

MARKETING AS A FIRST GENERATION PROBLEM OF SMALL
FARMERS: A COSTA RICAN CASE

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OECD/FAO INTERNATIONAL SEMINAR

On

Critical Issues on Food Marketing Systems
in Developing Countries

October 18-22, 1976

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The world food crisis of 1973 has helped to focus attention on what has been a long term imbalance between the rapidly rising demand for food and the not so rapidly rising supplies, especially in developing nations. In the course of the World Food Conference, the flurry of lesser conferences and the subsequent rhetoric^{1/} there has been general agreement that agricultural development must be given top priority and that huge investments must be made in order to avoid global catastrophe. "This entails a new determination to mobilize the small farm sector - the farm families working on eight acres and less, the labourers and landless men. A multiple effort is required".^{2/}

But development literature has not yet adequately dealt with the issue of efficient organization and coordination of the markets serving small farm agriculture. Development planners are preoccupied with macro economic issues such as agricultural credit allocations, agricultural research, national agricultural price policy and education and have largely overlooked the issues of market coordination which determine how effective those macro economic policies will be in achieving their lofty development goals.

Moreover, marketing has been regarded as a "second generation" problem by development researchers, planners, policy makers and even

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^{1/} Barbara Ward describes the activity vividly: "The whole world seems to be full of moving delegates, declarations, speeches, disclaimers, corridors of rumour, endless shifts behind the scenes...Like an anthill that has received a violent kick, the great termitery of Planet Earth is all movement and confusion", in Hunger, Politics and Markets, The Real Issues in the Food Crisis, Ed. Sartaj Aziz, New York University Press, New York, 1975, pp. 3-4.

^{2/} Ibid. pp. 2-8

by farmers themselves.^{3/} This implies that the "first generation" problem is to increase physical output. Yet, how many times have peasant farmers related their frustrations of having obediently adopted recommended technologies, thereby increasing production, only to encounter depressed market prices which might not even cover harvesting costs?

We maintain that marketing is not a second generation problem. It is as much a "first generation" problem as plant breeding, seed multiplication or production credit. And we believe it is important for development researchers, planners, aid agencies and farmers to recognize that and act accordingly.

To support that assertion we will draw on the empirical results of a recent study of potato producers in Costa Rica. In that study we hypothesized that small farmers are at a competitive disadvantage because their products are marketed through sub channels composed of small scale, limited resource intermediaries who exert little effort to reduce costs and risks through "active market coordination". We further hypothesized that this, coupled with the existence of economies of scale in marketing activities, creates a situation in which the unit cost of small farmer products delivered to the consumers are relatively high. Given the limited purchasing power of consumers in LDC's, total consumption is limited by the high delivered price of small farmer products. If there exists a commercial or large farm component, their products will probably be marketed through a more effectively coordinated sub-channel using larger scale marketing agents and thereby achieving marketing economies of scale and "active coordination" economies. Hence, the demise of small farmer agriculture, in spite of evidence that small farmers can be as efficient in production as large farmers.

The situation is compounded by the tendency of policy makers to over simplify in diagnosing marketing problems. One of two extreme views will normally prevail. They can be summarized as follows: (1) the market is functioning "efficiently" because there are many buyers and sellers and there are no drastic price imperfections in

^{3/} As the "green revolution" reached its peak there was much discussion in the literature about second generation problems such as storage, transportation and marketing. See for example; Walter P. Falcon, "The Green Revolution: Generations of Problems," American Journal of Agricultural Economics, 52:698-710, December, 1970.

space and time,^{4/} or (2) market intermediaries are monopolistic parasites who fatten themselves by exploiting farmers and consumers through artificially contrived periods of market glut and scarcity.^{5/} The correlative policy prescriptions are: (1) ignore the marketing system to concentrate on production problems or (2) devise elaborate projects to eliminate middlemen by creating government marketing corporations, boards or cooperatives. But experience, at least in Latin America, suggests that neither of these general policy positions are likely to foster the development of healthy and efficient marketing systems.^{6/} The Costa Rican potato case further corroborates that conclusion.

In the remainder of this paper we will explore that Costa Rican case, attempting to identify and describe the marketing arrangements and related management practices which have improved overall market coordination and performance while leaving small farmers at a competitive disadvantage.

