

# The adjustment strategies *of Mexican ejidatarios* in the face of *neoliberal reform*

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Since 1988 the ejido sector in Mexico has been buffeted by a series of policy changes and exogenous shocks that have brought into question the agricultural viability of the sector as a whole. These changes – trade liberalization, privatization, falling subsidies, the abolition of price controls, macroeconomic shocks, devaluation and momentous changes in the legal framework governing land use in the ejido – have led to a radical reordering of the policy framework and incentive structure under which the farmers of these communal lands operate. The cumulative effect of these reforms has theoretically been to give ejido producers the freedom and flexibility to adjust to changes in the incentive structure and emerge as viable, competitive producers in an increasingly globalized economy. Unfortunately, the hoped-for benefits first of sectoral reform, then of macroeconomic reform, have not materialized. The author provides a brief history of the ejido sector and the Salinas/Zedillo reforms. He then discusses in broad terms the responses that ejidatarios have made to these neoliberal reforms and the subsequent macroeconomic crisis. This is followed by a detailed look at the different components of this changing situation: land accumulation, risk-averse agriculture, scarcity of credit, livestock accumulation, diversification into off-farm activities and income structure. The principal tools of analysis are categorization of households on the basis of changes in these different components and comparison of the characteristics and asset positions of households engaged in different response strategies. The article concludes by analysing the consequences of these response strategies for State development policy in the rural sector in Mexico.

# I

## Introduction

The characteristics of the ejido sector on the eve of the twenty-first century differ greatly from those with which it began over 60 years ago. The Mexican Land Reform, with its unique community (or ejido) land grant mechanism, was born of peasant demands for land brought on by the Mexican Revolution. While the importance of community and an attachment to the land remain, the predominantly agricultural economy of the 1930s has given way to a tremendously diversified one with an array of household income generation strategies. Today, ejidatarios and their children are just as likely to be working in off-farm wage activities such as the inbond assembly industry, or in a restaurant in Los Angeles, as growing maize and beans on the family plot. Almost half of all ejido household income derives from sources other than agricultural or livestock production, while over 60% of all households have some family member working off farm.

While the shift towards income diversification has been a gradual one, since 1988 the ejido sector has been buffeted by a series of policy changes and exogenous shocks that have brought into question the agricultural viability of the sector as a whole. These changes—trade liberalization, privatization, falling subsidies, the abolition of price controls, macroeconomic shocks, devaluation and momentous changes in the legal framework governing land use in the ejido—have led to a radical reordering of the policy framework and incentive structure under which ejido producers operate.

The cumulative effect of these reforms has theoretically been to give ejido producers—representing over 75% of all agricultural producers and 70% of national maize production—the freedom and flexibility to adjust to changes in the incentive structure and emerge as viable, competitive producers in an increasingly globalized economy. Unfortunately, the hoped-for benefits first of sectoral reform under President Salinas, then of macroeconomic reform under President Zedillo, have not materialized.

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Utilizing 1994-1997 panel data from a national survey of ejido producers, we analyse the way households have responded to these changes. From the data, it is evident that most producers have chosen to cope, rather than compete, in agriculture. What this coping entails is staying in maize and fodder—and, in the case of larger, modernized farms, increasing the area of these crops under cultivation—rather than expanding into higher value crops. This has been accompanied by further diversification into off-farm waged and own-account activities, and particularly migration to the United States, as well as increases in cattle stocks. For ejidatarios with small and medium-sized farms, off-farm activities have come to be the primary source of income.

What these tendencies have in common is that they are part of a risk-averse, or risk spreading, complementary income generation strategy in the face of uncertainty and non-existent or incomplete markets. Limited access to agrarian institutions providing credit, technical assistance and so on, combined with severe output price risk brought on by macroeconomic instability, makes the production of relatively low-risk and low-cost maize more attractive, despite the steady decline in its real price. The lower returns and heightened uncertainty associated with agricultural production mean that ejido households are increasingly diversifying into off-farm working activities, though relatively few leave agriculture altogether.<sup>1</sup>

A portfolio diversification strategy of this kind enables households to spread income risk among a variety of income generating activities. In certain cases, these off-farm activities may also ease the credit and liquidity constraints faced by producers, although in most instances the income from them appears to be consumed or invested in livestock holdings. Furthermore, leaving off-farm activities aside, those households that have scope to adjust their agricultural strategies are decidedly better off than those that do not have this room for manoeuvre, even if they are expanding

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<sup>1</sup> Risk aversion in agricultural strategies does not mean that ejidatarios are not taking risks, as these are implicit in diversification into off-farm activities, particularly international migration.

into low-risk, low-return crops. Lastly, given the high cost or non-existence of formal institutions in the ejido sector, livestock production can operate as a savings or insurance mechanism as well as an important source of on-farm consumption.

Our conclusions are, firstly, that the predominance of risk-averse agricultural strategies among ejido households means that Mexico is losing its chance to capitalize on the opportunity offered by reform of Article 27. Unfortunately, the conditions are not in place for producers to use their newly acquired land assets productively. While the withdrawal of inefficient producers from agriculture was an explicit component of the reforms, poor incentives and an institutional vacuum threaten the existence of many potentially viable producers. Lacking profitability, these producers are forced to enter the labour market or migrate to urban centres and the United States. Wholesale diversification of this sort clearly does not constitute a permanent solution for Mexican rural development.

Secondly, despite the negative incentive structure and patchy government support, those households that have adequate levels of agricultural assets, and thus the scope to achieve at least partial adjustment through agriculture, are clearly better off than those that do not have these resources. Studies in this area have shown that ejido producers can respond if credit and liquidity constraints are eased. Thus, potentially large rewards could be reaped if government were to take action to revitalize agrarian institutions and services that can

reduce the risk and enhance the productivity of on-farm activities.

On the other hand, the complexity and diversity of the ejido sector suggest that the correct policy response is one that encompasses not just agricultural development, but rural development more generally. Meeting the challenge of reducing rural poverty, stemming the flow of migrants to urban areas and increasing the welfare of rural inhabitants will entail not just reducing risk and raising productivity in agriculture, but also providing the framework for an integrated rural development strategy. This would include measures to increase human capital, infrastructure improvements to attract investment and provide better communications and, above all, jobs.

The analysis carried out here is based on data taken from a nationally representative sample of ejido households. Panel data were collected from 1,287 households, covering 261 ejidos, at two points in time, the spring and early summer of 1994 and 1997.<sup>2</sup> The survey covers a wide array of household assets including land, livestock, machinery and education, as well as household demographics, labour and land market participation, migration, agricultural and livestock production and participation in organizations. Community level data were also collected on the characteristics and organization of the ejido. The surveys were carried out by the Agrarian Reform Secretariat and the World Bank with assistance from the University of California, Berkeley.

