

The Potential for Small Holder Fruit and Vegetable Production in Mexico: Barriers and Opportunities

presented at the XIX International Congress/Latin American Studies Association (LASA), Washington DC, September 1995 and the Research Workshop of the Ejido Reform Research Project, University of California, San Diego, August 1995

Robin R. Marsh and David Runsten*

October 1995

* The authors are economists at the UCLA North American Integration and Development Center. Research for this paper was carried out with the financial support of the UCSD Center for U.S.-Mexican Studies' Ejido Reform Research Project, the Bank of America Foundation, and the Kellogg Foundation, and the Ford Foundation. The authors would like to express their appreciation for this support.

Abstract

The Mexican Government's (GOM) agricultural modernization plan favors less land area in basic grains and more resources invested in higher value crops, particularly fruits and vegetables. Data from the 1990 and 1994 SARH/CEPAL and SRA/CEPAL *ejidal* surveys indicate that more than 350,000 *ejidatarios* grow fruits and vegetables, and there is agronomic and market potential for further expansion. Such diversification or intensification, however, entail overcoming a difficult policy environment. We argue that, despite stated GOM support for diversification, "push" factors - out of maize - have not been accompanied by adequate "pull" factors into alternative crops.

Ten cases of participation by *ejidal* small-holders in fruit and vegetable production were studied, in nine states. The cases reveal the principal factors, both barriers and opportunities, facing Mexican *ejidatarios* as they attempt to shift to higher value crops: marketing, undercapitalization, technology and extension, transaction costs, labor migration and costs, and cultural factors. The barriers, placed in the context of the current policy environment, suggest a generally unfavorable environment for small-holder participation in fruits and vegetables. At the same time, opportunities for overcoming some of these barriers are noted and included in a simple step-by-step model for enhancing participation of *ejidal* producers in fruits and vegetables.

INTRODUCTION

Since the announcement by the Government of Mexico (GOM) of its *Programa Nacional de Modernización del Campo, 1990-1994* in 1990, and particularly since Mexico entered NAFTA, the stated agricultural strategy has been to promote the diversification of agricultural production from basic grains to higher value crops, especially fruits and vegetables. The justification hinges on the GOM intention for inefficient grain producers, under world market prices, to become efficient through "technification" or by shifting into alternative crops that better utilize their resources, and, otherwise, to leave agriculture altogether.

In this paper we address the *ejidal* sector (which is not likely to disappear any time soon despite Article 27 reforms¹), and its potential for diversification into fruit and vegetable production. We are particularly interested in participation by small-holder *ejidal* producers, who, make up the majority of agricultural producers in Mexico and occupy over 50% of total irrigated acreage.

There are several hundred thousand *ejidal* producers currently growing fruits and vegetables, most of them on a small-scale, and there is potential for many of these producers to expand and diversify further. There is also potential for *ejidal* grain producers with good quality land and access to water to shift, at least partially, into fruits and vegetables. Such diversification or intensification, however, entail overcoming a difficult policy environment. We argue that, despite stated GOM support for diversification, "push" factors - out of maize - have not been accompanied by adequate "pull" factors into alternative crops.

Research for this paper was conducted using a case study methodology. Our intention has been to identify actual examples of participation by *ejidal* small holders in fruit and vegetable production, and analyze the range of conditions that have led to their relative success or failure. Case selection was based in part on the authors' past field research relationships with particular fruit and vegetable firms or producer organizations. Diversity in geographic location, crops produced and institutional arrangements (i.e. partners, financing, marketing) was also considered important for formulating generalizable concepts from the cases. Informal interviews and field visits were centered around a set of pre-designed research questions; formal interviews were not administered.

Ten case studies were carried out in nine states. Some cases are examples of recent farmer diversification from basic grains to higher value crops (e.g. blackberry and potatoes in Michoacán, peaches in Puebla, vegetable production in the Yucatán), while in others fruit and vegetable production is established practice, but under changed conditions in recent years (strawberries in Irapuato, broccoli in Guanajuato, citrus in the Yucatán). Table 1 lists the case studies with brief information on basic characteristics. Separate reports on most cases are being prepared and will be available to consult for detailed information.²

¹As of mid-1995, the only official sale of *ejidal* land to the private sector, of which we are aware, has been the sale of 1,600 ha in San Quintín to the Canelos family.

²Please consult the authors for access to these reports.

Table 1: Summary Characteristics of Case Studies

CASES	STATE	MIGRATION AREA	DISTANCE TO PAVED RD (aver.)	PARTNERS		SOURCES OF FUNDING	
				US	Mexican		
DEL CABO COOP.	Baja California Sur	no	0.5 km	√		U.S. partner, U.S. bank self-financing	oi to ve bi
LA HUERTA	Aguascalientes Zacatecas	high	0.2 km		√	processing plant	bi
VALLE DE SANTIAGO	Guanajuato	high	0.5 km	√		U.S. buyer, migration remittances, self-financing	fr
a. fresh broccoli							
b. frozen broccoli	Guanajuato	high	0.5 km		√	processing plant, migration remittance, self-financing	fr
c. pickles	Guanajuato	high	0.5 km	√	√	same as above	pi
IRAPUATO STRAWBERRY COOP.	Guanajuato	low	1.0 km	√		U.S. buyer self-financing	st
MAYA FRUT/ JALAPENOS DEL CARIBE	Quintana Roo	no (except Cancún)	3.0 km		√	FIRA/commercial banks fresh shipper processing plant	cl ja
YUCATAN (Akil)	Yucatán	no	variable		√	Gov. of Mexico Banco Int'l, BANRURAL self-financing	oi
a. citrus							
b. local vegetable prod.	Yucatán	no	on the road		none	Gov. of Yucatán self-financing	tc ci
UNION DE CREDITO PUEBLA : peaches "Acajete"	Puebla Estado de México	low	3 km		none	unión de crédito/ BANRURAL, self-financing (petition in for SEDESOL \$)	pi ir
UNION DE CREDITO PATZCUARO: potatoes	Michoacán	high	7 km		none	UC/BANRURAL/FIRA self-financing	pi (t ir
MICHOACAN: blackberries	Michoacán	high	variable	√	√	UC/BANRURAL/commercial banks/FIRA, SEDESOL remittances, self-financing	bi (z

Table 1 (cont).

CASES	TECHNICAL ASSISTANCE	EST. COST. OF PROD/ha. (1995)	TYPE OF ORGANIZATION	MARKETS	
				Local/ national/exports	None
DEL CABO COOP.	U.S. partners, Mexican hired agronomists	no info. for 1995	SSS (Sociedad de Solidaridad Social)	export	
LA HUERTA	processing plant agronomists	NM 9,000.00	none	local, national, export	
VALLE DE SANTIAGO	U.S. buyers	NM 13,000.00	contract farming	export	
a. fresh broccoli					
b. frozen broccoli	processing plant agronomists	NM 9,000.00	contract farming	export	
c. pickles	same as above	no info.	contract farming	national, export	
IRAPUATO STRAWBERRY COOP.	U.S. buyers (in the past) traditional knowledge	NM 15-20,000.00	cooperative (formerly under CNPH control)	export	
MAYA FRUT/ JALAPENOS DEL CARIBE	shipper hired agronomist/ focus on IPM	NM 5,000.00 (trad.) NM 14,000 (full technology)	Asociación en Participación	local (fresh), national (processed), export (fresh & processed)	
YUCATAN (Akil)	Plan Chac, Gov. of Mexico, SARH (in the past)	NM 3,000.00 (non-bearing), NM 5,000 (bearing)	Unión de Ejidos	export (frozen juice)	
a. citrus					
b. local vegetable prod.	Technical University (Yucatán), State gov.	no info.	none	local (all fresh)	√
UNION DE CREDITO PUEBLA : peaches "Acajete"	SINAPROM, S.A. (tech. assistance agency ass. with UC Puebla)	NM 19,000 (establishment + 1 st year management)	SSS (some also members of UC Puebla)	local, national	√
UNION DE CREDITO PATZCUARO: potatoes	UC agronomists large potato farmer/input vender	NM 10,000 (local var.), NM 14,000 (improved var.)	failed effort to form asos. en part., some members of UC Patz.	local	√
MICHOACAN: blackberries	U.S. buyers/Mexican distributors nurseries in Uruapan	NM 40-70,000.00 (establishment through 1st harvest)	some members of UC Pátzcuaro	local (fresh), export (fresh & processed)	

The chapter is divided into five sections. Section II presents a brief overview of the Mexican fruit and vegetable sector and provides preliminary figures on *ejido* participation in this sector from the SARH/CEPAL 1990 and SRA/CEPAL 1994 surveys. Section III briefly reviews the current policy environment for diversification by small-holders. Section IV analyzes the principal barriers and opportunities for diversification into fruits and vegetables facing *ejidatarios*, exemplified with information from the ten case studies. In the last section, we conclude with one possible model of how to overcome barriers for small-holder participation in fruits and vegetables.