The Costa Rican Potato Sub-System

The information for this case was drawn from of a year long potato production and marketing study in the region which produces and markets over 90% of the potatoes consumed in Costa Rica.^{7/} The research methodology was derived from that used in several other countries by the Latin American Marketing Planning (LAMP) Center at Michigan State

^{4/} The following statement from a paper by John Mellor summarizes this position:..."the private trade in general operates quite competitively and at a relatively high degree of economic efficiency even though resource productivity may be relatively low." Performance of Private Trade and Cooperatives, Occasional Paper No. 87 Technological Change in Agriculture Project, Department of Agricultural Economics, Cornell University, December, 1975, p. 3.

^{5/} It is difficult to find a trained economist who would publish such a position in a professional article, but such arguments by public officials and private citizens (some of whom are "well trained economists") are regularly quoted in LDC newspapers and other popular literature.

^{6/} For a summary of conclusions from marketing research in five Latin American countries. See Kelly Harrison, et.al., Improving Food Marketing Systems in Developing Countries: Experiences from Latin America. Research Report No. 6, Latin American Studies Center, Michigan State University, 1974.

^{7/} The complete study will be reported in a forthcoming Ph.D. Thesis at Michigan State University by Kenneth Shwedel.

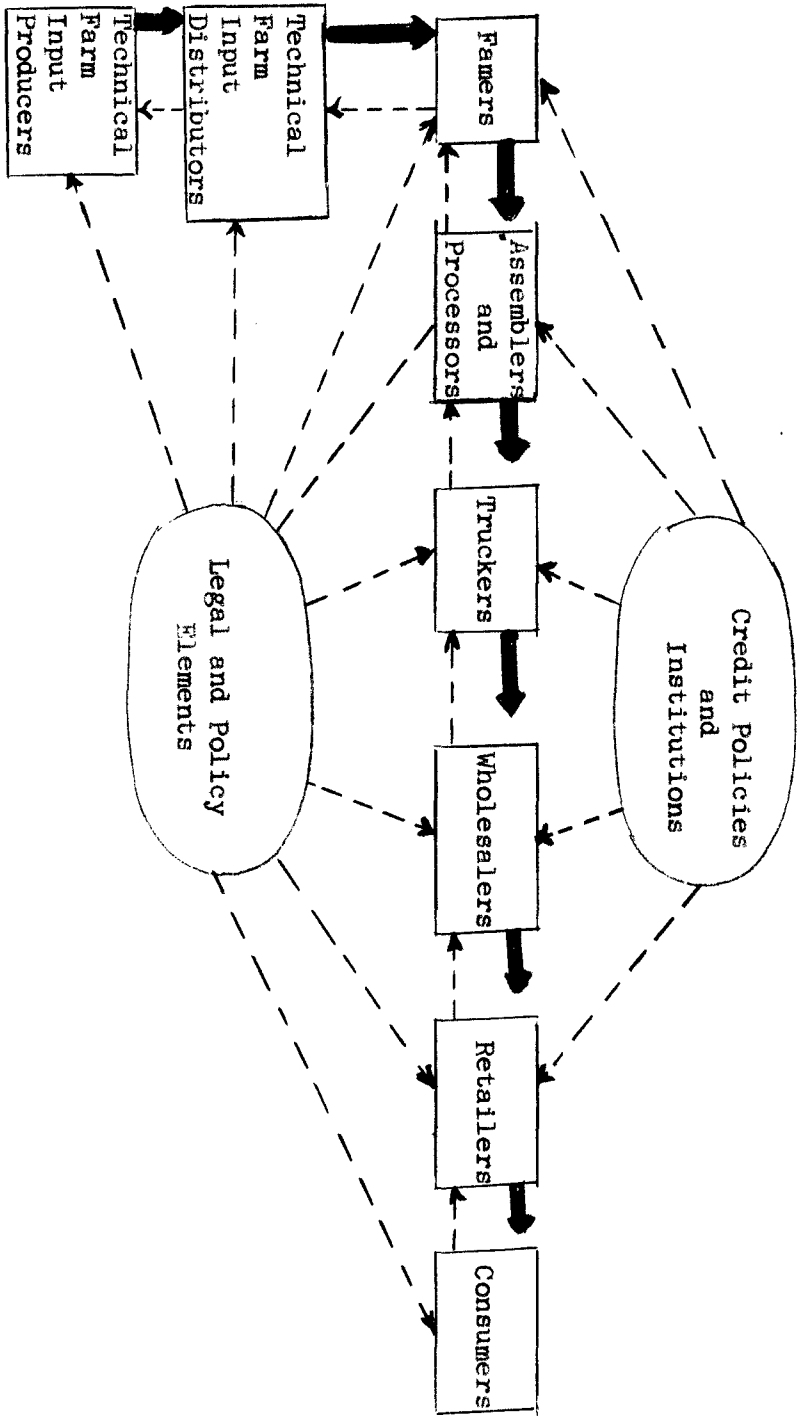


FIGURE 1. Principal Components and Relationships in Food Production-Marketing Systems.

system as measured against established goals. It, therefore, encompasses pricing efficiency and efficiency of resource use (which are the standard concerns of classical economic analysis) as well as market stability, income distribution effects, employment effects, nutritional effects, or any other important goals which society may establish for the food production - marketing system.

