

**Transaction Costs in Mexican Fruit and Vegetable Contracting:
Implications for *Asociación en participación***

by

David Runsten

Department of Agricultural and Resource Economics
University of California
Berkeley, California 94720

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I. Introduction

This paper focuses on fruits and vegetables. This is not the sector where *asociaciones en participaci\ n* in Mexico are most prevalent (they are mostly in poultry and livestock), but it is a sector that can be highly profitable and where Mexico has great potential. It is also one of the more labor intensive sectors in agriculture, and ejidos are certainly repositories of labor. If we can discover what the obstacles are to successful associations between ejidatarios and private capital, it may be possible to broaden the reach of the benefits of such production, creating a more diversified farm structure in fruit and vegetable production, with less reliance on armies of migrant workers.

When I first went to Mexico in 1980 to look at fruit and vegetable production, I went looking for the subordination of the peasantry to large investors described by Ernest Feder and others. The reality, however, was that the peasantry was largely marginal to export fruit and vegetable production, and often shut out of or discriminated against in domestic supply systems as well (so-called *mercados controlados*). It was not so much that they were being exploited, but that they were excluded from the most profitable activities--not so much that they were victims of capital, but that capitalism had not involved them enough.

There were basically four ways that small producers participated in fruits and vegetables. First, many rented their land to larger producers, either individually or collectively. The land went to those who had access to credit or irrigation or trucks or markets (Finkler). This was nominally illegal but widely practiced. The new laws are meant to legalize such rental, but will probably produce little change--the good lands were already in the rental market.

Second, many produced small acreages of fruits and vegetables that they sold locally or, more commonly, through intermediaries, who would often come in to harvest the crop. This also does not seem set to change.

Third, some ejidatarios were able to obtain contracts to grow fruits and vegetables for processing. While it was much more common that such ejidatarios were actually large producers who rented considerable extensions of land, there were examples of smallholders scattered throughout the processing crops, such as strawberries in Irapuato, processing tomatoes in Sinaloa and southern Sonora, avocados in Michoac<n, or a few cases of vegetables for the BajPo freezers.

Finally, certain groups gained access to production rights through government intervention. In particular, they obtained export quotas which were managed through the *Uni\ n Nacional de Productores de Hortalizas* (UNPH), later the *Confederaci\ n* (CNPH). Limits on acreages allowed many ejidatarios to participate in such crops as strawberries, mangoes, melons, and winter vegetables. They were seldom in control of the export system, but they participated. Of 16,000 producers under the UNPH in 1981, 70 percent were ejidatarios or comuneros (Stanford, citing UNPH).

The new laws have had a big impact on this last group. The government has eliminated any control by the CNPH over planting and exporting of fruits and vegetables. This will take time to work its way through perennial crops, but it has had an immediate effect in many short cycle crops. Free to associate

with whomever, many U.S. importers have stopped financing the traditional groups and turned to new regions and larger producers (Stanford; personal interviews). Although the government had intervened to grant them production rights, it had left the ejidatarios to fend for themselves as actual producers for 20 years. Undercapitalized, without research support, and without the market power to avoid intermediaries, they had become less and less competitive. Now cut off from most inexpensive sources of credit, there is the very real possibility that many of the thousands of ejidatarios who learned to grow these crops will be excluded.

The Mexican government has proposed to recapitalize Mexican agriculture through *asociaciones en participaci\ n*, essentially contractual joint ventures between ejidatarios and private capital, which FIRA has been experimenting with since 1980. This form was devised as a contractual model to circumvent prohibitions in the agrarian reform laws on outsiders utilizing ejidal land. The model was taken up in earnest by the government in 1990, and the *SecretarPa de Agricultura y Recursos Hidr<ulicos* (SARH) worked actively to identify and promote such associations (SARH, 1990). The SecretarPa de Reforma Agraria, Solidaridad, and FIRA are all government actors at present.

With the recent changes in the agrarian laws, it is no longer clear that this will be the preferred approach for private investment and association with ejidos, but it provides a basis to discuss the more general topic. This paper explores the obstacles to success in fruits and vegetables for contractual arrangements between small producers and private capital, and reviews some of the evidence about *asociaci\ n en participaci\ n* in Mexico.

II. Transaction cost determinants of agricultural contracting

Agribusiness firms generally have choices as to the economic form that crop procurement will take in any venture.¹ These choices run along a continuum from spot market purchases to various contractual relationships to vertical integration. In agricultural ventures, it is not uncommon to find combinations of these strategies. For example, the Dole corporation in California simultaneously produces fruits and vegetables on its own or on leased land, buys them through contracts with other producers, and buys them on the open market.

The choice of strategy is determined by relative costs, after factoring in the various associated risks. Such costs include not only production costs but also transaction costs. These latter are summarized by Jaffee as they relate to fruit and vegetable marketing:

"Each of the stages associated with a transaction carries with it attendant costs which must be borne by the transactors or by third parties. These can collectively be referred to as *transaction costs*. For example, search and screening costs arise due to imperfect information about the existence and location of trading opportunities and partners and about the properties of the

¹ At times the choice is restricted by local laws. For example, the long-term prohibition on foreign or corporate ownership of farmland in Mexico meant that foreign firms had no choice but to contract for local supplies.

goods and services available in the market. Negotiating or bargaining costs are resources spent in finding out the desire of economic agents to participate in trade on certain conditions. Transfer costs arise because transactors are located in different places, production and exchange normally do not occur simultaneously, and changes in title may need to be registered. Monitoring and enforcement costs are resources spent because of imperfect information on whether the parties will violate the terms of the bargain and provide compensation if they do so.