OVERVIEW OF MEXICAN FRUIT AND VEGETABLE PRODUCTION AND EJIDO SECTOR PARTICIPATION

Existing data on the agricultural sector in general in Mexico are scarce and often conflicting, making it difficult to provide reliable estimates of even such basic facts as hectares of total cropland, rainfed and irrigated, and numbers of producers, private and ejidal. This situation becomes far worse in the case of fruit and vegetable production. Nevertheless, in this section available data are used to make some preliminary statements about ejidal participation in fruit and vegetable production.

According to the Cook et al study on NAFTA, Mexico plants about 700,000 hectares to fruits and vegetables annually or 2.5% of its total agricultural land (1991)³. However, Gómez Cruz (1994), using SARH data, estimate that in 1991, 550,000 hectares were planted in *hortalizas*, including all vegetables but only watermelon, cantaloupe and strawberries among fruits.⁴ Since in Mexico significantly more hectares are planted in fruit orchards than in vegetables, the Cook estimate is probably low. The real number may well exceed one million hectares, so that between 3.5 and 4.0% of total agricultural land is in fruits and vegetables.

The value of production contributed by fruits and vegetables is far greater than its land proportion, however actual value estimates are hard to find. Figures from Gómez Cruz (1994), using BANCOMEX data, put the value of *hortaliza* production at 14.3% of the total value of Mexican agricultural production in 1991.

About 80% of fruits and vegetables produced in Mexico are sold in domestic markets, and the remaining 20% are exported (Benito 1990, USDA/ERS 1995). Since home garden or *traspatio* production is not included in these figures, the proportion consumed domestically is even higher. Nevertheless, fruit and vegetable exports have been growing steadily over the last decade, and in 1994 equaled nearly 54% of total agricultural export value to the United States, by far the main market for Mexico. In 1994, the value of horticultural exports to the U.S. was \$1,541 million, 73% in vegetables and 27% in fruits (USDA/ERS:NAFTA 1995). Mexico also imports fruits and vegetables, principally from the U.S. (61%) and Argentina and Chile (17%) (USDA/ERS 1992).

Cook et al, using CNPH figures, suggest that 20% of the Mexican agricultural labor force are involved directly or indirectly in fruit and vegetable production. According to Gómez Cruz et al (1991), only 22,000 producers (0.5%) participate in the export sector, including all crops, out of a total of 4.5

³Estimates of agricultural land area in Mexico vary widely depending upon source and definition. Cook et al offer an estimate of 27.1 million ha, Gómez Cruz et al give 31.7 million ha.

⁴ By tradition, Mexico includes non-orchard fruits in its figures on vegetables or “*hortalizas*”, whereas in the United States all fruits are categorized together separately from vegetables.

million agricultural producers in Mexico. Therefore, the vast majority of fruit and vegetable producers in Mexico produce for the domestic market and most are small-scale producers.

The 1990 SARH/CEPAL nationwide survey⁵ of approximately 35,000 ejidatarios in 5,000 ejidos from 193 *Distritos de Desarrollo Rural* (DDR) together with the 1994 SRA/CEPAL survey⁶ of a subset of 1,548 ejidatarios in 275 ejidos, offer the most reliable data currently available on ejidal sector participation by agricultural activity, including fruits and vegetables. The surveys permit extrapolation from the survey sample to the entire ejidal sector, using the appropriate expansion factors, and, for a subset of the same ejidos, inter-temporal (1990-1994) comparisons over a wide range of variables. Some results from the survey are presented in Tables 2 and 3.

There are about 2.6 million ejidatarios in Mexico that farm individual parcels, not including those that habitually rent their land. They farm approximately 15 million hectares of land; 11.7 million ha, or 78%, rainfed and 3.3 million ha, or 22%, irrigated (SARH 1992a). As shown in Table 2⁷, an estimated 4.2% and 2.6% of total ejidal cultivated land was in fruits and vegetables in 1990, respectively, corresponding to an estimated 20% of irrigated land (see table footnote 2). The majority of irrigated land is still in maize, beans and other grains.

Fruit and vegetable production is widespread throughout the ejidal sector, as shown by the large number of DDRs where fruits and vegetables are grown, 79% and 85% of all DDRs surveyed in 1990, respectively. This is confirmed from the data in Table 3, showing surveyed fruit and vegetable producers by state (except Chiapas and D.F.). Of a total of 26,091 ejidatarios surveyed, 4,003 or 15% had land in fruits or vegetables. When this percentage is applied to all ejidal producers with 10 hectares or less (a plausible cut off point for small and medium holders), the national total comes to slightly over 320,000 producers. This figure corresponds well with the total figure for fruit and vegetable producers in Table 2, 382,000, which includes all farm sizes and states.

Fruit and vegetable producers by state as a proportion of all ejidatarios surveyed, range from a high of 60% in Baja California Sur to a low of about 5% in Coahuila, Hidalgo and Tlaxcala, with a weighted average of 15%. The five states with the largest number of surveyed fruit and vegetable producers are: Veracruz, Oaxaca, Michoacán, Yucatán and San Luis Potosí. The last two columns of Table 3 show surveyed land area in fruits and vegetables for all seasons (fall/winter, spring/summer, perennial), classified as irrigated and rainfed. Notable is the large proportion of fruits and vegetables grown under rainfed conditions, about 40% overall, concentrated in the southern and southeastern states, in addition to orchards in Durango, Zacatecas and Nuevo León.

⁵ SARH : Proyecto Tipología de Productores del Agro Nacional. Cuestionario para obtener información de las unidades de producción individuales del sector social, 1990.

⁶SRA-CEPAL, Mexico, UC Berkeley. El Sector Ejidal en la Agricultura Mexicana: Impacto de las Reformas, 1990-94, 1994. Data not yet available to the public.

⁷ *Traspatio* fruit and vegetable production is not included. In other words, these figures refer to ejidal producers who are involved in commercial fruit and vegetable production, for domestic markets or export.

Table 2: Fruits and Vegetables in the Ejidal Sector

	Fruits			Vegetab	
	Figures on fruits	% of sector	% of irrigated sector	Figures on vegetables	% of sector
# of DDRs	151	79.0	n.a.	162	85.0
Production (1,000 mt)	3,600	n.a.	n.a.	2,400 ¹	n.a.
Area (ha)	625,000	4.2	18.9 ²	384,000 ³	2.6
Producers (#)	202,000	8.2	31.7 ⁴	182,000	7.0
Average cultivated area (ha)	2.5			1.7	
Average yields	63% of national average			57% of national average	

Source: This table was created using data from the Proyecto SARH/CEPAL documents: *Clasificación y Grados de Diversificación de los por Cultivo*, Julio de 1992, and *Primer Informe Nacional sobre Tipología de Productores del Sector Social*, Tercera versión, Junio de 1990, came from the SARH/CEPAL Survey, 1990.

- 1 According to SARH data (Gómez Cruz 1994), in 1991 total Mexican production of "hortalizas" was 8,501 thousand mt, so the data above, approximately 28% was produced by the ejidal sector.
- 2 Fruits and vegetables are grown on rainfed land as well, so these figures are on the high side. If only 70% of fruits were produced on irrigated land, the figure would decrease to 13.3%; if only 80% of vegetables were produced on irrigated land, the figure would decrease to 9.3%.
- 3 According to SARH data (Gómez Cruz 1994), in 1991 total Mexican cropland in "hortalizas" was 550,000 ha, so that, from above, approximately 70% is grown on ejidal land.
- 4 See note 2. If only 70% of producers of fruits and 80% of producers of vegetables had irrigated land, the figures in both categories would decrease.