## II

### Brief history of the ejido and the Salinas/Zedillo reforms

The land reform process in Mexico was the result of pressure from the peasantry who played a key role in the Mexican Revolution during the second decade of the twentieth century. Land and water resources were granted by the President of the Republic not individually but to communities or groups of producers, known as ejidos. Indigenous communities recognized as such were given a different status, and were termed agrarian communities. Each ejidatario, or comunero, was given usufruct rights over a parcel of land, access

to common lands, the right to an urban plot and voting rights in the ejido assembly.<sup>3</sup>

<sup>2</sup> A detailed description of the Mexican data and their sampling properties can be found in Cord (1998a). The total 1997 dataset, panel and non-panel, numbered 1,665 households. A large proportion of these households were in Chiapas, a state from which no observations were drawn in 1994 owing to the armed insurrection early that year.

<sup>3</sup> See De Janvry, Gordillo and Sadoulet (1997) for a good description of the social and political background to the ejido.

As of 1996, over 29,000 legally constituted ejidos and agrarian communities were in existence (INDA, 1996), controlling more than half the nation's irrigated and rainfed land and over 70% of its forest cover. This land reform (or social) sector includes more than 3 million ejidatarios, accounting for over 75% of all agricultural producers in the country. More than 15 million people directly depend on ejido lands for part of their livelihood. In 1992, the land reform sector contributed over 70% of the country's output of maize and 80% of that of beans (De Janvry and others, 1995).

The question of whether ejido producers are more or less productive than farmers in the private sector is one that has been much debated.<sup>4</sup> While ejido peasants as a group have been the recipients of much State largesse and patronage, this has come at the cost of inflexibility in production and political control. Many State policies, furthermore, have benefited private and ejido producers alike; indeed, State investment in agriculture since the Cárdenas presidency (1934-1940) has tended to favour private and ejido commercial farming rather than the ejido sector as a whole (Thiesenhusen, 1996 and Heath, 1990).

Furthermore, it is unclear whether the community structure of the ejido has had a positive or negative effect on productivity. While often clearly playing a role in increasing access to credit, common natural resources, pooled labour resources and economies of scale for the purchase of agricultural machinery, the ejido has often been undermined by corruption and inefficiency, as local caciques and government agents use the legal structure to further their personal interests at the expense of the ejido. Both Dovring (1969) and Heath (1990) have shown that, controlling for farm size, few differences in productivity can be found between ejido and private producers.

During the presidency of Carlos Salinas de Gortari (1988-1994), Mexico embarked upon a programme of structural reforms that has worked and will continue to work profound transformations in its economy and society. The Government joined the General Agreement on Tariffs and Trade (GATT), signed the North American Free Trade Agreement (NAFTA) with Canada and the United States, initiated changes in the system of land ownership in the ejido (land reform) sector affecting over half the country's territory and modified the role of the State in credit, marketing and other agricultural support services.

<sup>4</sup> See Thiesenhusen (1996) for a concise summary of this debate.

Sectoral reforms centred on trade liberalization, the curtailment of State intervention in agriculture and cattle production and the reduction and redirection of subsidies, particularly as regards credit and technical assistance. This involved doing away with quantitative restrictions and licensing-in requirements, reducing tariffs, deregulating input and output markets and abolishing price guarantees, with the exception of maize and bean prices. As development bank credit came to be restricted to producers with productive potential and without debt arrears, a new national welfare institution arose, Pronasol, which in agriculture functioned as a provider of credit to poor rainfed producers and as a promoter of rural development initiatives. The impact of the reforms was aggravated by a macroeconomic policy that resulted in high interest rates and an overvalued exchange rate, as well as a slowdown in the overall rate of economic growth. The impact of this profitability crisis differed greatly between households, having the severest effects on those farmers who participated in output markets and/or used purchased inputs in agricultural and cattle production.<sup>5</sup>

The federal Government used two main programmes to support agricultural and livestock-producing households. In 1994 it initiated an income support programme, Procampo, with the goal of compensating basic grain and oilseed farmers for the negative impact expected to result from the abolition of price guarantees and market support under NAFTA. In 1996, the Government created the Alianza para el Campo (Countryside Alliance) programme. The goal of Alianza was to enhance agricultural and livestock productivity through small investment projects financed jointly by the Government and producers. While Procampo reached over 80% of all ejidatarios in 1997, only 12% of ejido households participated in Alianza.

The backbone of the agricultural sector reforms was the 1992 reform of Article 27 of the Constitution, which formally ended the process of land reform in Mexico. This reform established a legal process, called *Procede*, whereby land rights were delineated within the ejido and land titles provided, and whereby ejidos, if authorized by the assembly, could then privatize individual parcels and eventually sell or rent out their land. The explicit objective of the reforms was to foster a modernized and efficient agricultural sector. Those farmers who were unable to compete were expected to leave agriculture (Télliez Kuenzler, 1994).

<sup>5</sup> See De Janvry, Gordillo and Sadoulet (1997) and Davis (1997) for a description of the impact of the reforms during this period.

In addition to this law, which was highly controversial and which many feared would signal the end of the ejido in Mexico, the reform also established a body of regulations, covering land transactions both prior and subsequent to privatization, which served as “candados” or lock-ins by making it harder to sell ejido land. Although by 1994 little progress had been made in the cumbersome process of delineating land rights within the ejido under the *Procede* programme, the liberalizing climate surrounding controls over the ejido had led to an increase in informal transactions, as is evident from the data available for this study.

The start of the Zedillo administration (1994-2000) was greeted by a severe currency crisis, which led to a large devaluation (120% between December 1994 and March 1995), high levels of inflation and

macroeconomic instability right through 1996. The severity of the crisis and the subsequent macroeconomic instability overshadowed the impact of NAFTA for most of the agricultural sector, and it was this, combined with the continuing implementation of *Procede*, that was the main determinant of change in ejido household economic strategies over the 1994-1997 period.

In response, the Government tightened monetary and fiscal policy and continued with the structural adjustment of the economy, including deregulation and privatization of the transport sector and implementation of Article 27 reform (Cord, 1998a and 1998b). By December 1997, 79% of all ejidos had at least made a start with the *Procede* programme, while 59% had received title. Very few ejidos had opted for *dominio pleno*, or full privatization of their plots.

### III

## How ejidatarios have responded

Macroeconomic instability since 1994 and implementation of Article 27 reform have brought forth a variety of responses from ejido households, these responses being conditioned by the level of household access to a variety of income-producing assets. A first response involves the accumulation of land and the expansion of maize production; a second, further diversification into off-farm activities, particularly migration to the United States; and a third, the accumulation of cattle in conjunction with both increased maize growing and migration. Of overriding importance to all ejido household adjustment strategies, however, whether explicitly or as future options, are diversification into non-agricultural or livestock activities, which has been very widespread, and the pervasive influence of the United States labour market. Almost 45% of all households have a family connection in the United States, whether in the form of a current migrant or children and siblings of the head of the household residing permanently there. That this connection is alive and vibrant is shown by the high incidence of remitters (43%) among family members living in the United States.

These broad responses can be broken down. Despite the negative incentive framework and the rising cost of inputs, a core of modernized producers has been joined by a new group, and together these have led an

expansion of the maize growing area. For many producers, including a large proportion of indigenous households, expansion into maize and fodder has been accompanied by the accumulation of cattle. Similarly, a group of new United States migrants have invested their off-farm earnings in cattle accumulation. Another group has expanded fruit and vegetable production, based not on access to irrigation but rather on agro-ecological factors. Those households that have the land, livestock and human capital assets needed to adjust successfully have significantly higher incomes than households without such assets.