"Transaction costs are thus resource expenditures associated with information imperfections, the allocation and enforcement of property rights, and the 'frictions' of distance and time separating transactors. The tangible forms which transactions costs may take are numerous, including: personnel time, travel costs, communications costs, insurance costs, advertising and promotion costs, transport and storage costs, market research and consulting costs, arbitration, legal, and auditing costs, the costs of credit rating check and product inspection services, costs incurred in safeguarding property and in regulating trading practices, etc." (Jaffee 1991:10-11)

Jaffee further notes that the level of transaction costs in any instance is associated with the degree of asset specificity, the degree of uncertainty surrounding exchange, and the competitive market structure (Ibid.). High transaction costs can be significant barriers to the development of industries.

There has been a tendency toward a separation of marketing and production in agribusiness systems, which has led to widespread use of contractual relations in agriculture. This spread of "contract farming" in developing countries has been much discussed.² The point here is to note that the contracting firm often has a choice of suppliers and may avoid small producers because it perceives the combined production and transaction costs to be excessive. On the other hand, small producers may present cost advantages that offset higher transaction costs. The potential participation of smallholders in such contractual arrangements is fundamentally (if not completely) a question of costs in a market system, and it is with this framework that such developments will be assessed here.

III. Some Historical Experiences with Contract Farming in Mexican Fruits and Vegetables

In order to explore these issues in the Mexican context, it is necessary to examine some concrete examples of contractual relations in agriculture. The focus in this discussion will be on small-scale producers or ejidos in several fruit and vegetable sub-sectors.

Frozen Vegetable Industry

² An extensive bibliography is given in de Treville (1986). A rather Panglossian discussion can be found in Williams and Karen (1985), a more critical treatment in Glover and Kusterer (1990).

The Mexican frozen vegetable industry was one of the most dynamic sectors of Mexican agriculture in the 1980s. Based in the BajPo, especially in Guanajuato, and oriented almost entirely to export, from 1979 to 1989 the industry had an annual average rate of growth of 34 percent (Bivings and Runsten). Because it has been such a dynamic sub-sector, because the Mexican government had relatively little to do with its growth, and because it operates in a region where ejidatarios control over one-half of the irrigated land, it provides an interesting case of what happens when the "market" is left to operate.

The Experience with Contracting

The industry was initiated by Birdseye, a U.S. firm, which converted a dehydrator on a farm north of Celaya into a frozen vegetable plant in 1967. Because a group of U.S. canners (Del Monte, Heinz, Campbells) had earlier constructed plants in the same region to sell in the Mexican market, there was experience with contract vegetable farming (Morrissy; Rama and Vigorito). Birdseye contracted with many of the same farmers, who were, in fact, some of the largest growers in the region.

The U.S. firms chose to contract with these large growers for a variety of reasons, most related to transaction costs. First, vegetable production was seen as relatively risky in a region which chiefly produced grains.³ The processors looked for people who could bear the risk of crop loss and who also had some experience producing vegetables. Although all strata of farmers in the BajPo grew vegetables, the firms were introducing new crops into the local agronomic conditions, and this presented greater risks. Crop loss is not uncommon in the BajPo industry, whether due to freezes, hail, or disease, and there are several recent reports of new groups of producers losing their entire first crop of cauliflower (personal interviews; Dutronit and Oliveira).

Second, the contracts themselves were viewed as legally unenforceable. To make the contracts into legal documents, both parties would have had to go to town and have them notarized. Then, too, foreign firms taking legal action against local farmers would not be viewed favorably in the region. As a result, the director of the Birdseye plant in 1986 said they just wrote off bad debts in the case of crop failure and nonpayment or if the grower sold the product somewhere else (opportunism).⁴ Their remedy would be to not contract with him again. These costs were seen as costs of screening, and they obviously encouraged the firm to screen initially so as to minimize the possibility of noncompliance with the terms of the contract. That is, the firm is making an unsecured loan and uses screening to minimize risk of default.

Third, large growers were available and willing to produce. Many of them saw it as an opportunity to

³ In a survey of irrigated land in the Guanajuato BajPo in 1982-83, though 22 percent of growers produced some fruits and vegetables, those crops only occupied 12 percent of the land, while wheat, sorghum, and alfalfa together occupied 80 percent of the land.

⁴ Such opportunistic sales to other buyers are not a severe problem in the BajPo frozen vegetable industry, because growers are mainly producing broccoli and cauliflower, crops with limited alternative sales outlets in Mexico. It has been a serious problem in other areas, such as with strawberries in Zamora/Irapuato or processing tomatoes in Sinaloa/Sonora.

develop their ability to produce vegetables for international markets, and, in fact, beginning in 1975 the largest growers built their own freezing plants and integrated forward. Subsequently, when other large growers wanted to build such plants, they would first enter into contracts with one of the U.S. firms to learn the technology. In contrast, efforts by U.S. frozen vegetable firms in Guatemala to contract with large-scale producers in that country initially failed, forcing them to expand supply systems with small-scale indigenous producers in the highlands (Glover and Kusterer). However, over time it appears that there has been a tendency toward larger acreages in Guatemala as well (Glover and Kusterer; Rosset).

Fourth, dealing with small producers implied many additional costs. Not only did their numbers increase administrative costs, but they needed more services from the firm. For example, they needed more extension assistance; communication was costly as they often had no phones; they had to borrow or rent more specialized machinery (such as roto-tillers or high-pressure sprayers); they wanted to borrow operating capital in addition to receiving crop inputs; they made more numerous deliveries of smaller volume; they tried to get the firms to loan them money for tractors and other machinery; and they required more monitoring for pesticide violations. One U.S. firm was exasperated with the ejidatarios coming in for loans. The director said they did not want to be an investment bank, did not want to be the *patron*.

Fifth, contracting with ejidatarios until recently was fraught with the possibility that the State might intervene, as it had many times in the past. The example of the strawberry industry was close at hand.