Table 3: Preliminary data on fruit and vegetable producers and area by state: 1990 SARH/CEPAI

<i>State</i>	<i>all ejido producers < 10 ha {a}⁸</i>	<i>ejido survey all {b}</i>	<i>ejido survey f & v {c}</i>	<i>proportion f & v producers {c/b}</i>	<i>estimated f&v producers, all {c/b x a}</i>	<i>c/b in descending order by state</i>	<i>irrigated ha (sea)</i>
Aguascalientes	12,905	129	33	0.26	3,301	B.C. Sur	
Baja California	6,899	96	29	0.30	2,084	Colima	
B.C. Sur	1,749	116	70	0.60	1,055	Yucatan	1
Campeche	19,370	613	104	0.17	3,286	Quintana Roo	
Chihuahua	55,654	1,220	117	0.10	5,337	Baja California	
Coahuila	42,477	410	19	0.05	1,968	Nayarit	
Colima	7,394	160	78	0.49	3,605	Aguascalientes	1
Durango	55,889	712	40	0.06	3,140	Veracruz	
Guanajuato	79,044	519	42	0.08	6,397	San Luis Potosi	
Guerrero	130,521	1,370	236	0.17	22,484	Tabasco	1
Hidalgo	117,407	1,086	58	0.05	6,270	Michoacan	
Jalisco	86,844	1,033	69	0.07	5,801	Puebla	
Est. de Mexico	194,397	2,011	143	0.07	13,823	Morelos	1
Michoacan	120,621	1,670	330	0.20	23,835	Guerrero	3
Morelos	29,599	133	24	0.18	5,341	Campeche	
Nayarit	42,987	527	157	0.30	12,806	Oaxaca	
Nuevo Leon	27,353	367	37	0.10	2,758	Sonora	
Oaxaca	285,047	3,230	444	0.14	39,183	Zacatecas	3
Puebla	143,650	1,416	257	0.18	26,072	Nuevo Leon	2
Queretaro	30,553	593	55	0.09	2,834	Chihuahua	
Quintana Roo	23,313	549	187	0.34	7,941	Queretaro	
San Luis Potosi	105,871	1,332	296	0.22	23,527	Guanajuato	2
Sinaloa	79,959	769	51	0.07	5,303	C. Lagunera	
Sonora	18,376	577	65	0.11	2,070	Est. de Mexico	1
Tabasco	38,602	505	100	0.20	7,644	Tamaulipas	
Tamaulipas	37,880	751	53	0.07	2,673	Jalisco	
Tlaxcala	34,640	445	24	0.05	1,868	Sinaloa	
Veracruz	195,073	1,899	462	0.24	47,459	Durango	2
Yucatan	49,350	781	319	0.41	20,157	Tlaxcala	3
Zacatecas	70,545	772	82	0.11	7,493	Hidalgo	
C. Lagunera	38,363	300	22	0.07	2,813	Coahuila	
Total	2,182,332	26,091	4,003	0.15⁹	320,330		3,3

⁸ From the *Encuesta Tipología de Productores del Agro Nacional*, SARH/CEPAL 1990 Ejido Survey: total ejido producers with farm size 10

⁹ Weighted average.



Preliminary figures from the 1994 survey show a significant increase in numbers of small holders (less than 5 ha of rainfed equivalent land - ETN) cultivating fruits and vegetables over 1990, from 8.6% to 14.2%, while numbers of producers with more than 5 ha ETN remained about the same at 20% (*Cuadros 4.3, 4.4, p. 4.7, 4.9*). 1994 data also show that 75% of ejidal families engage in traspatio activities, including horticulture, primarily for home consumption.

Recalling the estimate given by Gómez Cruz on total agricultural land in hortalizas¹⁰ in 1991, 550,000 hectares, it would appear that ejido participation is very high, about 70% (Table 2). However, in terms of volume of production, the share is much lower. Taking the SARH figure of 8,501 thousand metric tons of vegetables produced in 1991, the contribution by the ejidal sector was about 28% in that year (2,400 thousand mt.). From this information we conclude that, although fruit and vegetable yields vary widely by crop and region, on average, ejidatario yields are significantly below private sector and national average yields. This is confirmed by the yield data presented in Table 2, showing that ejido average yields were just 63% and 57% of national average yields for fruits and vegetables, respectively. The reasons for this disparity are explored throughout this paper.

GOM POLICIES AFFECTING DIVERSIFICATION INTO FRUITS AND VEGETABLES

The GOM has a stated objective, tied to the liberalization of the economy and free trade agreements, that favors transition from basic grains to higher value crops, particularly fruits and vegetables. Yet, specific policies implemented over the last decade, and especially since 1990, have had greater push effects (out of maize) than pull effects (into higher value crops). This is especially true for small-scale fruit and vegetable production.

The government deregulated the domestic trucking industry in 1989 and removed control of export permits from the Confederación Nacional de Productores de Frutas y Hortalizas (CNPH) in 1990. Both of these policy changes favor the entry of new fruit and vegetable producers. However, the government also eliminated free extension services, except for certain special programs, and cut back on agricultural research. The "loss" of government sponsored agricultural research and extension is not keenly felt because there was never an emphasis on fruit and vegetable production. However, the privatization of extension disproportionately hurts small producers who are less able to pay. And cutting back funds for agricultural research puts Mexico at a serious disadvantage for maintaining a competitive edge with the United States.

The government has also attempted to eliminate input subsidies to agriculture by selling off parastatal firms and raising prices in those that remain (e.g. fertilizer and electricity) toward world prices. Since many fruits and vegetables in Mexico are grown with pumped ground water, higher electricity rates and falling water tables are raising the cost of water. Rather than attempt to control quantities pumped, the strategy appears to be to raise the cost of pumping until the water table stabilizes, i.e. enough people stop pumping. While this may encourage diversification into higher-value crops in these regions, the high costs will discourage small producer participation.

An alternative source of water would be the surface irrigation districts, covering 3.3 million hectares. However, most of the districts are not equipped to handle significant fruit and vegetable production. They are too large to meet the precise irrigation needs for short-cycle vegetable crops, and

¹⁰We have no similar data for total area and production of fruits.

supplementary rainfall is uncertain. The transfer of irrigation districts to users has led to more efficient operation, but on the whole they remain undercapitalized and in need of major structural improvements.

Another set of policies has involved the opening of the Mexican economy through trade agreements, notably NAFTA. In an open economy, at world prices, much of grain and oilseed production in Mexico is thought to be unprofitable. In response to this eventuality, the government has offered PROCAMPO. As initially conceived, PROCAMPO was meant to decouple producer subsidies from commodity prices, with payments per hectare fixed in real terms for 10 years, then phased out over 5 years. All land that had been growing grains and oilseeds in one of the years between 1991 and 1993 was to be eligible. One of the principal arguments for decoupling was the need to shift cropping patterns from grains, unable to compete at world prices, to more remunerative crops.¹¹

In practice, two years into PROCAMPO, producers are still being required to demonstrate they are growing one of the basic program crops, because of the difficulties the Secretariat of Agriculture has had verifying eligible producers. In addition, the amount of money paid per hectare has not been kept constant in real terms, rising from 350 pesos/hectare in 1994 to 440 pesos/hectare in 1995, an increase of 25.7 percent when inflation in 1995 is projected at 50 percent, and the price of fertilizer increased more than 100 percent between the 1994 and 1995 spring-summer seasons. In any case, these are small amounts of money for small producers who might want to convert to fruits and vegetables. If used at all for production, our interviews indicate that PROCAMPO checks have gone to buy fertilizer for maize.

Finally, there have been very important changes in macroeconomic policies, especially exchange rates and interest rates, that have had a significant impact on agriculture. Even before the devaluation at the end of 1994, the government was maintaining relatively high interest rates to attract foreign capital, almost twice the real rate of interest prevailing in the United States and Canada. Agricultural producers interviewed were paying over 20 percent interest in 1994 on dollar loans in Mexico. This situation had led to high default rates, to the formation of the Barzón lobby to pressure the government to restructure agricultural debt, and to little investment in Mexican agriculture. Small producers' access to formal credit has been denied because of unpaid debts or collateral requirements beyond their means. In addition, the overvalued peso was limiting the profitability of investment in Mexican export agriculture.

The devaluation has set off an even greater crisis, as spiraling interest rates since January 1995 made it impossible for many producers to repay loans, and those who did repay would not borrow again at these high rates (CETES peaked at 71% in May 1995). In mid-1995, programs such as FIRA¹² that were supposed to be developing the new Mexican agriculture are instead completely consumed in restructuring debt. The devaluation revives the possibility of expanding export fruit and vegetable production, but this will have to be financed in dollars in the near term, and small producers rarely have access to such sources of funds.