The largest subgroup of ejidatarios, however, consists mostly of subsistence peasant producers, often indigenous, with little access to assets, institutions or government support, who are more constrained in their ability to adjust. They continue to depend on subsistence production of maize and beans, and have diversified heavily into low-paying local wage labour. These households, with less land, livestock, migration and human capital assets, have significantly lower household incomes than the households referred to above that have been able to adjust successfully. Without access to adequate levels of assets, these households will continue to struggle in the current austere macroeconomic environment.

Lastly, the adjustment responses exhibited by indigenous households from different parts of the country refute the assumption, common in sectoral analysis

and political debate, that indigenous households are homogeneous in terms of living standards and asset levels.

## IV

### Key components of ejidatarios' adjustment strategies

#### 1. Land accumulation

Reform of Article 27 of the Mexican constitution has brought about significant changes in patterns of land ownership and control in the Mexican ejido. From 1994 to 1997, the amount of quality-adjusted land assets under individual control increased by over 25% from an average of 8 NRE (National Rainfed Equivalents)<sup>6</sup> hectares in 1994 to 10 NRE hectares in 1997. This increase in individual control over land assets is a factor behind many of the changes in household income generation strategies described in the rest of this paper. These include increases in cattle accumulation, crop area given over to maize and fodder and maize market participation as sellers, as table 1 shows.<sup>7</sup>

This change in land ownership patterns came about through unexpected channels. One of the results promised for Article 27 reform was that land markets would be formalized and become more efficient. The *Procede* certification process was intended to increase the frequency of land sales and rentals. However, analysis shows that while *Procede* did indeed have a significant impact in stimulating land markets, particularly for small, poor landholders (Olinto, Deininger and Davis, 2000), the largest increase in rentals owed more to the passage of the law than to the formal process of certification (Olinto, 1998).

More importantly, however, in terms of the change in total land area, ejidos, in anticipation of or as part of the *Procede* delineation process, or simply because of the atmosphere created by Article 27 reform, began to

divide up common land resources among their ejidatarios, so that vast tracts of pasture and forest land came under individual control, both formally and informally. Part of the increase in land assets was also due to quality improvements, as our measure adjusts for quality: in many cases rainfed land became irrigated,<sup>8</sup> particularly in the North and Pacific North, while elsewhere forest was converted into pasture or rainfed agricultural land.<sup>9</sup>

Without more detailed study it is difficult to determine the exact importance of each of these different changes in the land situation. As can be seen in table 1, without adjusting for quality, the average amount of irrigated, rainfed and forest land per household increased significantly from 1994 to 1997. The relative insignificance of pasture land masks widespread shifts between the forest, pasture and rainfed categories. The Gulf region has been the scene of the greatest of these changes, which we suspect are primarily due to the division of the Commons.<sup>10</sup> One negative consequence has been the creation of a new class of large producers, *latifundistas* from a Mexican historical perspective, controlling over 100 NRE hectares of land apiece. The ten producers concerned (up from one in 1994 in the panel subset) account for over 25% of the total increase in new land under individual control.

Nonetheless, the new *latifundia* aside, these changes do not appear to have worsened the distribution of individually controlled land. Except for a few

<sup>6</sup> Land was aggregated, adjusting for quality, into National Rainfed Equivalents. Details of the construction of this land aggregate can be found in Davis, 1997.

<sup>7</sup> Means tests in all tables are the following: for 0,1 variables, the null hypothesis is rejected if  $c > 3.84$  (2 tails, 10%\*) or 5.02 (2 tails, 5%\*\*); for continuous variables, the null hypotheses is rejected if  $t > 1.65$  (2 tails, 10%) or 1.96 (2 tails, 5%).

<sup>8</sup> This increase is due not to a widespread programme to expand irrigation, but rather to the variable nature of much of Mexican irrigation.

<sup>9</sup> That this should be regarded as a quality improvement does not mean that it is better or preferable from a social point of view, simply that rainfed land is considered to have higher economic potential.

<sup>10</sup> This has been confirmed in further recent field work by Carlos Munoz of the University of California, Berkeley.

TABLE 1

**Mexico (ejidos): Household characteristics by changes in land asset category, 1994 and 1997<sup>ab</sup>**

|                                 | Units            | Overall |        |       | Less land |        |       | More land |        |       | No change |        |       |
|---------------------------------|------------------|---------|--------|-------|-----------|--------|-------|-----------|--------|-------|-----------|--------|-------|
|                                 |                  | 1994    | 1997   | Tests | 1994      | 1997   | Tests | 1994      | 1997   | Tests | 1994      | 1997   | Tests |
| Number of weighted observations |                  | 1 308   | 1 308  |       | 120       | 120    |       | 381       | 381    |       | 806       | 806    |       |
| Land assets                     |                  |         |        |       |           |        |       |           |        |       |           |        |       |
| <i>Total</i>                    | NRE <sup>c</sup> | 8.10    | 10.06  | ++    | 14.53     | 3.58   | --    | 5.40      | 15.90  | ++    | 8.40      | 8.27   | --    |
| Irrigated                       | has.             | .95     | 1.35   | ++    | 1.80      | .46    | --    | .51       | 2.29   | ++    | 1.03      | 1.04   | --    |
| Rainfed                         | has.             | 5.74    | 6.80   | ++    | 6.33      | 3.06   | --    | 4.53      | 8.73   | ++    | 6.23      | 6.44   | -     |
| Pasture                         | has.             | 3.04    | 3.63   |       | 8.57      | .49    | --    | 1.75      | 7.27   | ++    | 2.83      | 2.38   | --    |
| Forest                          | has.             | .31     | .98    | +     | .40       | .45    |       | .32       | 2.14   | ++    | .28       | .51    | -     |
| Cattle                          |                  |         |        |       |           |        |       |           |        |       |           |        |       |
| Heads of cattle                 | no.              | 5.70    | 6.66   | +     | 9.04      | 5.47   |       | 5.46      | 7.92   | ++    | 5.31      | 6.25   |       |
| Agricultural production         |                  |         |        |       |           |        |       |           |        |       |           |        |       |
| Maize, irrigated                | has.             | .38     | .76    | ++    | .78       | .43    |       | .29       | 1.39   | ++    | .37       | .51    | --    |
| Maize, rainfed                  | has.             | 2.93    | 3.01   |       | 3.20      | 1.71   | --    | 2.55      | 3.25   | ++    | 3.07      | 3.09   |       |
| Fodder, irrigated               | has.             | .09     | .17    |       | .02       | .06    |       | .21       | .48    | +     | .05       | .03    | --    |
| Fodder, rainfed                 | has.             | .96     | 1.24   |       | .62       | .55    |       | .71       | 1.68   | ++    | 1.13      | 1.14   |       |
| Other basic grains              | has.             | .27     | .43    | +     | .61       | .66    |       | .11       | .50    | ++    | .30       | .36    |       |
| Oilseeds                        | has.             | .45     | .35    |       | 1.08      | .91    | ++    | .10       | .34    | +     | .52       | .28    | -     |
| Agricultural technology         |                  |         |        |       |           |        |       |           |        |       |           |        |       |
| HYV                             | %                | 18      | 23     | ++    | 18        | 20     |       | 14        | 28     | ++    | 20        | 22     |       |
| Chemicals                       | %                | 45      | 49     | ++    | 39        | 39     | --    | 42        | 55     | ++    | 47        | 48     |       |
| Household income                |                  |         |        |       |           |        |       |           |        |       |           |        |       |
| <i>Total</i>                    | Pesos            |         | 25 495 |       |           | 18 219 | --    |           | 28 995 | ++    |           | 24 931 |       |
| Land markets                    |                  |         |        |       |           |        |       |           |        |       |           |        |       |
| Purchased                       | %                |         | 4      |       |           | 3      |       |           | 9      | ++    |           | 2      | --    |