Finally, one should not underestimate the hostility and contempt toward small ejidatarios among many in the agrarian bourgeoisie. This was particularly true in the 1970s, when the Mexican government channeled more and more resources toward the social sector. To the extent that the U.S. firms associated themselves with the large growers, they tended to reflect this bias. For example, the Birdseye plant was built on a large ranch, and the son of the ranch owner was the plant superintendent for many years. Interviewed in 1984, the director of agriculture for Birdseye--who, at the time, was from another Mexican farming family--expressed nothing but contempt for most ejidatarios. The only ejidatarios he would contract with, he said, were larger farmers who had purchased their own land.⁵

When the Green Giant plant was built in Irapuato in 1983, they adopted a more inclusive strategy, knowing that they had to develop a large group of suppliers and not wanting to go to the same group of growers and bid up the price. They worked both in new regions as well as with groups of ejidatarios. As late as 1986, they reported having difficulty finding enough growers. However, after 1987 the profitability of grain production declined due to changes in government policies, and a queue formed of growers willing to produce vegetables for the freezers. This allowed Green Giant to cut back on their dealings with ejidatarios, trying instead to "maximize production per grower" to cut transaction costs.

⁵At certain times, the U.S. firms were more open-minded about contracting with groups of small producers. This was true of Campbell's, Birdseye, and Green Giant. However, this uniformly occurred when anglos were running agricultural operations.

Birdseye also contracted with ejidatarios in Aguascalientes during the boom years of the 1980s. Birdseye tried to contract with them in groups but never achieved it. The cost of transporting the product to the plant and the construction of new freezers in Aguascalientes, however, led Birdseye to abandon contracting in Aguascalientes in favor of summer production with larger growers in new areas of northern Guanajuato. Subsequent contracts with ejidos in southern Guanajuato were also abandoned by the firm because "costs were too high."

Campbells began contracting with ejidatarios in Valle de Santiago because they needed small, pickling cucumbers and believed that the ejidos had the best access to the large amounts of labor the crop required. The firm was willing to bear the costs of dealing with them because they had little alternative. This ejidal program was expanded to include other crops in the 1980s during the frozen vegetable boom for the same supply reasons as Green Giant. The crash of the market led Campbells to get out of freezing vegetables in Mexico altogether.

Birdseye, Green Giant, and Campbells all contracted with groups of small producers when they could not get sufficient product from large growers. When this situation changed, however, and more land was offered for production than they needed, they moved to cut transaction costs.

The rapid growth of the industry in Mexico has been due mostly to the construction of integrated freezing operations by large growers. Table 1 presents a list of all known plants in the industry in early 1992. Some estimates of numbers of growers involved in producing for the plants is included where this was known. Only the Stokely plant in Zacatecas (Mexicana Congelados) was set up to include a large numbers of producers, but ironically Stokely has withdrawn from the operation, claiming that the costs have been too high. A very large investment in plants has involved a relatively small number of producers.

TABLE 1
MEXICAN FROZEN VEGETABLE PROCESSING CAPACITY

NAME OF FIRM	CITY	STATE	YEAR VEG START	EFFEC ANN. VEG. CAP. (million lbs)	EST. 1991 ANN. PROD VEG. (mill. lbs.)	Est. Num. of Growers
Birdseye de Mexico	Celaya	GTO	1967	60	44	110
La Huerta (Legumbres)	Aguascalientes	AGS	1976	33	25	90
Covemex/Alcosa	Celaya/Irapuato	GTO	1978	45	43	1
MarBran w/ Simplot line	Irapuato	GTO	1980	65	49	40
Productos Frugo	Salamanca	GTO	1982	30	10	1
Green Giant	Irapuato	GTO	1983	75	50	100
Cong. Don Jos� [Fox]	Le�n	GTO	1985	25	18	10
Expohort	Quer�taro	QTO	1986	30	25	75
Emp. Chapala	Zamora	MICH	1984	10	0	
FRUVEZSA	Zamora	MICH	1988	8	0	
Empacadora del Celio	Jacona	MICH	1985	8-10	2	30
Industrias Horticolas	Montemorelos	NL	1987	12-15	12	
Hortimex (Stokely)	Monterrey	NL	n.a.	25	0	
Legumbres Congeladas	Aguascalientes	AGS	n.a.	12	n.a.	
Mexicana Congelados	Luis Moya	ZAC	1990	20	14	300
Expor-San Antonio	Villagran	GTO	1990	60	28	50
Emp. de Hort. del BajPo	Jaral del Progreso	GTO	1990	20	n.a.	
CENSA (Simplot)	Morelia	MICH	1985	n.a.	n.a.	
Veg. Cong. de Irapuato	Irapuato	GTO	1987	15	10	own
FRESPORT	Irapuato	GTO	1987	15	12.5	30
La Esperanza de Miranda	Dolores Hidalgo	GTO	1990	6	5	
Ra�l Le�n	Irapuato	GTO			3	
Frexport (Bimbo)	Zamora	MICH	1991	15	n.a.	
Agroindustrial Export. (Tlaloc)	Tlajomulco (Irapuato)	JAL (GTO)	1987	16	8	
Cong. HortPcola Sonorense	Cd. Obregon	SON	1990	10	7	1
	Chihuahua	CHIH	planned			
TOTAL				639	365.5	

Source: personal interviews

Putting a Price on Transaction Costs

Although they are no longer in the frozen vegetable business, after the crisis set in during the 1980s and effective demand fell in the Mexican market, the Campbells Soup plant in Guanajuato began freezing vegetables for export. Building on their experience with pickles, they tried to contract with some groups of ejidatarios to expand supply. Campbells was the only firm that seriously tried price discrimination with the small producers. Campbells offered seven different types of contracts, which enabled them to price services according to what producers wanted to use. In 1986, they offered a contract with complete services (including all operating capital, use of specialized machinery, seedlings, inputs, regular technical assistance, and some risk-sharing in the event of crop loss) that had a base price of 6.5 cents per pound of broccoli. At the other end of the spectrum, they bought broccoli on the spot market at the plant door for 13.5 cents per pound. The cost of all these services--transaction costs--was substantial.