Apart from FIRA, the government actors in the countryside that have supported ejidatarios' and *comuneros'* efforts to diversify and gain control over the marketing of their products have been *Solidaridad* (SEDESOL) and the Instituto Nacional Indigenista (INI). Unfortunately, many of these efforts have been

¹¹"...ha sido creado PROCAMPO con los siguientes objetivos: ...Fomentar la reconversión de aquellas superficies en las que sea posible establecer actividades que tengan una mayor rentabilidad." SARH, PROCAMPO pamphlet, 1993, p.21.

¹² Fideicomisos Instituidos en Relación con la Agricultura en el Banco de México.

characterized by a continuing political paternalism and a significant degree of corruption¹³. Such experiences confirm that government programs are not the best vehicle for promoting small producer participation in fruits and vegetables.

In sum, Mexican government policies, in particular, liberalization of grain prices and elimination of input subsidies, have provided a large push for small-holders to shift acreage out of grains. Unfortunately, favorable pull factors for diversifying into higher value crops such as fruits and vegetables are wanting: little research on fruits and vegetables, very limited extension, high input prices, serious credit constraints, and few "honest" actors promoting such change.

BARRIERS AND OPPORTUNITIES FOR SMALL PRODUCER PARTICIPATION IN DIVERSIFICATION

Information gathered from the ten case studies listed in Table 1 was analyzed to identify the leading barriers and opportunities for small-holder participation in diversification discussed in this section. Examples from the cases are given, subject to space limitations. Barriers and opportunities are grouped under principal themes: marketing, undercapitalization, technology and extension, transaction costs, labor migration and costs, and cultural factors. The barriers, placed in the context of the policy environment described in the previous section, suggest a generally unfavorable environment for small-holder participation in fruits and vegetables. However, we note important opportunities for overcoming some of these barriers in the medium to long-run.

Marketing

Many of the problems that small producers face in a transition to fruit and vegetable production lie in the marketing system. Ejidatarios repeatedly demonstrate that they can learn to produce such crops, but can they sell them at a profitable price? Unfortunately, efforts by the Mexican government to assist small producers have been largely confined to the sphere of production. In fact, for decades the expansion of fruit production has been subsidized with almost no attention to marketing.¹⁴ Recently, institutions such as FIRA, INI and SEDESOL have supported the formation of marketing cooperatives, an effort that must be vastly expanded, as the following discussion of marketing problems will demonstrate.

Lack of regulation and recourse in transactions.

There are many examples of opportunistic behavior by intermediaries in fresh fruit and vegetable marketing, and this is as true of brokers in U.S. markets as it is of Mexican intermediaries. Small producers far from markets, without a truck, are dependent on intermediaries to purchase their crop *a pie de la huerta*. Oranges in Veracruz, avocados in Michoacán, carrots in the Bajío, and chilies in many regions are all examples of crops where such intermediation is dominant. Although this type of marketing can be convenient for small producers, it leaves them vulnerable to low prices or, in the case of sales "on credit," to not getting paid at all. Ejidatarios in Ciudad Obregón, Sonora, showed us checks from U.S. brokers for vegetables that could not be cashed. A Miami melon broker was in jail for issuing worthless

¹³From case studies we have examined and personal interviews with INI and SEDESOL staff in Mexico.

¹⁴For a discussion of this problem 20 years ago, see Anson (1977).

checks in Felipe Carrillo Puerto, Quintana Roo, in 1994. Small and medium-scale blackberry producers in Michoacán were "stiffed" in 1995 by a Mexican distributor of a U.S. fruit firm that left town.

The lack of an effective legal system of recourse in such transactions in Mexico, such as the Uniform Business Code and the Perishable Agricultural Commodities Act in the United States, leads to mistrust and opportunistic behavior on both sides. Mexican growers at times take advances from intermediaries but spend them on unrelated goods, or take advances from one buyer and then sell to another. If small producers are to succeed in fruits and vegetables, more formal advance and payment arrangements need to become the norm.

Lack of sufficient capital to wait for payment.

Many produce sales allow 30 days for payment, especially sales to supermarkets, hotels, or for export. Small producers have a limited capacity to await payment, needing the money to live and pay debts. Thus, they prefer intermediaries who can pay upon delivery, even at a low price. For example, one of the biggest obstacles to small producers selling to resort hotels in places such as Cancún is that current wholesalers are extending large amounts of credit. Contract farming usually offers prompt payment on delivery. The Del Cabo cooperative in Baja California Sur raised sufficient operating capital so that producers can be paid within a week of delivery, even though the organization has to wait a month or more for payment by U.S. buyers.

Lack of transport and volume.

Most small producers lack trucks of sufficient size to transport products to wholesale markets, and they lack the volume individually to justify purchasing such a truck. This single fact gives rise to most local intermediation. In Yucatan, as in many areas, indigenous fruit producers bring small quantities of produce in "taxis" to local markets, where they are sold to intermediaries with trucks. The profitability of such intermediation varies greatly, as the intermediary faces perishability and market price risks. Nevertheless, our studies of price differentials indicate that "truck farming," where producers are able individually or through organization to deliver their produce directly to wholesale markets on a regular basis, holds the most immediate promise for raising producer incomes. Prices are generally two to three times higher if producers can truck their produce directly.

Different qualities for different markets require grading and packing.

Typically, small producers mix together produce of different size, maturity, and quality because of small volumes. The convention is to pay the price for the worst produce in the bunch. As a result, ejidatarios do not receive the total revenue their produce warrants, and intermediaries capture this revenue through their own grading and selection efforts.

A group of honey producers in Champotón, Campeche, who formed a cooperative with the assistance of INI, built a warehouse with Solidaridad that included only one tank for honey. Only when they began to negotiate with German buyers did they become aware that there are a range of prices for different grades of honey, so that it was necessary to grade and separate the honey into different storage tanks. A similar marketing revolution is occurring in Mexican coffee production, where producers are discovering that coffee grown in particular micro-climates above certain elevations or using organic techniques can be sold at much higher prices in international markets. By joining together to grade, sort, and pack their produce, giving a better "presentation" to their product, ejidal fruit and vegetable producers can realize much higher prices than they currently receive.

Small producer yields prevent full access to dual fresh/processed markets.

In many fruit crops, produce that cannot be profitably sold on the fresh market is diverted to processing to increase aggregate income. The California strawberry industry is a paradigm case of how this can be done successfully (Runsten 1987). In Mexico, many processing plants have been created by ejidatarios without understanding such relationships, and have therefore failed. In Irapuato, a cooperative of ejidatarios was formed to freeze strawberries for export, but failed because insufficient product was available for freezing after producers sold on the fresh market. In Akil, Yucatan, a citrus concentrate plant with 6,000 ejidal associates cannot obtain sufficient raw product, again because of low yields and higher prices on the fresh market. In such cases, small producers do not invest sufficient capital to achieve yields that would make dual market outlets feasible.

Lack of information about market supply, opportunities and prices.

Probably the greatest problem for ejidal fruit and vegetable production is the lack of information about market opportunities due to the sale of most produce to intermediaries. Since these producers have no experience with how markets really function, they do not understand the premiums paid for quality differentiation and attractive presentation. Mexican produce markets are in the midst of an enormous transformation, as increasing amounts of produce are sold directly to supermarkets, and with increasing competition from U.S. and Chilean imports. Small producers will have difficulty participating in this evolving system unless they have access to adequate information, and unless they organize to sell through marketing cooperatives.

In recent years, Mexico has made more of an effort to provide daily wholesale price information in the produce industry through the Sistema Nacional de Información de Mercados (SNIM). However, while this information is usually faxed to wholesalers and large buyers, and is available through subscription TV information services, little or no effort is made to disseminate it to producers. Most ejidatarios do not even know it exists. Mexico also lacks timely information on acreage planted, so producers are unable to estimate changes in supply and demand, leading to excessive seasonal swings in both supply and prices. All producers suffer from this information deficit.

Small producers need to organize to reduce market risk.

There are scale advantages in fresh fruit and vegetable production, as larger producers (or groups of producers) can often negotiate better prices or can be in the market more days of the year, thereby reducing their vulnerability to price fluctuations. They also have established contacts with wholesalers in Mexico's largest markets, while small producers have difficulty breaking into these markets.

Contracting of ejidatarios to produce fruits and vegetables for processing provides an alternative that reduces market risk. Most of these contracts are at fixed prices, since processed food markets are less variable. Thus, the risks faced by producers are basically production risks related to climate and pest problems.