<sup>a</sup> ++ means significant at the 5% level; + means significant at the 10% level.

<sup>b</sup> The first test column tests differences in means between 1994 and 1997 values, while the second is the test of the 1997 value against the sum of all other categories. In some cases, land planted is greater than land assets, since rented land is not included in the calculation of land assets. Households are placed in the "more land" category if they accumulated 50% more land from 1994 to 1997. Households in the "same" category increased or decreased their land holdings by less than 50% from 1994 to 1997.

<sup>c</sup> In NRE (National Rainfed Equivalent) hectares.

households that have sold off their holdings, the accumulation of land has benefited landowners of all sizes. Table 2, a matrix of 1994 and 1997 land categories, clearly shows the movement of households to greater land sizes. While approximately 50% of all households remained in the same category, the majority of the remainder moved up in category, while a smaller number moved down. A comparison of Gini coefficients between the two years shows little change.

## 2. Risk-averse agriculture

### a) Cropping patterns

The 1994 devaluation, coupled with deregulation in the agricultural sector, gave rise to expectations of improved international competitiveness and diversification into higher value crops. Instead, ejido producers showed little change in cropping patterns from 1994 to

1997, and trends seen during the 1990-1994 period were reaffirmed. Maize and beans, along with fodder crops, remained the staples of most producers, large and small, in most regions of the country. In fact the maize

TABLE 2  
Mexico (ejidos): Matrix of land assets, 1994 and 1997

|              |       | 1994                             |     |     |      |       |     |       |
|--------------|-------|----------------------------------|-----|-----|------|-------|-----|-------|
|              |       | Land asset categories (hectares) |     |     |      |       |     |       |
|              |       | 0                                | e-2 | 2-5 | 5-10 | 10-18 | >18 | Total |
| 1997         | 0     | 0                                | 10  | 4   | 6    | 4     | 1   | 25    |
|              | e-2   | 0                                | 133 | 48  | 4    | 1     | 0   | 186   |
|              | 2-5   | 0                                | 81  | 232 | 43   | 12    | 4   | 372   |
|              | 5-10  | 2                                | 13  | 95  | 160  | 26    | 10  | 306   |
|              | 10-18 | 2                                | 6   | 33  | 74   | 119   | 21  | 255   |
|              | >18   | 1                                | 3   | 13  | 23   | 58    | 65  | 163   |
| <i>Total</i> |       | 5                                | 246 | 425 | 310  | 220   | 101 | 1307  |

growing area was expanded, primarily by larger, irrigated farms, partially at the expense of higher value crops such as wheat and oilseeds, while the majority of peasant farmers continued to depend on maize.

While this tendency from 1990 to 1994 was ascribed to higher guaranteed prices for maize, from 1994 to 1997 real maize prices underwent significant decreases. The continued reliance on maize in 1997 is linked to the low price risk and production costs of this crop by comparison with higher value crops, considerations that were particularly important in a situation of economic uncertainty compounded by poor institutional support and weak marketing channels (see Cord, 1998a and Olsen, 1998). Many households also prefer the quality of home-grown native varieties to the imported or HYV maize used in most of the dough and tortillas available for purchase. Also, a mistaken belief among farmers that they had to continue to grow basic grains in order to receive Procampo benefits may have influenced the decision of many of them to stay in maize production.

Most producers continued to grow maize and beans between 1994 and 1997. Almost 75% of households planted monocropped maize, while 19% intercropped maize with other crops, primarily beans. The proportion of households growing fruit and vegetables and fodder, the next most important crop groups, remained essentially unchanged between 1994 and 1997.

The expansion of maize growing becomes evident when looked at from the perspective of the area under cultivation. This expansion occurred primarily on larger, irrigated farms planting in the autumn-winter season, the very farms that were expected to diversify into higher value crops. Table 3 shows the irrigated area under cultivation, in the aggregate and by farm size. The average area given over to monocropped maize per household more than doubled from 1994 to 1997, continuing the trend seen during the earlier period. Similarly, the area under fodder crops almost doubled. This growth came partly from an increase of almost 50% in the amount of irrigated land under cultivation, which reversed the 1990-1994 trend towards a decrease in the irrigated area. The remainder of the growth in maize and fodder production came at the expense of wheat and oilseeds (particularly soya beans): the area of the latter dropped to zero, completing the long-term decline in the production of those crops. Again, most of this change took place on larger farms.

In table 4, households are categorized according to changes in the area planted with maize over the survey period. Comparison of households that expanded

TABLE 3

**Mexico (ejidos): Average irrigated area per crop by year and farm size (hectares), 1990, 1994 and 1997**

|                            | 1990 | 1994 | 1997 |
|----------------------------|------|------|------|
| <b>Maize (monocropped)</b> | 0.25 | 0.39 | 0.79 |
| < 5 has                    | 0.16 | 0.10 | 0.13 |
| ≥ 5 has                    | 0.46 | 0.79 | 1.41 |
| <b>Wheat</b>               | 0.30 | 0.16 | 0.13 |
| < 5 has                    | 0.01 | 0.01 | 0.00 |
| ≥ 5 has                    | 0.66 | 0.37 | 0.25 |
| <b>Oil seeds</b>           | 0.16 | 0.07 | 0.00 |
| < 5 has                    | 0.00 | 0.00 | 0.00 |
| ≥ 5 has                    | 0.37 | 0.16 | 0.00 |
| <b>Fodder</b>              | 0.09 | 0.10 | 0.18 |
| < 5 has                    | 0.02 | 0.02 | 0.01 |
| ≥ 5 has                    | 0.18 | 0.20 | 0.34 |

maize production with those that reduced it or kept it unchanged shows that the former were larger, modernized producers. These tended to have more land assets and land in use than the other categories, and were the only category of households to increase cattle stocks significantly over the survey period. A significantly larger proportion of these households used HYV seeds in production, and they showed the largest increase in use of these from 1994 onwards. Their farms were spread out geographically across the country, and they had higher than average household incomes.