The Setting

Costa Rica is one of the smaller countries in Central America. It has a population of about 2 million with over 50 per cent living in urban areas. The capital city, San José and its suburbs, contain about 38% of the country's population. But in spite of the high degree of urbanization, 46 per cent of the economically active population is employed in agriculture. And another 15% is employed in businesses directly related to agriculture (agribusinesses). Most Costa Rican farmers are relatively specialized in the production of those few products which are well adapted to their specific micro-climatic conditions. Similarly most production is sold in the market, and a high percentage of total production flows through San José.^{10/} Thus Costa Rica is not highly representative of the poorer developing countries. This must be born in mind when interpreting the results of this research.

Demand Factors

Potatoes are not a staple in the Costa Rican diet. Per capita consumption is only 27 pounds, which is quite low in comparison to potato eating countries like Peru (230 lbs), Colombia (123 lbs) and the United States (118 lbs). While potato prices in Costa Rica are relatively high (U.S. \$12.50 per hundred weight)^{11/}, the low per capita consumption is partially attributable to the fact that potatoes are not an indigenous crop. While some potatoes were cultivated as early as 1910, it was not until 1935 that they were produced on a large scale. The high caloric staple foods in the Costa Rican diet are rice, cassava, plantains and beans.

Potatoes are primarily an urban food. Nearly 75% of the production is consumed in urban areas. The reasons for this phenomenon appear to

^{10/} Kelly Harrison, James D. Shaffer and Michael Weber, Fomenting Improvements in Food Marketing in Costa Rica, Research Report No. 10, Latin American Studies Center, Michigan State University, East Lansing, Michigan, 1973.

^{11/} The standard measure for potatoes used in this case is the hundred-weight (cwt.) - one hundred pounds.

be: (1) rural marketing costs are high as are potato prices; (2) the demand for potatoes is relatively income elastic; (3) upper income families are concentrated in urban areas and especially in the capital city, and (4) virtually all potatoes are brought to the San José market for distribution.

Given the relatively high rate of urban population growth and rising incomes, the total demand for potatoes should be rising substantially. Nevertheless, potato production has not responded to the apparently rising demand. Per capita consumption has remained constant at 27-28 lbs. since 1967. The apparent reason is that during that time production and marketing costs and potato prices have increased at a faster rate than the overall consumer price index.

Evidence suggests that demand for potatoes in urban areas, especially the capital city, is highly price inelastic. On the other hand the demand for potatoes in rural areas is more elastic. This suggests a kinked demand curve. (Figure 2). Upper income urban consumers eat potatoes year round without great concern for price variations. In figure 2 we depict their more or less fixed demand at X_1 . Middle and lower income urban consumers and upper income rural consumers purchase more potatoes during the periods of abundant supply

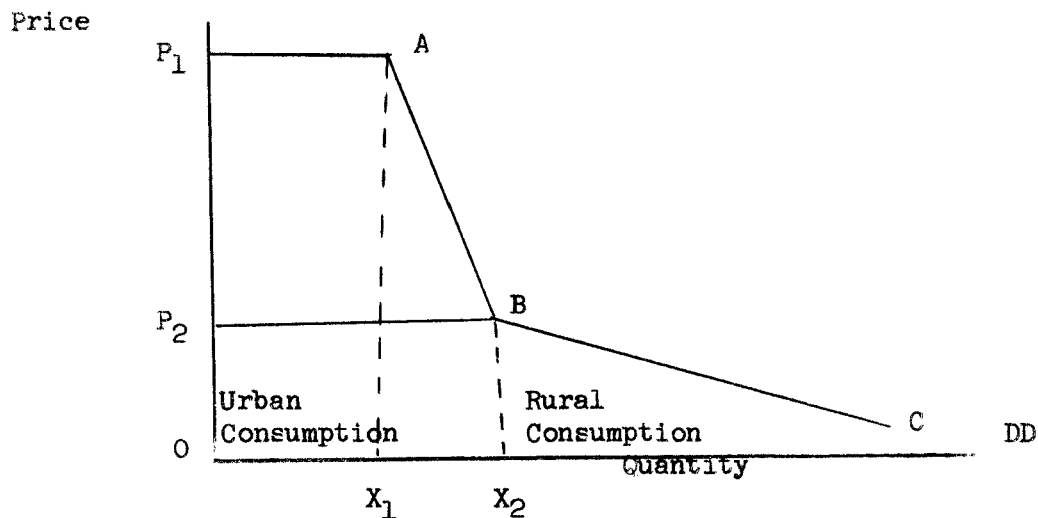


Figure 2 Apparent Demand Curve for Potatoes
in Costa Rica.