Scale advantages in marketing are especially important in export markets. The same problems of opportunism exist with U.S. brokers as with Mexican intermediaries, and the small producer by himself has little defense against such risks. In fact, producers of all sizes in Mexico complain bitterly of broken promises, failed payments, and unfairly rejected produce by U.S. brokers. The brokerage system can be improved through public policy, but greater scale achieved through cooperation among producers will also

provide the needed countervailing power. Finding honest and attentive marketing agents is difficult but of paramount importance.

Undercapitalization

Most ejidatarios and *minifundistas* are badly undercapitalized, as are most small businesses everywhere in the world. This undercapitalization presents a major barrier for transition from basic grains to higher value crops. For instance, in mid-1995 maize cost N\$2,500 or less per hectare, while broccoli cost N\$9,000, potatoes N\$14,000, strawberries N\$30,000 and the estimated cost of establishing a blackberry orchard was N\$40,000 to 70,000 per hectare. The costs for ejidatarios may be less because of reliance on family labor, less intensive planting and lower use of inputs than recommended, but often with negative yield and quality outcomes. To shift from maize to more intensive crops therefore requires a major leap in financing.

Limited credit availability.

As a result of the higher costs involved in growing fruits and vegetables, access to credit is often essential. Yet, in Mexico today, sources of credit for small farmers are extremely limited. BANRURAL requires collateral equal to 1.5 to 2 times the value of the loan. Agricultural machinery, vehicles and private property may be accepted as collateral, but not ejidal houses or land certificates, putting these producers at a distinct disadvantage. Private banks have similar collateral requirements and are reluctant to lend to the agricultural sector period, let alone the ejidal sector. However, opportunities exist with FIRA incentives.

FIRA incentives open the door for private financing¹⁵.

While the proportion of agricultural credit provided through BANRURAL has markedly decreased since 1988 (declining to 8.7% by 1993), credit loaned via FIRA has held steady, at about 20% (Myhre 1995). Through its guarantee program, FEGA, FIRA will pay up to 80% of the value of the required guarantee at a minimal cost to the borrower, for those borrowers qualifying as "producers in development" (<3,000 daily minimum wages). FIRA also offers interest rate discounts equal to the CETES rate for these producers, and equal to CETES + 4 for "developed producers". In 1994, FIRA discounted about 1 billion dollars of loans for low income producers, 90% with private banks. In 1995, FIRA is active working with banks to restructure defaulted loans of producers caught by the post-devaluation escalation in interest rates. There has been little demand for new loans at these rates.

Credit unions are an option for the ejidal sector.

Even with FIRA discounts, private banks are reluctant to manage loans to the small farm sector. They are more inclined to approve loans to credit unions that represent large numbers of producers and will assume the responsibility for managing these loans. In effect the Unions act as financial intermediaries, channeling subsidized credit and guarantees to their low income members through FIRA and the banks. There are about 380 CUs in Mexico, 160 serve agriculture, and of these, 35 serve the ejidal sector, with approximately 27,000 members. All were established since 1986 (Cruz Hernández, 1995).

The Union de Crédito Mixto "Plan Puebla" (UCP), for instance, was established in March 1993 in direct response to farmer demands, and now has 2,500 members in the State of Puebla. Though most of its

¹⁵ The national development bank, NAFIN, also serves as a second tier bank for guaranteeing development loans, covering all sectors of the economy.

members are small maize producers by origin, approximately 70 percent of money loaned is for non-agricultural projects, as farmer members seek to diversify household income. Only a small amount of money has gone toward fruit and vegetable projects, but these types of loans are increasing in response to farmer interest. The UCP has been able to withstand the post-devaluation crisis because of its diverse loan portfolio, varied sources of funding, and economic and political power that have come into play for restructuring loans with the banks.

Other sources of funding are becoming more prevalent.

As a result of limited credit availability, and especially since the steep rise in interest rates in 1995, small farmers are relying more and more on other sources of funding for both traditional crops and the financing of alternative higher-value crops. Such sources include: SEDESOL no-interest loans and investments (with very high default rates); advances made by buyers to cover a portion of production costs (market-linked credit); advances made by contractors (processors, large producers); PROCAMPO payments to a limited extent; informal lending at very high rates of interest (10-20%/month); and, perhaps most importantly, self-financing through retained earnings, migration remittances and family money.

Strawberries in Irapuato are typically self-financed, as are the water and labor costs of the Del Cabo vegetable growers in Baja California Sur. Savings from remittances along with retained earnings from avocado and peach operations have financed new blackberry plantings in Michoacán. Many ejidatarios in the broccoli and cauliflower contracts use migrant earnings to self-finance their portion of operating costs. Such cases of self-financed transition to higher value crops are common throughout Mexico, and represent an alternative to indebtedness and associated risks. There is a danger, however, that reliance on self-financing will maintain the producer at an undercapitalized level of investment, leading to deteriorating yields and quality and difficulties competing in the larger markets.

Technology and Extension

Ejidatarios who have only produced grains and want to diversify into fruits and vegetables to obtain higher incomes, have likely had little or no experience in production of these crops, except perhaps at the traspatio level. Large producers hire professional experts to advise them, but small producers generally lack the funds or scale for contracting technical assistance on an individual level. Moreover, even when the producer is willing to pay for such assistance, there is a notable lack of Mexican agronomists skilled in fruit and vegetable production.

Production for domestic markets, especially village and regional markets, may not require the same quality standards as export production. However, this situation is rapidly changing as Mexico is flooded with imports from the United States and South America under new trade agreements. Furthermore, small fruit and vegetable producers from the center and south of Mexico face steep competition from the larger, generally more efficient producers in the northern states. To be successful, these small producers need intensive technical assistance, especially during the transition period from grains to alternative crops.

The government has cut back agricultural research and is out of extension.

The Secretariat of Agriculture no longer provides extension services, except for special programs. Their main contact with small farmers in recent years has been through processing and distribution of PROCAMPO payments. INIFAP continues to carry out agricultural research, with severely reduced budgets and personnel. There is still a bias in Mexican agricultural universities and INIFAP toward research on basic grains, however some efforts are underway to reduce the large deficit in fruit and

vegetable crop experts through auxiliary training, particularly in northwest Mexico and the United States. In general, these experts are quickly absorbed into large operations or become farmers themselves. Few are available to help small producers.

Move toward private technical assistance services.

Extension services have essentially been privatized through the establishment of technical assistance agencies, or *despachos*, throughout the country, run primarily by agronomists formerly employed by the government. These *despachos* have had varied success, less in the center and south of Mexico where farmers are poorer and not accustomed to pay for technical assistance. FIRA offers a program to approved *despachos* that reimburses small producers in decreasing proportions over five years of technical assistance (80% down to 0% in the fifth year). The purpose of this program is to "educate farmers to pay for their own technical assistance".¹⁶ However, this benefit is available only to producers operating with FIRA discounted credit.

The credit unions can also make use of the FIRA program through their independent technical assistance *despachos*. Such agencies in Puebla and Pátzcuaro retain the FIRA reimbursements in a reserve fund to ensure their solvency when producers are unable or unwilling to pay for technical assistance. However, the problem of lack of trained fruit and vegetable experts persists, and this deficit has contributed to the resistance of the UCP (and the banks) to fund high-value, high-risk crops. Nevertheless, in response to demands from members, there will be more credit for horticultural crops in the future, highlighting the need to contract specialists in these crops.

Appropriate technology for small producers in transition.

For ejidatarios to be competitive they may need to play to their strengths in labor intensive activities. Where family labor is available for fruit and vegetable cultivation, and its opportunity cost is below the going rural wage, such producers can enjoy a significant labor cost advantage over large producers. Furthermore, there is evidence that the quality of family labor may be superior to hired labor for certain tasks, such as the monitoring of water needs and pest populations, and specialized harvesting operations. Organic agriculture and reduced reliance on chemicals through integrated pest management (IPM) are labor intensive systems that can reduce costs and improve market potential and price, particularly for export.

The success of the Del Cabo cooperative of small-scale producers of organic vegetables and herbs for export, in cooperation with organic farmers from California, or groups of small coffee growers producing organic coffee, suggest important niche markets exist that can be accessed through an appropriate technological and marketing strategy. However, this type of strategy requires "strategic alliances" with partners able to impart this knowledge on a consistent basis. This has been the case of IPM extension provided by the processing firms to broccoli growers in the Bajío, and by Maya Fruit to chili producers in Yucatan and Quintana Roo, in this latter case using IPM technology from the Zamarana Agricultural University in Honduras.