The policy of the other contracting plants to have at most two contracts (one with some services, one without) did not really address the added costs of dealing with small producers. Most producers were relatively large and the only services they wanted were the chemical inputs (that the firms imported in bulk) and perhaps the use of some specialized machinery. As a result, most plants could not recover all of the costs of contracting with small producers because they were paying them too much for the product.

In fact, the director of agriculture at Campbells said he was pressured by the other plants not to price discriminate and to maintain prices at a common level. Therefore he was unable to pay the no-service growers a high enough price nor the full-service small producers a low enough price to account for all costs. Even his seven contracts were insufficient to recover all of the transaction costs involved with the ejidatarios.

The attempt of buyers to price transaction costs is one reason why it often appears that price received is correlated with size of producer, which Rosset laments in his data from Central American melons. It is a result not only of the weaker bargaining power of small producers but also of the real costs incurred in dealing with them.

One Mexican processor who had begun to contract with groups of ejidatarios, and who had worked closely with them, estimated in 1991 that their per unit operating costs to produce broccoli were only 55 percent of his own. Why was this? First, they could often hire labor more cheaply within the ejido. This is partly from convention, but also reflects the cost of transport (including time) from the village to alternative employment and their neglect of paying any benefits. Second, they could use unremunerated family labor. Third, land rents (and implicit rents) were lower within the ejido because of the nominal illegality of renting land; most of it was done on a sharecropping basis. Fourth, they managed small acreages and could catch pest and disease problems sooner, thereby limiting their use of chemicals. Finally, they averaged 20 percent higher yields, no doubt due also to the small scale of production.

This firm had also chosen to contract with ejidos that were located close to the main highway and to limit the total number of producers to a size that could be served by a single agronomist. The contracted growers had to come get their own transplants and fertilizers from the firm's ranches and product deliveries were made at the same locations. Chemical control decisions were made by the firm and the agronomist dispensed the chemicals directly from his truck. By thus limiting the transaction costs, risks, and overhead of the contracting system, an arrangement was reached that satisfied all parties. Once again, however, the reluctance of large growers in the region of this firm to produce broccoli or cauliflower induced them to contract with ejidatarios.

It is clearly possible to incur significant transaction costs in dealing with small producers, price those costs appropriately or organize one's dealings with them in an efficient manner, and still have a viable system. There are success stories. Dutronit and Oliveira describe other cases of success and failure in broccoli contracts between a Mexican processor and groups of ejidatarios. It is clear that a great deal of the success depends on the sensitivity of the contractor to the needs of the small producers and on the careful transfer of technology appropriate to their situation. The future of such associations really depends on the effort the contracting firms put into this interface with the ejidatarios, or, as in the Los Pinos case in Guatemala, the effort a third party provides to support smallholders' participation. The reluctance or ability of many firms to deal with the transaction costs constitutes a significant barrier to ejidatario participation.

Strawberry Industry

Without entering into a long history of strawberry production in Mexico (which dates to 1888 in Irapuato), it suffices to note that export production began after World War II, when U.S. brokers set up freezing plants in Irapuato, and expanded rapidly in the 1960s. Growth spilled over to Zamora, Michoacán, and the industry expanded from 17 freezing plants in 1966 to 33 plants by 1972, with far too much capacity.

At the same time, a considerable amount of the expansion in acreage had been accomplished through the use of small producers, many of whom were financed by processors, and the government had even constructed some plants in Zamora for the social sector. Crises of overproduction occurred in 1970 and 1974. The Mexican and U.S. governments agreed to limit total frozen strawberry exports from Mexico, and quotas were established to allocate production in Mexico. Control was ceded to the growers through the UNPH, which limited acreage. Loss of control discouraged foreign investment in the industry, and most larger growers exited, leaving the strawberry production largely to groups of ejidatarios. Fresh production became increasingly oriented towards the Mexican market and freezer production declined.

Quotas on acreage, which were instituted after the overproduction crisis of the early 1970s, were finally removed in 1988. The Salinas government acted on June 28, 1990 to retake control over certificates of origin and make them available to independent producers who were not members of the local CNPH chapters. Up until that point, the CNPH had been able to collect a fee for every carton

shipped, whether fresh or frozen.

This brings to a close a difficult chapter in the history of the Mexican strawberry industry. Suffice it to say that over the past 20 years relatively little has been done to improve strawberry production in the Bajío. The CNPH chapters of growers in Zamora and Irapuato are now considered as independent firms by the Mexican government. Each of them controls processing facilities, which are the only things holding the growers together. In many ways, the industry is reverting to its form in the 1960s, except that the past two decades weigh heavily on people's perceptions of the possibilities for the central Mexican industry.

There are several lessons to be learned from this industry. First, overproduction was exacerbated by the Mexican government's willingness to finance processing plants for groups in Michoacán, responding in part to charges that U.S. brokers controlled the industry (Feder). Despite twenty years of nominal control by the CNPH, U.S. brokers still control the industry. That is the way the institutional strawberry market is structured in the United States.

Second, having intervened and given the local growers control over production, the government then did virtually nothing to improve production. In the meantime, growers in the United States developed and adopted significant new technology. One of the principal advantages which California possesses is the ability to harvest for long periods, typically six months or more, which, combined with intensive technology, has led to much higher yields than in other competing regions. Table 2 presents average yields in recent years for most of the North American strawberry regions. One can see the tremendous advantage which California has gained, the result of decades of breeding efforts, the use of methyl bromide/chloropicrin fumigation on an annual basis, and a heavily-researched system of cultural and pest control practices. The fumigation alone considerably increases yields, but costs \$1,000 per acre. The availability of capital to invest is thus also an important advantage to California.