By contrast, households that reduced the area under maize showed significantly lower technology use in both 1994 and 1997, and did not accumulate cattle. Part of this decrease was transferred to other basic grains, while a significantly higher proportion of households rented out land. These households were located to a disproportionate extent in the North, and less in the Gulf region.

The largest group of maize producers maintained their level of production. These primarily rainfed-based peasant producers showed little change in agricultural production, with the exception of the area under fodder, but expanded their participation in off-farm wage labour and temporary migration to the United States. Generally speaking, these households had lower levels of education and production assets (land, cattle and machinery). Their limited ability to adjust through agriculture resulted in their having significantly lower incomes than other households.

While irrigated, modernized producers were primarily engaged in driving the expansion of maize



TABLE 4

**Mexico (ejidos): Household characteristics by changes in maize area category, 1994 and 1997<sup>ab</sup>**

|                                  | Units                  | Less maize |        |       | More maize |         |       | No maize |        |       | No change |        |       |
|----------------------------------|------------------------|------------|--------|-------|------------|---------|-------|----------|--------|-------|-----------|--------|-------|
|                                  |                        | 1994       | 1997   | Tests | 1994       | 1997    | Tests | 1994     | 1997   | Tests | 1994      | 1997   | Tests |
| Number of weighted observations  |                        | 196        | 196    |       | 362        | 362     |       | 124      | 124    |       | 625       | 625    |       |
| Land assets                      |                        |            |        |       |            |         |       |          |        |       |           |        |       |
| <i>Total</i>                     | <i>NRE<sup>c</sup></i> | 9.98       | 10.39  |       | 7.38       | 11.41++ | ++    | 12.54    | 14.66  | ++    | 7.04      | 8.27++ | --    |
| Irrigated                        | has.                   | 1.24       | 1.37   |       | .83        | 1.78++  | ++    | 2.45     | 3.55   | ++    | .63       | .67    | --    |
| Rainfed                          | has.                   | 7.31       | 6.89   |       | 5.10       | 7.49++  | +     | 6.57     | 6.44   |       | 5.46      | 6.44++ |       |
| Cattle                           |                        |            |        |       |            |         |       |          |        |       |           |        |       |
| Heads of cattle                  | no.                    | 6.63       | 6.47   |       | 4.84       | 7.00++  |       | 10.18    | 9.38   | ++    | 5.01      | 5.99   | +     |
| Human capital                    |                        |            |        |       |            |         |       |          |        |       |           |        |       |
| Education, head of household     | years                  |            | 3.41   |       |            | 2.96    |       |          | 4.09   | ++    |           | 2.97   | --    |
| Average adult education          | years                  |            | 4.59   |       |            | 4.70    |       |          | 6.01   | ++    |           | 4.23   | --    |
| Migration                        |                        |            |        |       |            |         |       |          |        |       |           |        |       |
| Current migrant to United States | %                      | 3          | 13++   | ++    | 3          | 6       |       | 3        | 10     |       | 2         | 8++    |       |
| Capital assets                   |                        |            |        |       |            |         |       |          |        |       |           |        |       |
| Tractor ownership                | %                      |            | 10     |       |            | 9       |       |          | 17     | ++    |           | 5      | --    |
| Truck ownership                  | %                      |            | 10     |       |            | 14      |       |          | 19     | ++    |           | 9      | --    |
| Agricultural production          |                        |            |        |       |            |         |       |          |        |       |           |        |       |
| Maize, irrigated                 | has.                   | .71        | .07--  | --    | .24        | 1.87++  | ++    | .00      | .00    | --    | .44       | .48    | --    |
| Maize, rainfed                   | has.                   | 4.64       | .91--  | --    | 1.74       | 4.53++  | ++    | .00      | .00    | --    | 3.66      | 3.38   | ++    |
| Fruit and vegetables, irrigated  | has.                   | .21        | .10    |       | .13        | .09     |       | .29      | .42    | ++    | .04       | .06    | --    |
| Fruit and vegetables, rainfed    | has.                   | .24        | .44    |       | .40        | .52     |       | .73      | .74    | +     | .33       | .37    |       |
| Other basic grains               | has.                   | .45        | 1.00   | ++    | .22        | .18     | -     | .78      | 1.70   | ++    | .14       | .14    |       |
| Oilseeds                         | has.                   | .86        | 1.01   | ++    | .47        | .06--   | --    | 1.67     | 1.63   | ++    | .07       | .07    | --    |
| Agricultural technology          |                        |            |        |       |            |         |       |          |        |       |           |        |       |
| HYV                              | %                      | 22         | 22     |       | 17         | 28++    | ++    | 25       | 29     |       | 16        | 20     | --    |
| Household income                 |                        |            |        |       |            |         |       |          |        |       |           |        |       |
| <i>Total</i>                     | <i>Pesos</i>           |            | 22 131 |       |            | 30 047  | ++    |          | 37 949 | ++    |           | 21 401 | --    |
| Land markets                     |                        |            |        |       |            |         |       |          |        |       |           |        |       |
| Rented more out                  | %                      |            | 10     | +     |            | 3       | --    |          | 19     | ++    |           | 5      | --    |
| Rented more in                   | %                      |            | 3      | --    |            | 13      | ++    |          | 14     |       |           | 8      |       |

<sup>a</sup> ++ means significant at the 5% level; + means significant at the 10% level.

<sup>b</sup> The first test column tests differences in means between 1994 and 1997 values, while the second is the test of the 1997 value against the sum of all other categories. Categorization is based on a 50% change in the maize area planted.

<sup>c</sup> In NRE (National Rainfed Equivalent) hectares.

growing, some of them formed part of a small but important core of non-maize producers. Located primarily in the Pacific North, these farmers have given over significantly more land to non-maize crops than other producers, although this area did not expand over the survey period. In addition to having higher than average land and cattle holdings to begin with, however, these farmers had access to significantly larger amounts of United States migration assets, owned more capital assets and had higher levels of education, all of which translated into higher than average household income. In other words, these households were better off to begin with. This was achieved with lower levels of government support during the survey period, as compared to maize producers, in the form of Procampo and formal credit.

#### b) *Technology use*

From 1994 to 1997 the proportion of households using technological inputs in agriculture rose overall, in some cases back up to 1990 levels, although the pattern varied by crop and planting season. This rise was due in part to the impact of two government programmes. The increase in the use of high yield variety (HYV) seeds can be partly attributed to the "kilo for kilo" component of Alianza para el Campo and to Procampo transfers, in the case of basic grain producers.<sup>11</sup>

<sup>11</sup> Sadoulet, De Janvry and Davis (1999) show that Procampo had a significant and positive effect on the likelihood of agricultural technology being adopted over this period.