Strive for medium-level technology.

A strong case can be made that small holders making the transition to fruits and vegetables, should strive for *medium level* technology (on a low to high continuum of increasing sophistication, capital intensity and

¹⁶ Interview with FIRA branch director in Puebla, Puebla.

risk). Remaining at a low technology level, whether organic or traditional, severely reduces the quantity and quality potential of the crop, e.g. unattended fruit orchards or underfertilized and underwatered annuals. Adding labor, management and whatever limited capital exists to enhance the productivity of these crops will pay off in improved production. However, starting out with sophisticated technology is generally too costly and too risky.

Transaction Costs

A significant barrier to participation by small producers in fruit and vegetable production is the costs incurred in dealing with them by other actors in the system. Since such costs are seldom quantified, many researchers have failed to take them into account in assessing price discrimination or other supposed biases against peasants.

Loans to small producers cost more.

For a bank to make many small loans, it must be able to charge higher rates of interest to cover higher per unit handling costs. The failure to do this in Mexico in large part led to the bankruptcy of BANRURAL and the great reduction in formal credit available to ejidatarios. The cost of credit to small borrowers in informal markets is usually orders of magnitude higher. As the phrase goes, "*No hay crédito más caro que crédito que no hay.*"¹⁷ For fruit and vegetable production to work, small growers will need to borrow money. The formation of credit unions can facilitate this, but to function properly they must be able to charge sufficiently to cover their costs.

Contracting with small producers costs more.

Similarly, some frozen vegetable processors in the Bajío have been reluctant to contract with small-scale ejidatarios because of the transaction costs. One processor who had decided to no longer work with small producers offered the following list of costs: more technical assistance needed (especially IPM), and no phones, requiring more trips to their fields; need to loan or rent to them specialized machinery such as rototillers or high-pressure sprayers; must advance them more inputs, tying up capital; monitoring for pesticide violations more important; smaller trucks coming to the plant mean more time to weigh and unload; and more producers under contract mean higher accounting and administrative costs. Nevertheless, the firms' need for broccoli and cauliflower producers often compelled them to devise schemes to include small producers.

La Huerta in Aguascalientes expanded its contracting with ejidatarios because large growers in that region were less willing to grow broccoli or cauliflower on a reliable basis. Also, the ejidatarios proved themselves to be good producers, having higher yields, perhaps 20 percent higher, than the firm's own ranches. The firm organized a cost-effective system of delivering technical assistance involving weekly visits by the firm's agronomist. Other firms have devised different types of contracts that attempt to recover some of the transaction costs associated with working with large numbers of ejidatarios, but find these difficult to implement when competing firms are willing to subsidize these costs.

Technical assistance for small producers costs more.

¹⁷ No credit is more expensive than no credit at all.

A troubling barrier to the participation of small producers in export production is the cost of monitoring for pesticide violations. Many of the cases of produce that did not pass pesticide regulations at the U.S. border have been associated with small producers, such as strawberry growers in Zamora and Irapuato. The difficulty of controlling the use of chemicals approved for the Mexican market, but no longer approved in the United States (e.g. Tamaron), led an Irapuato strawberry cooperative to test all deliveries, creating a much more costly transaction. Clearly, the cost of providing pest management assistance to many small producers individually is high, in contrast with their limited ability to pay for this service. This is another compelling reason for producers to organize themselves in groups, so that technical assistance can be provided in a more efficient manner.

Labor Migration and Costs

Family farms have potential cost advantages, but not all ejidatarios are full-time farmers.

The ability of the family farm to compete by accepting lower-than-market prices for its labor and assets is well known. Small farms operating with family labor, as opposed to hired labor, are motivated to work toward the best possible end product. Vegetable processors that have contracted with ejidatarios in central Mexico are primarily interested in access to plentiful supplies of low-cost, hard-working labor. However, ejidal households have complex insertions into the labor market and often wear several hats that constrain their ability to operate as full-time farmers. The number of households that can participate in fruit and vegetable production is therefore limited, and this is exhibited time and again in our research, with always less than half of the ejidatarios participating.¹⁸

Migration may be a primary labor constraint.

Ejididos in many parts of Mexico are heavily impacted by migration to other parts of the country or to the United States. There is a well-known tendency for young men to migrate, thus removing the most productive laborers from the village. Therefore, the notion that ejidos have surplus labor available for more labor-intensive crops is often unfounded. It is not unusual that outside labor must be hired to carry out production and the cost of this labor may actually be higher than the cost to nearby large commercial farms. For example, one reason a frozen vegetable firm cited for halting contracting with an ejido in the south of Guanajuato was that wages were 50 percent higher than hired labor in the central Bajío. Projects that require significant increases in labor may not be feasible in villages that are heavily committed to migration, as the opportunity cost of labor is too high.

Migration may also provide capital for production.

On the positive side, migration often provides remittances that could be invested in the operating costs of fruit and vegetable production or in purchasing a truck, tractor or additional land. Though researchers have found that migrant remittances are invested mainly in family consumption (Mines, Massey, Lozano et al), this may have a great deal to do with the resource constraints of the villages studied and the limited return to investment in agriculture. We find that in heavily migration-impacted areas that also have prosperous

¹⁸Degree of full to part-time farming is a function of assets, opportunity costs, educational level, and other regional and household characteristics.

agriculture, remittances from "back and forth" migrants¹⁹ are used as a source of capital. It is probable that the current credit squeeze has led to increased use of remittances for production.

The current crisis provides new opportunities.

The real dollar cost of labor in 1995 is as low as it has been in rural Mexico in 35 years. This provides an opportunity to be competitive in labor-intensive activities, such as fruit and vegetable production. Though some have predicted a massive out-migration from rural areas, this appears to be very uneven. In areas of high population growth and eroded resource base, such as the Mixteca region of Oaxaca, migration is accelerating. But in many traditional areas of maize agriculture, the ability of families to produce subsistence crops and supplement family income with local non-farm employment is holding them in the villages. The maize producing families that are inclined toward full-time farming have an opportunity to maximize their use of family and relatively cheap hired labor in diversifying into higher value, labor-intensive crops.

Cultural Factors

There are historical and cultural factors that strongly influence both the willingness and ability of traditional maize producers to seriously undertake diversification into higher value crops. Even when the climatic and agronomic conditions are favorable for such diversification, many producers are reluctant to change their traditional agricultural practices. This is partially a function of educational levels and the historical paternalistic relationship with government and local *caciques*. Ejidatarios and *minifundistas* have not been encouraged to improve their lot through agricultural entrepreneurship, but rather to accept the benefits provided by government and to maintain the status quo. As these benefits are eliminated, however, and their status quo deteriorates, ejidatarios are being forced to defend themselves in new ways.

Deep-seated anti-peasant biases impede transition.

There are deep-seated biases against ejidatarios and minifundistas in Mexican society, driven by class divisions, educational gaps, resentment of government "hand-outs" to this sector, and racial discrimination against indigenous groups. Such biases impede the formation of real partnerships between large and small producers; the former think of ejidatarios as simply providers of land and labor, and the latter suspect that they will always be exploited in such a relationship. In Michoacán, a FIRA-proposed potato production project to join a large and experienced local potato producer with two ejidos based on shared costs, risk and profits, fell through in large part because of mistrust by both parties.

Nevertheless, there are cases of mutually advantageous alliances between the private and ejidal sectors, including some of the *"asociaciones en participación"* promoted by FIRA. Most horticulture associations involving ejidatarios and private firms are not formally organized, but come about through opportune linking of ejidal land, labor, water and infrastructure with private capital, technical assistance and marketing in both fresh and processed operations. This is the case of vegetable contract operations in the Bajío, chili contracting in Quintana Roo, the Del Cabo cooperative in Baja California, and, with mixed results, strawberry processing in Irapuato. Though most private vegetable producers simply rent ejidal

¹⁹The NAWS (National Agricultural Workers Survey) estimates the total number of Mexico based farm workers in the U.S. at 480,000, 80% of whom do not own farm land in Mexico but most of whom are children of ejidatarios (Mines and Bocalandro, 1993).

land, alliances where the ejidatarios contribute as farming partners represent an alternative development path for Mexican agriculture.

Biases can be overcome through organization.