Most regions of the world now use California strawberry varieties or their derivatives. Mexico is no exception. Plants are imported from California, and in central Mexico they are then multiplied in nurseries owned by growers. This puts Mexico at an immediate disadvantage, since the plants were not bred for central Mexican latitudes. While production practices in northern Mexico are the same as in California, in central Mexico many traditional practices of dubious value are still used. For example, many growers in Michoacán flood their fields before planting. Irrigation or fertilizer applications are often not timed or quantified in any scientific manner, and sprays are often used after the point at which they could have the greatest effect. The results of these technological differences are most evident in yield results. The Bajío has even lower yields than Florida, which has a shorter season.

**TABLE 2
STRAWBERRY PRODUCTION AND YIELD BY REGION**

Region	Average Yield 1988-90 U.S. tons per acre	Avg. Production 1988-90 U.S. tons
California	23.5	450,157
San Diego	24.2	10,780
Orange-Los Angeles	17.8	50,190
Oxnard	29.4	107,678
Santa Maria	21.9	86,720
Watsonville	24.8	183,912
San Joaquin valley	11.3	2,805
Washington	3.6	7,433
Oregon	5.6	38,683
Florida	12.2	63,233
Michigan	2.7	6,450
Mexico	7.7	117,727
Guanajuato	7.0 *	n!a.
Michoacan	10.7	n!a.
Baja	12.8	8,219

* estimated

Source: California Processing Strawberry Advisory Board; SARH, Baja California; CNPH in the BajPo

Third, given the reality of a free trade agreement (and strawberry duties have been eliminated by NAFTA), Mexican processors and U.S. brokers are trying to shake off the stagnation of 20 years and improve the productivity of the industry. Otherwise, they run the real risk not only of missing export opportunities but of losing most of the Mexican market to U.S. producers. Although the brokers have done a poor job of transferring technology (as compared, for example, to the frozen vegetable industry), California-style production systems have been tried in the Bajio a couple of times in the past 20 years, but inadequate technical support led to failure. Several large growers are now trying it once

again, but most still lack the technical and research support that has been so important to California.⁶ The California system is costly, and requires large investments. The growers in central Mexico have not had access to sufficient capital, and banks and investors are wary of the industry after 20 years of stagnation and political infighting.

However, some of the casualties of this process will likely be many of the small producers who are not in a position to adopt expensive technology because they are self-financing production. Some larger growers who are linked to processing facilities are now renting increasing acreages of land and bypassing small producers altogether. The smallest growers, who use only family labor and sell their berries in local markets, will survive because their costs are low, but the middle may disappear. Only targeted projects oriented toward improving technology, providing credit, and seeking niche markets, such as organic production, are likely to retain most strawberry-producing ejidatarios.

Melons

The melon industry in Apatzingán, Michoacán, has experienced a similar transformation with removal of CNPH control. According to Lois Stanford, once producers gained control of the industry in Apatzingán, there was a constant search by U.S. buyers for other regions of production. From 1970 to 1988, export production was developed in Colima and Guerrero with large-scale commercial producers, in contrast to the large associations of peasant producers in Michoacán (in the late 1980s there were over 2,000 melon growers in Apatzingán). U.S. buyers argued that they obtained higher yields and lower costs in these other regions.

Within Apatzingán itself, new entrants in the 1980s increased the supply of melons, despite attempts by the associations to control planting. The cumulative impact came in 1987-1988, when a glutted market caused prices to fall sharply and left almost 4,000 hectares of melons unharvested. According to Stanford, the peasant farmers then ignored their contracts and sold their melons to anyone who would pay cash. As a result, some local associations could not pay back crop advances to U.S. buyers, and so the buyers stopped financing peasant associations. With the removal of CNPH control, the buyers have been able to bypass small producers altogether and work with large commercial producers who rent land.

The melon story exhibits many of the same features as strawberries. The government granted the producers the right to control production, but then failed to support the industry in a way that would keep it competitive. The industry began to suffer from inability to control insects, viruses, and nematodes, and yields declined. When left to their own devices, buyers turned to other regions with fewer disease problems or to large-scale production to try to lower costs and improve productivity.

Conclusions to the Case Studies

⁶ One large California firm is reportedly engaged in trials in the Bajío with the California production system. This firm has the resources and research capability to make it work, as they are engaged in long-term breeding and research. Their eventual decision to stay or not should be an indicator of the future viability of the industry.

The case studies indicate the marginality of small producers in much of fruit and vegetable production in Mexico. For a variety of reasons, usually reflected in costs, processors and other marketing agents have been reluctant to enter into contracts with them. Where the government intervened through the CNPH it succeeded in including large numbers of ejidatarios, but nothing was done to improve their competitiveness. Therefore, when entry was opened up many of the small producers were abandoned for more cost-efficient arrangements. This suggests that if the government believes there are positive social externalities from diversifying ejidatario agriculture into more fruits and vegetables, it would do best by focussing on making them more competitive rather than dictating their inclusion. Support of credit unions and other cooperative organizations controlled by the producers, research, information, and extension assistance are all potential ways to accomplish this.

IV. Recent Experience with Asociaciones en participaci\ n en Mexico

There are two lists of *asociaciones* in Mexico that can be reviewed for some lessons. First, FIRA administered a set of projects throughout the 1980s, which have been analyzed by several authors. Second, a broader effort has been made by the government to promote *asociaciones* since 1990, and many of these have been included in a 1992 list of the SecretarPa de Reforma Agraria, which is analyzed here.

FIRA

FIRA has had a *Programa Especial de Asociaci\ n de Empresarios Agropecuarios con Productores de Bajos Ingresos* since 1980. Dutrønit and Oliveira report that FIRA has financed more than 200 asociaciones over the decade, of which 37 were functioning recently. This suggests that most of the projects, for whatever reason, did not survive as joint ventures.