and declining prices (between X_1 and X_2). And the mass of rural consumers only consider potatoes when prices fall below P_2 . Below that price level demand is relatively elastic.

As we will see, this demand situation is simultaneously a result of existing organization and coordination arrangements in the marketing system and a cause for certain coordination changes which are in progress.

Production and Marketing Factors

Most of the potatoes for Costa Rica are produced on the rich soils of the Irazu Volcano which is located about 35 kilometers southeast of San José. About one third of the national production comes from farms of less than 10 hectares with less than 2 hectares planted to potatoes. The remaining two - thirds are produced on farms of more than 10 hectares with more than 2 hectares planted to potatoes.

A distinctive marketing process has evolved over time. Every Sunday morning between 9 and 11 a.m. farmers who have potatoes ready to harvest go to a certain street corner near the market plaza in Cartago, the principal city in the production zone.^{12/} They may take a small sample of 10-15 representative potatoes from their field. There they meet with assembler - buyers to negotiate sales for delivery during the coming week. The farmer and assembler negotiate a base price, quantity and date for pick up at the farm. No money changes hands at the time of negotiation or even at the time of pick up. The farmer is paid for his potatoes the following Sunday morning. The final price received by the farmer will depend on the quality of potatoes actually delivered, the wholesale price received by the assembler and the assembler's decision as to how much he can reduce the agreed on price without evoking some kind of future retaliation by the farmer. Small farmer prices are reduced more than large farmer prices because of their limited bargaining power.

After picking up the potatoes at the farm, the assembler takes them to a washing shed where they are washed in large troughs and set out in the sun to dry. He then re-packages them in bags of 100 pounds and transports them to San José for sale in the wholesale market the following morning.

Participant Characteristics and Costs

To compare small farmer production and marketing patterns with those of large farmers, we asked farmers, assemblers and government agents

^{12/} Large farmers normally go to the market every Sunday even if they have no potatoes to sell. They seem to recognize the value of keeping abreast of market conditions.

what they considered as small farmers and small assemblers. The predominant answer was that small farmers plant less than 2 hectares of potatoes per year and small assemblers purchase and sell less than 16,200 hundredweight per year. We adopted those classifications for purposes of our analysis.

Small farmers sell primarily to small assemblers (71 per cent of all small farmer sales were made to small assemblers). Similarly large farmers sell primarily (80% of their volume) to large assemblers. We therefore concluded that within the region there exists a small production-marketing sub system and a large production-marketing sub-system.

Table 1 shows a comparison of the two in terms of selected socio-economic characteristics which were judged to indicate significant differences in managerial behavior and performance. A quick review of the table reveals what one might expect - participants in the small production marketing sub-system have access to fewer resources and are more conservative in their attitudes and management practices. In addition, their economic performance is inferior to that of participants in the large production-marketing sub-system.

Small farmer's yields and production costs per hundredweight were not significantly below large farmers ^{13/} However small farmers received lower average prices for their potatoes and thus had lower average net profits.

Figure 3 shows the production cost functions for small and large farmers. It indicates that small farmers reach their minimum average costs of U.S. \$1.25/cwt. at a production level of 780 cwt. or about 2.1 hectares. Large farmers on the other hand reach minimum average costs of U.S. \$3.53/cwt at a production level of 1585 cwt. or about 4 hectares. Thus, small farmers have a production cost advantage at production levels of less than 2.1 hectares and their minimum average production costs at those levels are significantly below the minimum production costs for large farmers.

^{13/} Production costs were calculated for both large and small farmers using the following different sets of assumptions about seed and labor costs: (1) retail seed prices with a market rate for family labor, (2) retail seed prices with free family labor, (3) wholesale seed prices with a market rate for family labor, (4) wholesale seed prices with free family labor. The differences in average costs between small and large farmers were not statistically significant at the .01 level under any of the above sets of assumptions.

TABLE 1. Comparison of Major characteristics of Small vs. Large Production Marketing Sub Systems for Potatoes, Costa Rica.