There is a need for small fruit and vegetable producers to organize themselves to overcome the biases and limited opportunities they face as individuals. It is clear that through organization such producers can reduce their input costs, access credit and technical assistance, and improve their negotiating power for obtaining better prices and payment arrangements. However, historical and cultural factors also explain a generalized reluctance in the ejidal sector to work cooperatively. Organizations in the past have often been created for political ends and subjected to manipulation by corrupt leaders, and frequently have faltered because of inter-personal jealousies and mistrust.²⁰ The common desire to do everything independently will have to be overcome or many small producers will not survive, especially in fruit and vegetable production.

AN ALTERNATIVE MODEL FOR DIVERSIFICATION OF EJIDAL AGRICULTURE.

Though it is certainly possible for individuals to diversify into fruit and vegetable production without any assistance or without being part of an organized project or group, it is likely that leaving small producers to "market forces" will tend to exclude them from sustained profitable alternatives, for many of the reasons discussed above. We argue that there are positive social externalities from diversifying ejidal production through the creation of a dynamic small farm sector with consequent improved rural welfare and reduced out-migration. Therefore, it is important to identify a range of actors who can mobilize resources to promote such diversification, overcoming the obstacles that currently exist.

Among these potential actors are larger Mexican farmers, foreign farmers, agribusiness firms, credit unions, economic development NGOs, and cooperative groups of ejidatarios, with appropriated but limited assistance from government. What these actors need to bring are means to access markets, financing, and technology, and provide the seed money - the first push - to make the project happen. Private farmers and firms invest their own money; credit unions charge their members for these services; NGOs participate with donated funds from foundations or development banks; and cooperatives seek multiple formal and non-formal sources of funding. Proper functioning of these types of partnerships require that all parties contribute their own resources and that accounting be transparent.

We propose a sketch of one possible model for the development of diversified ejidal fruit and vegetable production, by and for the above mentioned actors:

1. **Identify sustainable opportunities.** There are many examples of successful, traditional fruit and vegetable production throughout Mexico, from the traspatio level to commercial scale. Cases that have good potential for intensification or expansion need to be identified. Such potential depends upon land, water and labor availability, the interest of producers in the project, their disposition toward organization, and, perhaps most important of all, marketing opportunities.

2. **Conduct a market study early on.** Once a good opportunity has been identified, the next step is to conduct a serious market study. Any large agribusiness firm starts with an analysis of markets. Unfortunately, this point has escaped many endeavors at small farm diversification, leading to much

²⁰For an enlightening discussion of these difficulties, see Girault 1993.

excellent production that could not be sold at a profitable price. We have found a continuing tendency to focus on production rather than marketing. Therefore, prior to the organization and production stage, it is essential to search for profitable market niches, whether local, national or international. Funding must be sought to carry out this type of study.

3. Design a marketing strategy. If there is good market potential, a strategy for fully exploiting that potential must be designed. Depending on the crop, this may include dual fresh and processed markets, bringing up the need for links with processors. It will almost certainly include a means to increase the value of the produce through selection, grading and packing, which may well require establishing a packing house. Supply and demand conditions need to be studied, which may indicate opportunities for producing off-season to realize higher prices.

The strategy should clearly define the most promising marketing channels, with their respective quality requirements. The role of intermediaries in selling the produce also needs to be defined, even if that means simply deciding to avoid all intermediaries. Where feasible, alliances with marketing organizations that will advance money and provide technical assistance should be pursued. Finally, it is important to assess carefully the benefits of organized versus individual marketing and, when warranted, a strategy for marketing cooperatively should be designed.

4. Organize the producers. We have argued that dealing with small producers is inherently expensive in terms of transaction costs. Moreover, small producers face major barriers to accessing credit, technical assistance and markets for diversification. These obstacles can at least partially be overcome through organization. The organization, whether a Sociedad de Solidaridad Social (SSS) cooperative or some other traditional or new form, can help small farmers to produce and market far more efficiently through a series of collective actions, e.g. obtain credit and other inputs at preferential rates, hire technical assistance, interface with marketing agents, provide information, organize transport and machinery services, and carry out marketing functions such as grading, packing and loading. Organizations can also serve to pool risks and smooth prices over time.

We have pointed out a strong resistance to working cooperatively in many ejidos. Nevertheless, our research shows that small farmers are often ready and willing to organize if the economic benefits are clear, honest leaders can be identified, and inter-personal conflicts can be minimized. The participation of a trusted professional can be useful for ensuring that accounts are transparent and costs, risks and benefits are evenly distributed. Also, it is important to limit the size of these organizations to ensure that they are democratic and responsive to members' needs.

5. Obtain start-up capital. Once the marketing strategy has been designed and the producers organized, start-up capital will be required for the intended fruit or vegetable project. We have acknowledged the scarcity and high cost of formal credit for small farm projects. Nevertheless, there are a variety of other possibilities for acquiring start-up capital, including advances by buyers and processors, capital supplied by partners, government programs such as Solidaridad, and self-financing from remittances and retained earnings. High levels of indebtedness should be avoided because of the inherent riskiness of growing fruits and vegetables, and ejidatarios' generally limited capacity to repay.

6. Produce with adequate technical assistance. High quality, sustained technical assistance is crucial to the success of commercial fruit and vegetable production, especially for farmers with little experience growing these crops. It is critical that this assistance be delivered on the farm, be continuous, and be maintained over a long period. The trend in Mexico is toward complete privatization of technical assistance services, so small producers must learn to seek out and pay for these services, if possible on a

profit-sharing basis to motivate high quality assistance. Since Mexico lacks sufficient experts in fruit and vegetable production, and most of these are located in the northern states, producer organizations may need to seek assistance from distant agencies (*despachos*). We have also examined a number of cases where processors and agribusiness partners provide technical assistance, and have noted the importance of accounting for these costs to ensure financial viability.

7. Start small and plan growth. Even when a fruit and vegetable production project starts off well, there are many pitfalls that lie in the way of sustained success over time, calling for the development of a medium-term business plan. One critical aspect is the design of a growth plan for including more producers, keeping in mind the advantages of starting small and limiting scale to a manageable level, but also addressing the optimal scale requirements of packing or processing operations. It is also important to establish an operating capital fund out of retained earnings (forced savings of members).²¹ This type of reserve fund can help the organization survive difficult financial periods. Finally, the business plan needs to evaluate the costs and financing possibilities for improving and expanding production and marketing over time, including the relative costs and benefits of hiring full-time professional staff.

CONCLUSION

In the past, the GOM created a parallel “social” economy for the ejidal sector with a multitude of subsidized services that are now being dismantled or privatized as part of its long-term modernization plan (Appendini 1995). At present, ejidal production is characterized by stagnation or decline in reaction to the current vacuum of effective services, whether public or private, and the 1995 post-devaluation negative terms of trade.

If ejidatarios are expected, under neo-liberal reforms, to compete in an open market economy, it is imperative that the GOM recognize and address the market failures that occur in Mexican agriculture, particularly for small-holders: failures of information, credit, input supply and output markets. Furthermore, small-holders making the transition to more intensive cropping patterns need to engage new partners, primarily from the private and NGO sectors, to access a *package* of technology, finance and marketing assistance, as well as support for organizing to reduce transaction costs and optimize marketing opportunities.

We do not maintain that more intensive agriculture, such as fruit and vegetable production, is a solution for all ejidatarios. In fact, probably only about 15% of ejidatarios (\cong 350,000) have water, land and labor conditions that would permit viable operations, and many of those are probably not inclined to become competitive farmers. Nevertheless, there is a significant group that could survive, compete and prosper if the obstacles addressed in this paper were overcome.

We believe that the social rate of return of supporting small-holder participation in commercial agriculture is high and the economic rate of return is positive in the medium to long-term. Subsistence food production will certainly continue in the Mexican ejidal sector, without significant external support. However, for a sector of these small-holders to make a successful transition to more intensive, remunerative agriculture, it is crucial that the GOM recognize, as governments have recognized around the world, the need for “pull factors” that ease the initial higher costs and risks inherent in this transition. Such costs will pay off in beneficial multiplier effects throughout rural Mexico that exceed the benefits of the

²¹Such a fund is required by the SSS cooperative rules.

default neo-liberal model where fruit and vegetable production is left to large producers hiring migrant seasonal farm workers.