MuZoz and Fontes reported on 94 projects realized by FIRA by 1990. Of these, 44 percent were livestock projects (25 percent broilers, 8 percent eggs, 7 percent hogs, 4 percent milk), 15 percent were in flowers, 11 percent were horticulture, 4 percent in grapes, 18 percent in agricultural processing, and 8 percent in forestry, aquaculture, and other activities (MuZoz y Fontes). The clear intent of the projects was to foster relatively high-value activities that intensified the use of land and labor.

MuZoz and Flores arrive at several interesting conclusions regarding this group of projects, which are most clearly expressed in the livestock ventures. First, they argue that these projects demonstrate the clear logic of the participation of the private firms, insofar as they are attempting to expand their operations without investing their own money in land and buildings. As the representative of TRASGO noted in a conference in Mexico City:

"Para nosotros como grupo, representa una gran beneficio el saber que contamos con una fuente segura y a largo plazo de abastecimiento de materia prima, sin invertir en

activos ni en capital de trabajo en granjas avPcolas..." (Lic. Arturo González Lima, México, D.F., 1 Abril 1992)

This type of contract farming has been common in broiler production in the southern United States for over 30 years. The farmer owns buildings which cannot be used for anything else and so becomes dependent on the firm for inputs, technology, and marketing. The firm avoids tying up capital in fixed assets. The form of contract is at times a problem, because the outgrowers have little bargaining power. The oversight by the government in Mexico is probably useful in this regard.

Second, this is made even more advantageous because the ejidatarios can borrow money at lower rates of interest, thus increasing the profitability of the projects. While real rates of interest have risen in Mexico as inflation has declined, small farmers ("low-income producers") were still eligible for relatively cheap credit in 1991, as shown in Table 3. Of note is the high real cost of credit in Mexico (7.3 percent) to the private sector for activities such as FIRA was promoting in these asociaciones. While this rate represented a significant decline over the previous few years (due to the general decline in real interest rates in Mexico), it was still almost twice the real rate of interest prevailing in the United States and Canada in 1991 (Canadian International Trade Tribunal, 1991). While export-oriented ventures in Mexico currently have access to loans in dollars at more competitive rates (though it still costs more to borrow dollars from Bancomext than from a U.S. bank), virtually all of the livestock ventures are oriented toward the Mexican market. The inescapable conclusion is that the Mexican government is subsidizing the *asociaciones* through credit, and that this is a powerful incentive to induce the participation of the private sector.

Third, MuZoz and Flores note the leading role of the State in promoting the *asociaciones*. Some businessmen have said they are doing it out of "social duty." Since 1990, several other dependencies of the government have taken an even more active role in beating the bushes for new projects and trying to push them through to realization. Apparently, no foreign firms appeared on the FIRA list (MuZoz y Flores), although there are several which have since joined. All of this suggests that the program has a social and political purpose that the government is actively promoting, and that some of the projects may not be economically viable at market prices.

TABLE 3
MEXICAN INTEREST RATES TO AGRICULTURE, 1987-1991

	1987	1988	1989	1990	1991
Nominal Rates	Percentages				
Low Income Producers	69.0	52.6	42.8	34.8	19.8
Other Producers					
For Basic Grains	93.6	61.7	47.6	38.9	23.4
For Other Products	97.9	65.0	52.6	42.9	27.4
Inflation	159.2	51.7	19.7	29.9	18.8
Real Rates					
Low Income Producers	-34.8	0.5	19.3	3.8	0.8
Other Producers					
For Basic Grains	-25.3	6.6	23.3	6.9	3.8
For Other Products	-23.7	8.8	27.4	10.0	7.3

Source: FIRA (from Bivings and Runsten: Real interest rate (%) = $\{[1 + \text{nominal interest rate} / 1 + \text{rate of inflation}] - 1\} \times 100$)

MuZoz and Flores point to the VaquerPas project as evidence of this. Conceived as a large-scale effort to grow corn and beans with a high level of technology, the project apparently would not have been profitable without a series of subsidies, especially debt-equity swaps (MuZoz y Flores, p. 20). Similarly, a proposed project between Spanish capital (Costa Brava) and ejidos in the south of Sonora never came to fruition because the project proposal was riddled with errors that guaranteed that it could never be profitable, a fact that the government of Sonora was forced to point out. Another project to join 10,000 ejidatarios with the Canelos in the Huites/Fuerte-Maya irrigation district has a large subsidy from *Solidaridad* built into it, probably the first of many if it is realized.

Nevertheless, the broiler projects have been relatively successful. The firms have discovered that the contract grow-out is often more efficient (better meat to feed ratio, lower mortality) than many of their own integrated operations (González Lima; MuZoz y Flores). Dutronit and

Oliveira report similar results in their study of contract egg production with BACHOCO. Of course these are technical, not economic measures, and it may well be that all family labor time is not being valued in the contract ventures. This is certainly the case in much of the fruit and vegetable production, as discussed above. But this is of course the "advantage" of the peasant producer, as Chayanov noted long ago. These *asociaciones* present the small producers with new opportunities that often allow incomes far beyond alternatives, even if the implicit wage is low. As noted at the outset, the problem of small producers in Mexico has more often been that they are left out than that they are exploited. If small producers have a viable means of exit, then they can decide for themselves.

Secretaría de Reforma Agraria List of Projects

A list of 140 *asociación* contracts signed since 1990 was reviewed. Some of these projects were financed by FIRA, but there is probably little overlap with the FIRA list discussed above.

There were 35 livestock projects, some of which were quite large and involved dozens of ejidos. This sector is clearly the main area of activity in the *asociaciones*. There were five cattle-feeding enterprises and several hog operations that were being built from the ground up, but for the most part the ejidatarios already had buildings that were sitting unused. And a large percentage of the ejidatarios owed the banks money for the buildings and their past operation. Of 30 chicken and hog projects, at least 22 of them concerned rehabilitating buildings and paying off overdue loans (*cartera vencida*).