Characteristic	Small Production Marketing Sub-System		Large Production Marketing Sub-System	
	Small Farmers	Small Assemblers & Wholesalers	Large Farmers	Large Assemblers & Wholesalers
Resources				
- Education	Low (1-4 years)	Low (1-6 years)	High (5 years or more)	High (4 years or more)
- Market Knowledge	Low	Medium	High	High
- Land & Capital	0-10 Hec.(mostly owned)	Low	10 or more Hect. (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
Position & Perceived Role				
- Place of Residence	On Farm	Rural Area-Rural Town	Market Town & On Farm	Market Town-Rural
- Managerial Preparation	Limited	Limited	Relatively Sophisticated	Relatively Sophisticated
- Self View of Role	Rural Laborer-Farmer	Farmer-Intermediary	Progressive Business Man	Progressive Business Man
- Perceived Relation to Society	No Opinion	No Opinion	Vital Part of Changing Society	Vital Part of Changing Society
Attitudes				
- Future Orientation	Low	Medium	Medium	Medium
- Fatalism	High	High	Low	Low
- Trust-Non Family	Low	Low	Medium	Medium
- Innovation & Change	Low	Low	Medium	Medium
Business Management Practices				
- Specialization	Product Diversification	Product Diversification	Product Specialization	Product Specialization
- Economic Goals	Stable Income	Profit Maximization	Profit Maximization	Profit Maximization

TABLE 1. (cont'd)

Characteristic Patterns	Small Production		Marketing Sub-System		Large Production Marketing Sub-System	
	Small Farmers	Large Farmers	Small Assemblers & Wholesalers	Large Farmers	Large Assemblers & Wholesalers	
- Risk Aversion Strategy	Plant same amount each year; harvest when ready, produce and market 2 months of year	Adjust acreage with assembler before harvest, get assembler advice on harvest timing. Produce and Market 4 months or more of year	Buys on basis of custom or tradition; passes all risks to farmer.			
- Level & Quality of Market Information	Low	High	Low	High	High	
- Recognition of Community of Interest with Assembler	Low (45% sell to same assembler)	High (76% sell to same assembler)	Low	High	High	
- Stable Pre-Arranged Sales Agreements	Few	Many	Few (16% of total amount)	Many	Many (52% of total amount)	
- Product Sample Inspection	Necessary	Not Necessary	-			
- Size of average sale (cwt.)	79 1/2	217 1/2	13	217 1/2	36	
- % Use Washing-Drying Capacity	N.A.	N.A.	50%	N.A.	96%	
- Perception of Assembler Buyer or Farmer Seller	Friend or Relative	Friend or Relative	Friend or Relative	Business Man	Business Man	
Yield per Hectare (cwt.)	367	395	-			
Weekly Volume Handled (cwt.)	-	-	216	-	540	
Total Costs of Operation	\$ 5.99	\$ 5.93	\$ 2.87	\$ 5.93	\$ 2.57	
US\$ per cwt.	\$ 9.04	\$ 9.25	\$ 12.40	\$ 9.25	\$ 12.40	
Average Price Received	\$ 3.05	\$ 3.32	\$.49	\$ 3.32	\$.58	
US\$ per cwt.						
Net Returns						

1/ N.A. = Not Applicable.
 2/ Average for the representative sample taken.

Figure 3. Average Costs of Potato Production for Large vs. Small Farmers in Costa Rica.