TABLE 5

**Mexico (ejidos): Agricultural input use of farming households,  
by year and farm size (NRE hectares), 1990, 1994 and 1997**

|   | 1990  |     |     | 1994  |                   |     |     | 1997  |                   |     |     |
|---|-------|-----|-----|-------|-------------------|-----|-----|-------|-------------------|-----|-----|
|   | All   | e<5 | >5  | All   | Test<br>1990-1994 | e<5 | >5  | All   | Test<br>1994-1997 | e<5 | >5  |
| Number of weighted observations           | 1 531 | 861 | 671 | 1 273 |                   | 720 | 553 | 1 273 |                   | 601 | 635 |
| % of households using agricultural inputs |       |     |     |       |                   |     |     |       |                   |     |     |
| HYV                                       | 24    | 15  | 37  | 19    | —                 | 11  | 29  | 25    | ++                | 12  | 37  |
| Fertilizer                                | 63    | 63  | 63  | 54    | —                 | 56  | 50  | 60    | ++                | 60  | 60  |
| Natural                                   | 10    | 10  | 10  | 4     | —                 | 4   | 3   | 13    | ++                | 13  | 13  |
| Chemical                                  | 56    | 56  | 56  | 51    | —                 | 53  | 49  | 53    |                   | 54  | 52  |
| Chemicals                                 | 56    | 46  | 69  | 47    | —                 | 36  | 62  | 52    | ++                | 38  | 66  |
| Technical assistance                      | 61    | 54  | 71  | 9     | —                 | 5   | 14  | 7     | -                 | 3   | 11  |
| % using each input source                 |       |     |     |       |                   |     |     |       |                   |     |     |
| Self-supply                               | 20    | 18  | 23  | 10    | —                 | 10  | 9   | 12    |                   | 10  | 13  |
| Official                                  | 64    | 58  | 71  | 10    | —                 | 5   | 15  | 13    | +                 | 13  | 12  |
| Commercial                                | 58    | 53  | 65  | 61    |                   | 55  | 69  | 69    | ++                | 63  | 76  |
| Social                                    | 12    | 11  | 13  | 16    | ++                | 13  | 19  | 6     | —                 | 3   | 8   |
| % using each payment method               |       |     |     |       |                   |     |     |       |                   |     |     |
| Cash                                      | -     |     |     | -     |                   |     |     | 74    |                   | 68  | 79  |
| Credit                                    | -     |     |     | -     |                   |     |     | 12    |                   | 10  | 14  |
| In kind                                   | -     |     |     | -     |                   |     |     | 1     |                   | 1   | 1   |
| No payment                                | -     |     |     | -     |                   |     |     | 15    |                   | 21  | 8   |
| Other                                     | -     |     |     | -     |                   |     |     | 1     |                   | 0   | 0   |

The rise in the proportion of farming households using HYV seeds, fertilizer and chemicals reversed the downward trend seen from 1990 to 1994. If farms are categorized by size, as in table 5, it transpires that large farms made more extensive use of both HYV seeds and chemicals, as they had in previous years, and were behind the increased use of inputs. Inputs were increasingly purchased from commercial sources, while the role of social organizations (both ejido and producer organizations) decreased significantly. Access to technical assistance continued to be extremely low for producers of all classes.

Table 6 shows who entered and left high yield production,<sup>12</sup> which allows a clearer picture to emerge. Analysis of those households that changed their agricultural input use shows that the changing incentive structure led some producers to leave modernized, high

yield agriculture for increasing diversification into off-farm activities, principally United States migration. These producers, most of whom were located in the North, retained their land assets but rented out more land and reduced the area given over to maize, thus reorienting maize production towards self-sufficiency.

Meanwhile, a different group of producers, located disproportionately in the Gulf, became new users of HYV seeds and chemicals. Unlike the previous group, these producers were investing in and modernizing agricultural production. They exhibited high rates of land and cattle accumulation and used their land to produce increasing amounts of maize, fodder and basic grains. This trend was accompanied by a significant increase in access to technical assistance.

The new modernizers joined a core group of technologically advanced producers who used inputs in both periods. These producers, located disproportionately in the Pacific North and Gulf regions,

<sup>12</sup> Defined as use of HYV seeds and/or chemicals.

TABLE 6

**Mexico (ejidos): Household characteristics by changes in input use category, 1994 and 1997<sup>ab</sup>**

|                                  | Units | New input use |         |       | Old input use |      |         | Input use discontinued |   |      | No input use |       |   |      |        |    |
|----------------------------------|-------|---------------|---------|-------|---------------|------|---------|------------------------|---|------|--------------|-------|---|------|--------|----|
|                                  |       | 1994          | 1997    | Tests |               | 1994 | 1997    | Tests                  |   | 1994 | 1997         | Tests |   |      |        |    |
|                                  |       |               |         | A     | B             |      |         | A                      | B |      |              | A     | B |      |        |    |
| Number of weighted observations  |       | 251           | 251     |       |               | 499  | 499     |                        |   | 143  | 143          |       |   | 407  | 407    |    |
| Land assets                      |       |               |         |       |               |      |         |                        |   |      |              |       |   |      |        |    |
| Irrigated                        | has.  | .83           | 1.49 ++ |       |               | 1.29 | 1.77 +  | ++                     |   | 1.52 | 1.51         |       |   | .41  | .70 ++ | -- |
| Rainfed                          | has.  | 5.04          | 7.04 +  |       |               | 6.45 | 7.96 ++ | ++                     |   | 7.04 | 6.41         |       |   | 4.87 | 5.39   | -- |
| Cattle                           |       |               |         |       |               |      |         |                        |   |      |              |       |   |      |        |    |
| Heads of cattle                  |       |               |         |       |               |      |         |                        |   |      |              |       |   |      |        |    |
| Human capital                    | no.   | 4.01          | 6.6 ++  |       |               | 8.13 | 9.07    | ++                     |   | 6.97 | 6.83         |       |   | 3.35 | 3.73   | -- |
| Average adult education          | years |               | 4.56    |       |               |      | 4.85    | ++                     |   |      | 4.62         |       |   |      | 4.27   | -- |
| Migration                        |       |               |         |       |               |      |         |                        |   |      |              |       |   |      |        |    |
| Current migrant to United States | %     | 1             | 8 ++    |       |               | 3    | 5       | --                     |   | 4    | 18 ++        | ++    |   | 2    | 9 ++   |    |
| Institutions and organizations   |       |               |         |       |               |      |         |                        |   |      |              |       |   |      |        |    |
| Formal credit                    | %     | 24            | 22      |       |               | 29   | 26      | ++                     |   | 32   | 10 --        | --    |   | 26   | 10 --  | -- |
| Total credit                     | %     | 26            | 37 ++   | ++    |               | 32   | 42 ++   | ++                     |   | 34   | 18 --        | --    |   | 28   | 18 --  | -- |
| Technical assistance             | %     | 1             | 6 ++    |       |               | 16   | 11 -    | ++                     |   | 10   | 1 --         | --    |   | 2    | 1      | -- |
| Agricultural production          |       |               |         |       |               |      |         |                        |   |      |              |       |   |      |        |    |
| Maize, irrigated                 | has.  | .47           | 1.01 ++ |       |               | .48  | 1.24 ++ | ++                     |   | .62  | .37          |       |   | .13  | .16    | -- |
| Maize, rainfed                   | has.  | 3.12          | 3.43    | +     |               | 3.45 | 3.88    | ++                     |   | 3.13 | 2.18 -       | --    |   | 2.12 | 1.99   | -- |
| Fodder, irrigated                | has.  | .05           | .50 ++  | ++    |               | .20  | .16     |                        |   | .06  | .01          |       |   | .01  | .03    | -- |
| Fodder, rainfed                  | has.  | .63           | 1.84 ++ | ++    |               | 1.34 | 1.57    | +                      |   | 1.82 | 1.48         |       |   | .41  | .40    | -- |
| Other basic grains               | has.  | .12           | .59 ++  |       |               | .32  | .53     |                        |   | .75  | .59          |       |   | .13  | .15    | -- |
| Government programmes            |       |               |         |       |               |      |         |                        |   |      |              |       |   |      |        |    |
| Alianza para el Campo            | %     |               | 14      |       |               |      | 18      | ++                     |   |      | 5            | --    |   |      | 7      | -- |
| Procampo                         | %     |               | 89      | ++    |               |      | 88      | ++                     |   |      | 81           |       |   |      | 76     | -- |
| Household income                 |       |               |         |       |               |      |         |                        |   |      |              |       |   |      |        |    |
| Total                            | Pesos |               | 27 193  |       |               |      | 30 499  | ++                     |   |      | 26 116       |       |   |      | 18 373 | -- |
| Regions                          |       |               |         |       |               |      |         |                        |   |      |              |       |   |      |        |    |
| North                            | %     |               | 21      |       |               |      | 9       | --                     |   |      | 33           | ++    |   |      | 31     | ++ |
| Pacific North                    | %     |               | 5       | -     |               |      | 13      | ++                     |   |      | 14           |       |   |      | 6      | -- |
| Centre                           | %     |               | 35      |       |               |      | 28      | --                     |   |      | 35           |       |   |      | 41     | ++ |
| Gulf                             | %     |               | 28      | ++    |               |      | 34      | ++                     |   |      | 5            | --    |   |      | 5      | -- |
| South                            | %     |               | 11      |       |               |      | 16      |                        |   |      | 14           |       |   |      | 18     | +  |
| Land markets                     |       |               |         |       |               |      |         |                        |   |      |              |       |   |      |        |    |
| Rented more out                  | %     |               | 5       |       |               |      | 6       |                        |   |      | 11           | ++    |   |      | 7      |    |
| Rented more in                   | %     |               | 12      |       |               |      | 13      | ++                     |   |      | 8            |       |   |      | 5      | -- |