Overdue loans also cropped up as a justification in several fruit and vegetable projects and a feed plant. But this had apparently become the policy of choice in Tamaulipas for all types of products, as approximately 25 of the projects in that state involved ejidatarios who produced grains or other commodities and who were teamed with an *empresario particular* to co-sign the loan, since they had unpaid debt. In most of these latter cases, the empresario paid off the debt, provided working capital (usually including wages for the work), and rehabilitated buildings or irrigation works in exchange for the crop production over a period of years.

Thus, many of the *asociaciones* are marriages of convenience to repay debts, relatively complicated means of renting out the land. The banks are essentially requiring the creation of such *asociaciones* in order for the ejidatarios to receive further credit. In this sense, the program could be seen as a means to cut government loan losses to agriculture.

There were 10 projects in forestry (mostly mills developing supply sources), 9 projects in rice, and a variety of different field crops in special situations, most of which could be termed contract farming (*compra-venta*). These last included such things as Bimbo contracting for wheat and VISA contracting for barley for beer.

In the fruit and vegetable sector, there were 10 projects in bananas and two in mangos, mostly

real joint ventures with contracts of from six to twelve years. Similarly, raisin and wine grapes were being financed in Sonora and La Laguna for 10-year periods. Most of the rest were short-term production contracts or marketing agreements, including pineapple, melons, potatoes, pickles, broccoli, and chiles.

A large Sinaloa firm installed drip irrigation for tomatoes on 1100 hectares of ejidal land in Baja California. The ejidos were to inherit the drip system after 5 years, but it was unclear whether they would have any water to pump through it, or whether the contract was in fact signed to gain access to their water.

Another firm in Sinaloa was to build an irrigation canal to irrigate 2,000 hectares of land in that state in exchange for a share of the proceeds for some years. A fruit and vegetable broker agreed to fix up a packing shed, fix the irrigation system, and pay the debts of two ejidos in Tamaulipas in a joint venture to grow chiles, corn, and melons on 835 hectares.

Conclusions to the Asociaci\ n experience

Several things were clear in reviewing these projects. First, as noted above, much of the activity revolved around unpaid debts and means to resolve credit-worthiness problems for the banks. This might be driving government promotion of these schemes as much as anything, but it does have the advantage of putting fixed assets back into use.

Second, many of the arrangements are practices which were commonly done under the table in the past. For example, the Baja tomato arrangement is a relatively common practice, where a private investor makes an investment such as irrigation, pays rental on the land, and probably also hires some of the ejidatarios, and the ejidatarios end up with the investment good at the end of the contract. What has changed is that now the private firm can borrow money from the bank to finance such arrangements. It may even be able to borrow the money via the ejidatarios at preferential rates.

Third, although some of the firms are large enterprises that can guarantee access to markets, some are not, and it remains to be seen how much technology and know-how are transferred to the ejidatarios, and what happens once the debts are paid and the projects are concluded.

Fourth, much of the private participation is motivated by access to cheap capital via the ejidatarios or access to earlier investments made by the Mexican government in the ejidos. For relatively small debt payments, one can gain access not only to land and labor, but also to irrigation, machinery, animal structures, packing sheds, and so forth.

Fifth, there are relatively few instances of foreign capital entering into *asociaciones*. This may be due to a history of foreign capital using Mexican intermediaries to deal with illegal renting of ejidal land.

Finally, these lists of projects are merely the tip of the iceberg in terms of relations between

ejidatarios and private capital. Given the numbers of ejidos and comunidades in the country (about 30,000), there is still much to learn.

V. CONCLUSIONS: Market Failures, Peasants, and Contracts

Adopting contracting with ejidatarios as social policy in rural Mexico is essentially an attempt to compensate for incomplete institutions and market failures. However, the experience with contracting shows that it solves some of these problems better than others.

Credit

There have been very incomplete credit markets in Mexico and the situation has worsened in the past decade. Contracting solves the problem of operating capital, as either the contractor provides the money and/or inputs or the contract itself serves to induce the bank to loan to the producers. However, short-term production contracts--which are common in much fruit and vegetable production, for example--do not solve the problem of investment capital. Only longer term contracts or joint ventures that expressly provide for investment will buy investment goods for ejidatarios. In reviewing the recent experience above, it was apparent that the banks have had some success in inducing private entrepreneurs to finance the rehabilitation of irrigation works and poultry and hog structures in exchange for being able to market their production. There were, however, very few instances of infrastructure built from scratch, and it remains to be seen whether even the offer of subsidized credit will be sufficient to induce long-term investment on ejidal lands, that is, whether private investors will substitute for the role the government has played in this regard.

Extension and Technology Transfer

Since the government generally provided very little extension service to small producers, and what it did provide was of questionable value, the role of contractor (or *asociante*) as provider of technology and knowledge is a potentially important one. There are two problems.

First, the cases of frozen vegetables and strawberries in central Mexico noted above are also examples of highly contrasting degrees of technology transfer and extension. The large U.S. frozen vegetable firms taught people how to grow the crops, worked to develop systems of production appropriate to local conditions, introduced new varieties, and joined with growers to solve pest and disease problems. In contrast, the U.S. brokers in the Mexican strawberry industry transferred little technology to Mexico, which allowed the productivity gap between Mexico and the United States to widen.

It is widely observable that producers who need extension assistance are better off under contract to a firm that is itself a producer--or has the resources and commitment to act like one--than they are dealing with firms that are mainly marketing intermediaries. This is an important conclusion of Dutronit and Oliveira in their study of FIRA projects⁷; it is apparent in Stanford's discussion of

⁷They conclude: "...en la medida en que el otro productor sea una empresa establecida e integrada en la IPnea

the melon industry in Apatzingan and in Rosset's analysis of melons in Central America, and it appears in Jaffee's study of contracting in Kenya. Brokers are not good partners for peasants.