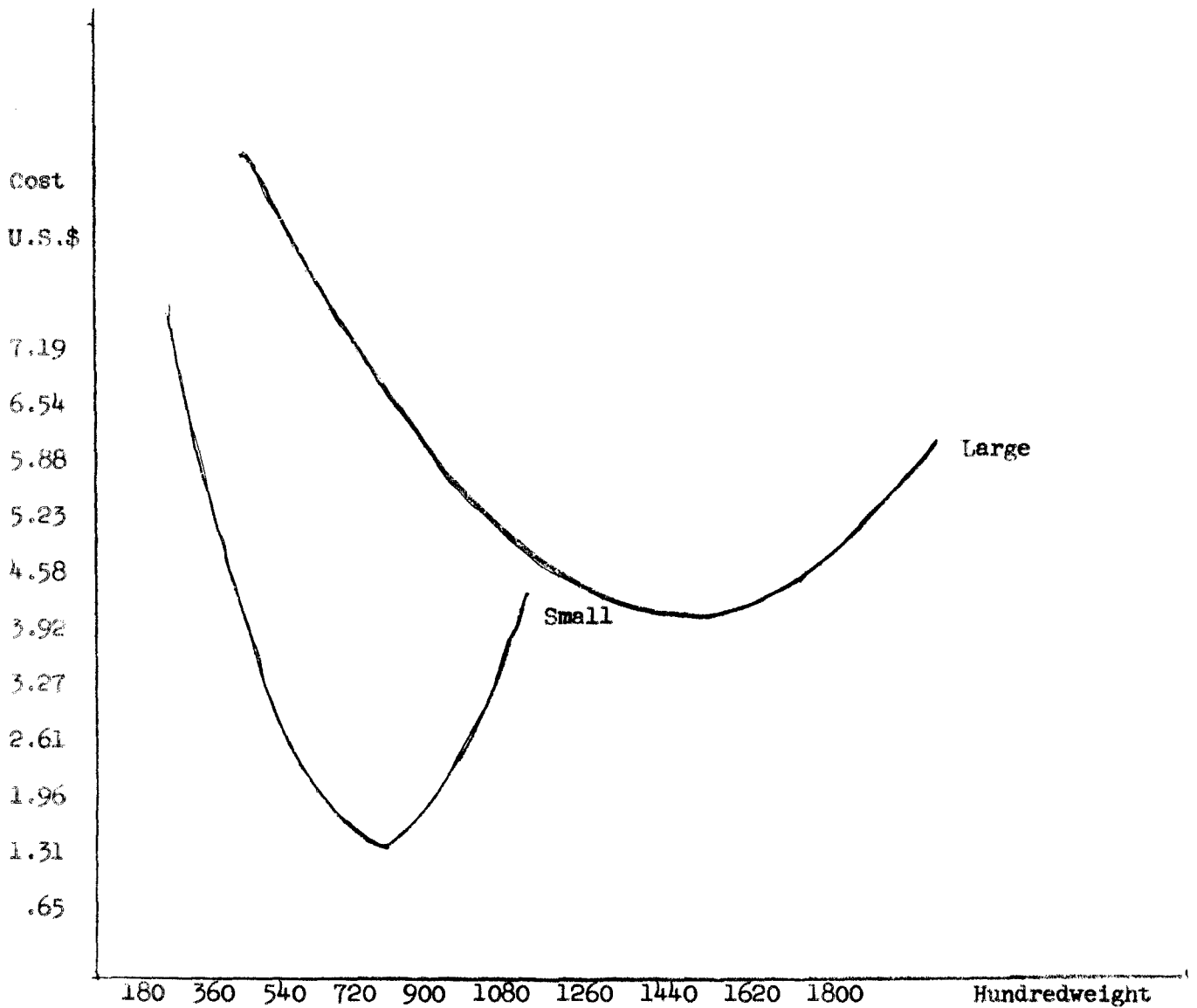
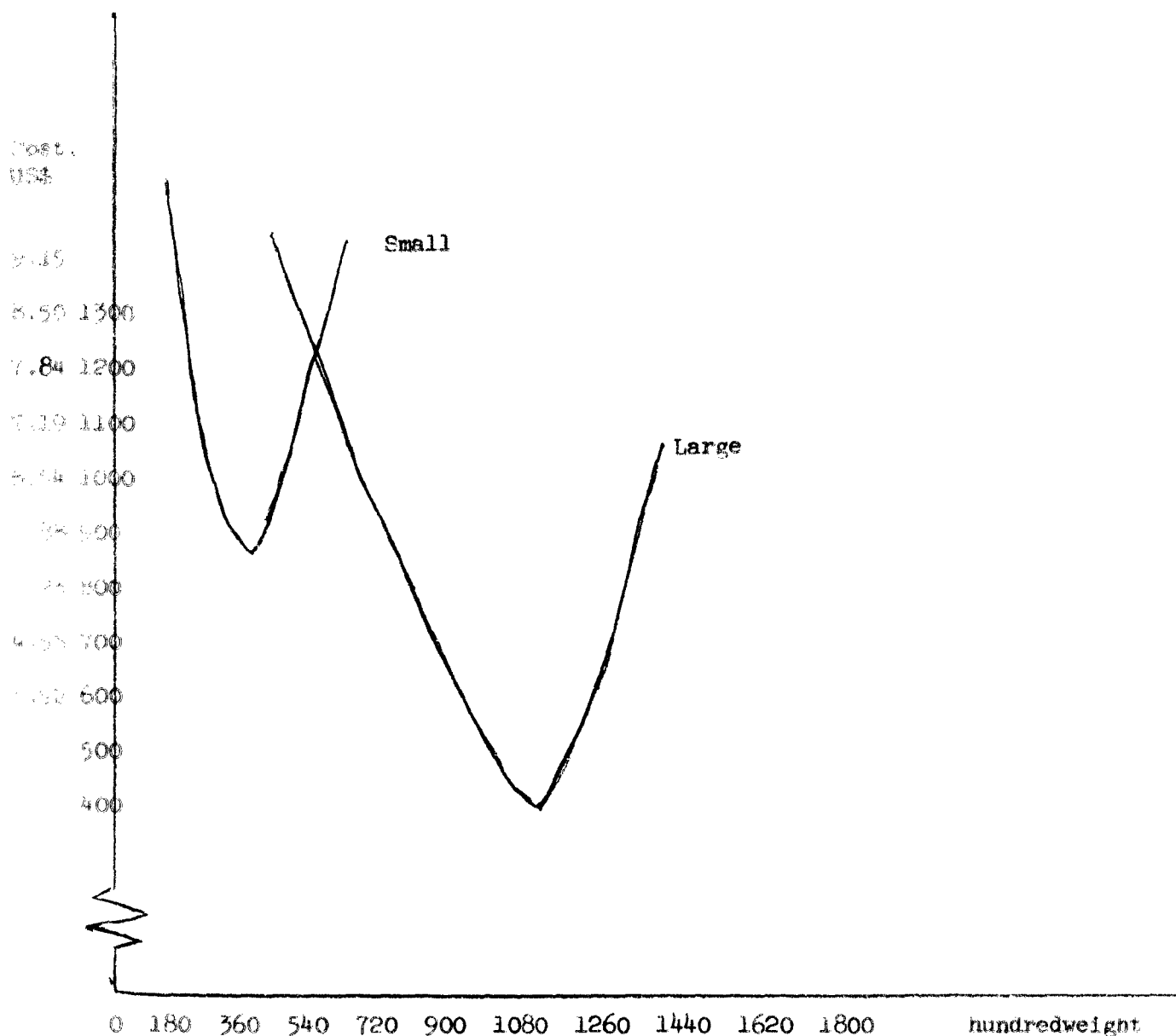