REFERENCES

- Abler, David G. and Daniel Pick. "NAFTA, Agriculture, and the Environment in Mexico". *Amer. J. Agr. Econ.* 75 (August 1993). 794-798.
- Anson, Richard. Overview of a Developing Country's Fruit and Vegetable Production and Domestic Market System: The Case of the Role and Prospects of the Mexican Small Farmer. Draft. Monterrey: Instituto Tecnológico y de Estudios Superiores de Monterrey, 1977.
- Appendini, Kirsten. Changing Agrarian Institutions: Interpreting the Contradictions. Paper presented at the Workshop on Ejidal Reform Research, UCSD, August 1995.
- Benito, Carlos A. Mexico Export of Fruits and Vegetables: Policy Issues. Report prepared for the Inter-American Development Bank, 1990.
- Berry, Albert, and William R. Cline. *Agrarian Structure and Productivity in Developing Countries*. Baltimore: John Hopkins University Press, 1979.
- Bivings, Leigh, and David Runsten. Potential Competitiveness of the Mexican Processed Vegetable and Strawberry Industries. Report to the Ministry of Agriculture, Fisheries and Food, British Columbia, July, 1992.
- Consejo Nacional Agropecuario. Estadísticas Básicas del Sector Agropecuario 1981-1990. Mexico: CNA, 1991.
- Cook, Roberta L., Carlos Benito, James Matson, David Runsten, Kenneth Shwedel, and Timothy Taylor. "Implications of the North American Free Trade Agreement for the U.S. Horticultural Sector", in *American Farm Bureau Research Foundation, NAFTA: Effects on Agriculture, Volume IV*, Park Ridge, Illinois, 1991.
- Cook, Roberta L. and Kenneth Shwedel. Mexico Frees Up Investment in Agriculture. Washington, D.C.: US Department of Agriculture. 1992.
- Coordinación General de Desarrollo Agroindustrial (CODAI). El desarrollo agroindustrial y los sistemas alimentarios básicos: legumbres y hortalizas. Documentos Técnicos para el Desarrollo Agroindustrial, No. 4. México, D.F.: Secretaría de Agricultura y Recursos Hidráulicos. 1982.
- Cruz Hernández, Isabel. La integración de las uniones de crédito del sector social al sistema financiero mexicano. AMUCSS, México. Paper presented at the XIX LASA International Conference, Washington, D.C., Sept. 1995.
- Dutrenit Bielous, Gabriela y Alexandre Oliveira Vera-Cruz. Factores de éxito y fracaso de las asociaciones de empresarios agropecuarios y productores rurales en México. Análisis de casos. Santiago de Chile: FAO. 1991.
- _____. "Las Asociaciones en participación, camino para modernizar el campo". *Comercio Exterior*. 42:6. 1992.
- Fuller, Stephen W. The U.S.-Mexico Free Trade Agreement: Agricultural Transportation Issues. Texas Agricultural Market Research Center Report. Department of Agricultural Economics, Texas A&M University. Research Report No. IM-7-91. 1991.
- Girault, Antoine. La organización de productores minifundistas en la producción de hortalizas en el Estado de Puebla. CIESTAAM Reporte de Investigación No. 15. Chapingo: Universidad Autónoma Chapingo. 1993.

Gómez Cruz, Manuel Angel and Rita S. Rindermann. México en el mercado hortícola mundial. Algunos datos. CIESTAAM. *Comercio Exterior*. April 1994.

Gómez Cruz, Miguel Angel, Rita S. Rindermann, y Alejandro Merino Sepúlveda. La producción de hortalizas de México y el Tratado de Libre Comercio con EUA y Canadá. CIESTAAM Reporte de Investigación No. 6. Chapingo: Universidad Autónoma Chapingo. 1991a.

_____. El Consumo de Hortalizas en México. Chapingo: Universidad Autónoma Chapingo. 1991b.

Gordillo, Gustavo. Más allá de Zapata: Por una reforma campesina. México, D.F.: Cal y Arena. 1992.

Lozano Ascencio, Fernando. Bringing it Back Home: Remittances to Mexico from Migrant Workers in the United States. Monograph no. 37. La Jolla: Center for U.S.-Mexican Studies, University of California, San Diego, 1993.

Marsh, Robin and D. Runsten, "Del Traspatio a la Exportación: El Potencial para la Producción Campesina de Frutas y Hortalizas en México." In *Nuevos Procesos Rurales en Mexico, Vol. I*, UNAM, Instituto de Investigaciones Sociales, México, D.F., México, October 1995.

Marsh, Robin and D. Runsten, "The Potential for Small Holder Fruit and Vegetable Production in Mexico: Barriers and Opportunities." Paper presented at the XIX LASA International Conference, Washington, D.C., October 1995.

Marsh, Robin R. Technology generation and diffusion in an uncertain environment: alternatives approaches to maize production in Mexico. Ph.D. dissertation, Stanford University, CA, 1991.

Massey, Douglas, R. Alarcón, J. Durand & H. González. *Return to Aztlan: The Social Progress of International Migration from Western Mexico*. Berkeley: University of California Press, 1987.

Mines, Richard. Developing a Community Tradition of Migration: A Field Study in Rural Zacatecas, Mexico and California Settlement Areas. Monograph Series, no. 3. La Jolla: Center for U.S.-Mexican Studies, University of California, 1981.

Moulton, Kirby, and David Runsten. The Frozen Vegetable Industry of Mexico. University of California Cooperative Extension. Unpublished Report, 1986.

Myhre, David. The Achilles' Heel of the Rural Reforms: The Inadequate Rural Financial System. Paper presented at the Workshop on Ejidal Reform Research, UCSD, August 1995.

Rosset, Peter M. Non-Traditional Export Agriculture in Central America: Impact on Peasant Farmers. Working Paper No. 20. Fresh Fruit and Vegetables Globalization Network. University of California, Santa Cruz, 1991.

Runsten, David. "Competition in Strawberries." In: *Competitiveness at Home and Abroad*. Report of a 1986-87 Study Group on: Marketing California Specialty Crops: Worldwide Competition and Constraints, p. 47-60. University of California Agricultural Issues Center, 1987.

Runsten, David, and Linda Wilcox. Demand for Labor, Wages, and Productivity in Mexican Fruits and Vegetables: Preliminary Estimates and Implications for NAFTA. Paper presented at LASA, Los Angeles, September, 1992.

Runsten, David and M. Kearney. A Survey of Mixtec Village Networks in California. Davis: California Institute for Rural Studies, 1994.

SARH/Subsecretaría de Política Sectorial y Concertación (SPSC). Proyecto de Tipología de Productores del Sector Social: Diseño Estadístico de la Encuesta. SARH/INEGI, México D.F., 1989.

SARH/SPSC. Primer Informe Nacional sobre Tipología de Productores del Sector Social. Proyecto SARH-CEPAL, Junio de 1992a.

SARH/SPSC. Clasificación y Grados de Diversificación de los Distritos de Desarrollo Rural por Cultivo. Proyecto SARH-CEPAL, Julio de 1992b.

SARH. PROCAMPO: Vamos al grano para progresar. SARH, México, 1993.

SRA/CEPAL/UC Berkeley. El Sector Ejidal en la Agricultura Mexicana: Impacto de las Reformas, 1990-94 (draft report). University of California, Berkeley. December 1994.

Stanford, Lois. Mexico's Fresh Fruit and Vegetable Export System: Recent Developments and Their Impact on Local Economies. Working Paper No. 12. Fresh Fruit and Vegetables Globalization Network. University of California, Santa Cruz, 1991.

Stanford, Lois. "Peasant Resistance in the International Market: Theory and Practice in Michoacán, Mexico." In: *Research in Economic Anthropology*, Vol. 13, p. 67-91, JAI Press Inc., 1991.

United States General Accounting Office (GAO). U.S.-Mexico Trade: Extent to Which Mexican Horticultural Exports Complement U.S. Production. Briefing report to the Chairman, Committee on Agriculture, House of Representatives. March 1991.

United States Department of Agriculture (USDA)/Economic Research Service. NAFTA: Situation and Outlook Series. International Agriculture and Trade Reports. May 1995.

USDA/ERS. U.S.-Mexico Fruit and Vegetable Trade, 1970-92. Agricultural Economic Report Number 704, by Susan L. Pollack and Linda Calvin. April 1995.

USDA/ERS. Agriculture in a North American Free Trade Agreement: Analysis of Liberalizing Trade Between the United States and Mexico. Foreign Agricultural Economic Report No. 246. September 1992.

William, Simon and Ruth Karen. Agribusiness and the Small-Scale Farmer: A Dynamic Partnership for Development. Westview Press, Boulder, 1985.