operate with very low levels of inventory.

Among the other arrangements for acquiring potatoes for processing, only some potato chip processors located in Cartago purchase directly at assembler wash-houses (19 percent) or from farmers (4.5 percent). The remaining 17 percent are purchased in the San Jose wholesale markets by smaller chip manufacturers and one nonchip processor.

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