<sup>a</sup> ++ means significant at the 5% level; + means significant at the 10% level.

<sup>b</sup> Test column A tests differences in means between 1994 and 1997 values, while column B is the test of the 1997 value against the sum of all other categories.

also accumulated more cattle and land, rented more land from others and increased production of all crops, with the exception of other basic grains. These “old modernizers” had significantly greater access to technical assistance, credit, Alianza and Procampo, and higher levels of education. They also had higher household incomes than the other categories.

Those households that did not use inputs in either period tended to be smaller, poorer landholders, a subset of the stagnant maize producers category described in the previous section. These peasant producers accumulated land during the panel period, but had significantly less land of all types than other farmers. They participated less in maize and land markets, had fewer migration, human capital and livestock assets,

and were heavily dependent on off-farm activities, primarily local agricultural wage labour, to supplement their meagre agricultural and cattle income. Overall, these households had significantly lower total household incomes. They were located primarily in the North and Centre regions, and to a lesser extent in the Gulf, and had less access to Alianza and Procampo.

### c) *Scarcity of credit*

Providing access to adequate financial resources has to be a key component of any sectoral programme that has the goal of increasing agricultural competitiveness. Unfortunately, credit remains scarce for producers in the ejido sector. At first glance, it seems that access to credit declined precipitously between 1994 and 1997. While 30% of households had some kind of formal or informal credit in 1994, by 1996 and 1997 this proportion had dropped to 20% in each year. Most of this decline was due to the ending of the Pronasol programme, which was only partially made up for by an increase in the use of informal sources. Access to Banrural credit remained more or less constant at around 5%, while other types of formal public-sector or commercial credit were negligible. If access to credit is taken for 1996 and 1997 together, however, over 10% of panel households had Banrural credit. Going back to table 5, only 12% of households received agricultural inputs on credit.

The drop caused by the ending of Pronasol is somewhat deceptive, however. Although its conceptual origins were different, Pronasol was similar in practice to the Procampo programme. While Pronasol was conceived as a way of providing interest-free loans to smaller producers for agricultural inputs, Procampo is meant to compensate basic grain producers for the trade liberalization provisions of NAFTA. The goal is to provide this income transfer in time for it to be used in the purchase of agricultural inputs, whence the similarity to Pronasol. Procampo has much wider coverage than Pronasol ever did, reaching more than 80% of all ejido households. In this respect, then, there has been a tremendous increase in credit. The amounts provided are too small, however, to entice producers to take the risk of diversifying beyond maize and other basic grains.

Nonetheless, econometric studies using ejido data have shown that to some extent Procampo payments do in fact ease the credit and/or liquidity constraints that pervade the ejido sector. Sadoulet, De Janvry and Davis (1999) find that Procampo transfers have a multiplier effect on total agricultural and livestock income.

For every peso given in transfers, 2 pesos' worth of household income is generated. These results are indicative both of the hunger for financing that exists and of the actual and potential returns that can be generated by easing credit and liquidity constraints in the ejido sector.

Households that did receive formal credit in 1997, as shown in table 7, display special characteristics. Those households that received formal credit for the first time in 1997, or had credit in both periods, had agriculture as their primary economic activity and were dynamic producers using high yield technologies and increasing the amount of land they rented from others. Both groups received over half their 1997 credit from Banrural and had a significantly higher incidence of participation in Alianza and Procampo. Both had significantly higher incomes than those households that did not receive credit in 1996 or 1997.

Important differences separate these groups, however. The new credit recipients had significantly greater areas under maize, and 17% of these households went into fruit and vegetable production. This increase in agricultural production was helped by a large rise in land holdings, and was accompanied by an increase in input use. Over 50% sold their maize at market. Moreover, these households had significantly lower participation in waged activities owing to their success in agriculture and cattle production. A significantly higher percentage of them were from the Gulf region,<sup>13</sup> and a lower percentage from the South and North.

Existing credit recipients, on the other hand, expanded maize production partly at the expense of other basic grains and oilseeds. These households maintained their off-farm activities and expanded into United States migration; they already had high levels of input use in 1994, and this continued to be the case in 1997. This group includes the traditionally modernizing producers of the North Pacific, as well as other regions.

Those households that received formal credit in 1994 but no longer did so in 1996 or 1997 were mainly Pronasol recipients who received no credit, even of an informal kind, in 1997. A significantly higher proportion of these well educated households left maize and fodder production while expanding into off-farm activities, particularly United States migration. There is

<sup>13</sup> The data show that the Gulf region was particularly favoured with access to government programmes (Alianza, Procampo, credit and technical assistance) during this period (see Cord, 1998b). Two reasons may account for this. Yucatan and Tabasco states both had nationally important elections for governors, and the governor of Yucatan is a former Secretary of Agrarian Reform.