Figure 4. Combined Average Costs of Potato Production and Assembly for large vs. Small Farmers and Assemblers in Costa Rica.



But when assembler marketing costs are added to production costs the situation is reversed (Figure 4). The large production-marketing sub-system reaches minimum costs of \$3.11 per/cwt. as compared to minimum average costs of U.S.\$5.65 per cwt. for the small-production marketing sub-system.

The economies of scale in marketing activities and the coordinating efficiencies of large assemblers override the small farmer production cost advantages.

Conclusions:

Small potato producers in Costa Rica market their produce through small scale, limited resource intermediaries. And, while small farmers have a significant production cost advantage, the high unit marketing costs of their trading partners eliminates that advantage. Large farmers, on the other hand, by marketing through large assemblers and wholesalers with close coordination and larger volumes are able to overcome their production cost disadvantage.

There are significant economies of scale in potato marketing activities. The sources of those economies are: (1) close coordination between farmers, assemblers and wholesales, (2) transaction efficiency, (3) transport efficiency and (4) washing-drying efficiency.

We have listed the coordination factor first because it appears to be a necessary condition for the remaining factors. Large farmers and large assemblers have forward exchange agreements in which they implicitly recognize their community of interest. Large assemblers have similar agreements with wholesalers. Thus, large assemblers function as a kind of "channel captain" and thereby help to bring about order and stability for themselves and their trading partners. This also introduces an element of sub-system optimization. That is, the channel captain acts in such a way as to try to encourage behavior in his trading partners which will minimize his costs, their costs and therefore total sub-system costs. Thus, large assemblers and their counterpart wholesalers are able to achieve more efficient use of capital, labor and management factors in the buying, selling, washing, handling and transportation of potatoes. In addition, through exchange agreements, large farmers and assemblers manage to supply the wholesalers and retailers who provide "access" to upper income consumers. This means that large farmers and assemblers have not only stable demand (X_1 in figure 2) but relatively high prices, (P_1 in Figure 2).