Second, even with a responsible and committed firm, small producers are easily lost in a crowd if the firm is dealing with a variety of contractors. This raises the question of the appropriateness of the technology being transferred. If the firm is offering a production system which it uses itself, or which is used by large farmers, it may not be the most desirable technology for peasants, given the risk considerations, access to family labor, and capital constraints typical of small producers. Dutronit and Oliveira's recommendation that the ejidatarios hire their own technical assistance to also act as an intermediary with the contracting firm is a good one in this regard. It would be even better if there were an adequate supply of such assistance in Mexico, private extensionists who were educated to be sensitive to the needs and constraints of small producers. Provision for such private extension also relieves the contracting firm of part of the burden of transaction costs inherent in offering extension to large numbers of small producers, and may make such associations more attractive. The policy of FIRA to require such assistance is helpful, but would be more viable if the government were paying sufficient attention to the training of human resources.

Marketing

Markets are very thin in many specialized agricultural products. In such commodities as fresh fruits and vegetables they are also very risky. Associations with established firms that have secure access to markets can greatly lower the risk of peasant participation. As with technology transfer, all studies concur on the importance of avoiding speculative intermediaries. Rosset cites examples of small producers in Central America who were forced to take large losses that they could not afford because they had dealt with intermediaries who were unwilling to absorb low market prices or who simply disappeared. Jaffee emphasizes similar problems in export fruit and vegetable markets in Africa. To the extent the State or banks create these associations, they need to bear some responsibility for adverse outcomes. There should also be bonding of intermediaries, a fund to pay growers when the intermediaries fail, and some means for settlement of disputes.

Marketing barriers are probably the most significant obstacles to peasant participation in lucrative products. The great irony of this discussion is that research demonstrates that peasants' interests are often better served by large, even multinational companies than by the typical intermediary. This directly contradicts most of the discussion in Latin America in the 1970s, which held that peasants would become slaves to international capital. But of even greater importance than size is an honest commitment to deal with groups of small producers as partners.

de producción de la asociación, conozca mercados y políticas de comercialización y domine la tecnologíaPa utilizada en el proyecto, se asegura una mayor estabilidad a la asociación ante quebrantos, mejor calidad en la asistencia técnica y mayor asimilación de tecnologíaPa por los productores de bajos ingresos." (Dutronit and Oliveira, 1992, p. 569)

Research and Education

Although contract farming can do a good job of substituting for failed technology markets, it generally does not do much to solve agronomic problems that require significant research. One has only to look at the export fresh fruit and vegetable industry in Mexico to find countless problems of soil-borne disease, poorly adapted varieties, salinity, erosion, and pest resistance, all leading to low yields.

A recent study of a variety of fruits and vegetables in the context of the North American Free Trade Agreement (NAFTA) showed that Mexico's ability to compete with the United States was severely handicapped by consistently lower yields (Cook, et al.). And in a crop such as avocados, where Mexico has superior yields and much lower costs, they have been kept out of the United States market by a pest problem and the lack of research to address it. Mexico will not be able to take advantage of the opening provided by NAFTA if research deficiencies are not addressed.

The belief that private capital will undertake such research is largely illusory. The attempts in Sinaloa to tax fertilizer to pay for research have been insufficient. The efforts of frozen vegetable processors to solve problems in the BajPo are underfunded and they all complain that they cannot do it themselves. Producers in Mexico appear willing to contribute to applied research on their crops, as they do in the United States, but they are unwilling to finance the educational infrastructure and the long-term basic research that is needed.

Instead, what usually occurs is the problems become so severe that an industry moves on to another location. Stanford reports that the decline in melon production in Apatzingán is partly attributable to diseases and low yields that made other regions more attractive once CNPH production controls were removed. A 1983 survey of growers in the BajPo found that the crop most commonly abandoned in the region was dry beans (frijol) because of disease problems (author's interviews). Asparagus growers in Guanajuato have cut back production and exports as they try to solve what some believe is a viral problem, which has drastically lowered some yields. The long-term viability of an internationally competitive agriculture depends on an infrastructure of research that currently does not exist in Mexico, and for which contract farming will not substitute. The special needs of small producers are particularly ill-served by depending on imported technology.

Similarly, no association with private capital can solve the problems created by a lack of basic education. In some sense this is one of the greatest obstacles to the *asociación* model, because it widens the gulf between the contracting parties. It argues even more strongly for the use of sensitive private extension to assist the ejidatarios in adopting new technology and coping with the demands of their relationship to a larger firm. The relative lack of schooling leaves peasants unprogrammed to think in industrial ways. The peasant household has a logic that may include growing corn, selling family labor, and respecting social obligations. This reality must be recognized and respected in the design of associative projects.

Organization

Finally, an obvious means to cut transaction costs for smallholders is through organization, but contracting parties are unlikely to organize ejidatarios. By forming democratic organizations and presenting a united front, ejidatarios can absorb the transaction costs collectively. The SARH/CEPAL survey of ejidatarios in 1990 showed a quite small amount of ejidal organization for marketing purposes and this is an obvious obstacle to diversification.

An organization such as a cooperative can also serve to spread risk by averaging prices received from volatile markets. The Del Cabo cooperative in Baja California Sur functions in this manner, paying growers a fixed price for all deliveries of a given product. By adjusting the payout, growers can retain more or less capital at the cooperative level for joint projects.

Asociación en participación presupposes the existence of such organizations of ejidatarios, and it is here that many problems arise. For the government or FIRA to ask that an organization be formed to participate in one of these contractual schemes is problematic, because it is not created organically. Much more attention needs to be paid to the keys to successful organizations and the scale or scope at which they cease being effective.

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