On the other hand small farmers and their assemblers are left to supply the lower income urban and rural consumers who are much more price conscious. (Sections AB and BC of the demand curve depicted in Figure 2). There are no forward sales agreements so small farmers

(rationally) choose to produce about the same acreage each year and to plant on dates which permit maximum yields given their agro-climatic conditions. Their marketing strategy reflects an accurate expectation that short term price fluctuations are random. As potatoes near maturity, the small farmer takes a gamble to the market to determine if he will accept the market price of the week. Since he has not yet harvested, he has the option of delaying the sale of his crop for as much as 3 weeks.^{14/} This arrangement helps to avoid extreme short term market gluts. But since most small farmers are in the market during the peak harvest season, it does not prevent them from receiving lower average prices. Thus, small farmers are under triple market jeopardy. They receive lower prices, their risks are greater and their marketing partners have higher average costs.

Policy Implications

In this particular case, we conclude that government programs designed to reduce small farmers production costs without considering possible improvements in the institutional arrangements in the market place would have had relatively little beneficial effect on small farmer welfare. The basic cause of the small farmers' current disadvantage is the manner in which he markets his products.

The question arises: what could small farmers do to overcome the marketing disadvantage? Is it feasible for them to copy large farmer marketing practices and thus improve their competitive position? The answer to the latter question appears to be, yes, but only with partial success. The costs per hundredweight of negotiating, handling and transporting the smaller volumes marketed by the small farmer are significantly higher. Large assemblers are therefore not interested in buying from small farmers. And the small assembler is still likely to be dependent on the lower income market segment unless he is made clearly aware of the coordination strategy needed to compete with large assemblers for the high income segment of the market. However, the small farmer and small assembler could jointly agree to alter behavior in order to improve their competitive position. A second alternative would be for small farmers to organize and earnestly support a marketing cooperative. A third alternative would be for the government to pursue some type of marketing order or board legislation

^{14/} Storing potatoes "in the ground" for more than 3 weeks is not feasible because of the risk of insect and moisture damage. And even if that were not the case, most small farmers must immediately get what they can out of the crop in order to pay loans and purchase family needs.

which would assure equitable market access for all farmers and optimum efficiency in marketing activities. The role of the so-called 'channel captain' is important in order to insure the absence of弊弊弊 in planning, delivery, marketing, etc., even on a national and efficiency.

This case illustrates the need for serious and in-depth study of the inter-workings of the production-marketing subsystem before formulating policies. It also indicates that in the 'unfiltered' market the supposedly friendly invisible hand can become the not so friendly invisible foot for some participants. If equity is an important institutional development goal, government efforts might be directed toward:

(1) education, information and technical assistance for small farmers to help improve marketing arrangements;

(2) similar educational and technical assistance programs for small assemblers. (By adjusting their behavior toward "active coordination" of the market channel they might take on the function of 'channel captain' to their own benefit and to the benefit of small farmers);

(3) a careful review, with the cooperation of their farmer leaders, of institutional arrangements which might be used to improve small farmer's market access and efficiency;

(4) monitoring the competitive situation and taking policy actions to insure continued effective competition in the assembly and wholesaling activities.

A. Final word

The reader might be thinking that too much data remains more than substantiate the widely held belief that small farmers must be organized into cooperatives or some other form of group action in order to improve their situation. We do not necessarily agree with that conclusion.

First of all the case does more than that. It shows why and exactly what must be done to improve economic performance of the small potato farmer and his marketing system. In other words, the act of organizing a cooperative of small farmers in and of itself does not assure improvement in its member's welfare. And the decision as to what to do with a cooperative once it is organized is not a simple one. It requires a detailed and accurate understanding of the root cause of unacceptable small farmer performance.^{15/}

^{15/} James D. Shaffer, "On the Concept of Agricultural Commodity Development Boards as Institutions for Fostering Economic Development", Michigan State University, Mimeo, 1975.

^{16/} Potato farmers in the Carazo area found that act for themselves. They organized a cooperative without benefit of a sub-system diagnosis. They attempted to duplicate the working of assemblers and were unable to compete efficiently.

Second, the solution may not even require a cooperative or any other kind of formal association by small farmers. If they had a clear understanding of the problem and its root cause it might be sufficient to induce changes on the part of individual participants in the system. Subsequently, those individuals themselves might attempt individually to produce improvements in overall system performance. In this particular case, if small farmers and assemblers clearly understood the problem, they might begin to make forward sales agreements among themselves to exchange information on market conditions and to effectively compete in the more lucrative upper income segments of the market.

Our final conclusion then, is that while macro economic analysis, diagnosis and policy prescriptions are necessary conditions of agricultural growth, they should not be regarded (as they often are) as both necessary and sufficient. There is no substitute for diagnostic research at the local sub-system level in order to identify problems and determine how to resolve them. And that research should focus not only on agricultural production but on marketing arrangements as well.