TABLE 7

**Mexico (ejidos): Household characteristics by changes in credit use category, 1994 and 1997<sup>ab</sup>**

|                                  | Units | Credit use discontinued |        |       | New credit use |        |       | Previous credit use |        |       | No credit use |        |       |
|----------------------------------|-------|-------------------------|--------|-------|----------------|--------|-------|---------------------|--------|-------|---------------|--------|-------|
|                                  |       | 1994                    | 1997   | Tests | 1994           | 1997   | Tests | 1994                | 1997   | Tests | 1994          | 1997   | Tests |
|                                  |       |                         |        | A B   |                |        | A B   |                     |        | A B   |               |        | A B   |
| Number of weighted observations  |       | 262                     | 262    |       | 145            | 145    |       | 97                  | 97     |       | 802           | 802    |       |
| Land assets                      |       |                         |        |       |                |        |       |                     |        |       |               |        |       |
| <i>Total</i>                     | has.  | 10.28                   | 12.00  | ++    | 7.73           | 10.94  | ++    | 9.29                | 11.05  |       | 7.30          | 9.15   | ++ -- |
| Irrigated                        | has.  |                         |        |       |                |        |       |                     |        |       |               |        |       |
| Rainfed                          | has.  | 7.34                    | 8.07   | ++    | 5.63           | 7.01   |       | 5.68                | 5.88   |       | 5.25          | 6.45   | ++ -  |
| Human capital                    |       |                         |        |       |                |        |       |                     |        |       |               |        |       |
| Average adult education          | years |                         | 5.06   | ++    |                | 4.58   |       |                     | 4.87   |       |               | 4.40   | --    |
| Off-farm activities              |       |                         |        |       |                |        |       |                     |        |       |               |        |       |
| Off farm                         | %     | 47                      | 67     | ++ ++ | 44             | 54     |       | 56                  | 62     |       | 41            | 60     | ++    |
| Wage labour                      | %     | 38                      | 49     | ++    | 42             | 34     | --    | 53                  | 50     |       | 35            | 47     | ++    |
| Migration                        |       |                         |        |       |                |        |       |                     |        |       |               |        |       |
| Current migrant to United States | %     | 2                       | 11     | ++ +  | 2              | 2      | --    | 0                   | 7      | ++    | 3             | 8      | ++    |
| Current migrant within Mexico    | %     | 9                       | 6      |       | 14             | 4      | --    | 10                  | 7      |       | 10            | 8      |       |
| Agricultural production          |       |                         |        |       |                |        |       |                     |        |       |               |        |       |
| Maize, irrigated                 | has.  | .41                     | .38    |       | .36            | 1.34   | +     | .71                 | 1.78   | ++ ++ | .34           | .65    | ++    |
| Maize, rainfed                   | has.  | 2.99                    | 2.55   | --    | 3.73           | 4.58   | ++    | 3.73                | 3.32   |       | 2.67          | 2.83   | --    |
| Fruit and vegetables, rainfed    | has.  |                         |        |       |                |        |       |                     |        |       |               |        |       |
| Other basic grains               | has.  | .32                     | 1.03   | ++ ++ | .08            | .11    |       | .26                 | .15    |       | .29           | .33    |       |
| Move into fruit and vegetables   | %     |                         | 8      |       |                | 17     | ++    |                     | 8      |       |               | 7      | --    |
| Agricultural technology          |       |                         |        |       |                |        |       |                     |        |       |               |        |       |
| HYV                              | %     | 22                      | 26     |       | 22             | 23     |       | 33                  | 43     | ++    | 14            | 20     | ++ -- |
| Chemicals                        | %     | 42                      | 43     | --    | 56             | 75     | ++ ++ | 64                  | 65     | ++    | 41            | 45     | --    |
| Government programmes            |       |                         |        |       |                |        |       |                     |        |       |               |        |       |
| Alianza para el Campo            | %     |                         | 10     |       |                | 30     | ++    |                     | 20     | ++    |               | 9      | --    |
| Procampo                         | %     |                         | 86     |       |                | 96     | ++    |                     | 93     | ++    |               | 79     | --    |
| Household income                 |       |                         |        |       |                |        |       |                     |        |       |               |        |       |
| <i>Total</i>                     | Pesos |                         | 29 447 | ++    |                | 32 660 | ++    |                     | 31 734 | ++    |               | 22 236 | --    |
| Regions                          |       |                         |        |       |                |        |       |                     |        |       |               |        |       |
| North                            | %     |                         | 32     | ++    |                | 8      | --    |                     | 16     |       |               | 20     |       |
| Pacific North                    | %     |                         | 17     | ++    |                | 8      |       |                     | 26     | ++    |               | 5      | --    |
| Centre                           | %     |                         | 33     |       |                | 17     | --    |                     | 29     |       |               | 38     | ++    |
| Gulf                             | %     |                         | 7      | --    |                | 59     | ++    |                     | 28     |       |               | 17     | --    |
| South                            | %     |                         | 12     |       |                | 7      | --    |                     | 2      | --    |               | 20     | ++    |
| Land markets                     |       |                         |        |       |                |        |       |                     |        |       |               |        |       |
| Rented more in                   | %     |                         | 9      |       |                | 12     |       |                     | 18     | ++    |               | 8      | -     |

<sup>a</sup> ++ means significant at the 5% level; + means significant at the 10% level.

<sup>b</sup> Test column A tests differences in means between 1994 and 1997 values, while column B is the test of the 1997 value against the sum of all other categories.

likely to be a considerable overlap between this group and those that left high yield agriculture. These households were located disproportionately in the North and Pacific North, but were no poorer than other households in terms of either assets (total land and cattle) or income.

The great majority of ejido households did not receive formal credit in either 1994 or 1997. Such households were poorer in terms of income and asset holdings (land and education) than those households that received credit in either of the panel years. They had smaller plots and were less likely to have received sup-

port from government agricultural sector programmes. They were located primarily in the Centre and Southern regions.

### 3. Livestock accumulation

Livestock production in the ejido sector has three important functions. Firstly, it accounts for over 16% of all income in that sector. Secondly, livestock and livestock derivatives (such as milk and eggs) consumed at home are an integral part of household diets. Thirdly, and perhaps most importantly given the macroeconomic instability and high interest rates that prevailed during this period, animal holdings serve as saving and insurance mechanisms for many producers. In most cases they function as part of a complementary strategy, which may be one of land accumulation and increased maize growing or United States migration.

Accordingly, livestock production is an increasingly important component of income generation strategies among ejido households. The average number of heads of cattle owned increased significantly from 1994 to 1997, growing by almost 20%, although this increase was less than that of the 1990-1994 period. Besides cattle, other kinds of livestock are widely kept. Over half the 1997 households owned poultry and almost 40% pigs. Milk was produced by 25% of households and eggs by 38%.

As was seen in the section on agriculture, cattle accumulation is associated with expansion of the area given over to maize and fodder, as well as fruit and vegetables. To achieve this growth, cattle-accumulating households increased all types of land assets except forest, as table 8 shows. These households had above average input use and Alianza participation rates. Over half the accumulators were new cattle owners.

A key accumulator subgroup was constituted by those households, primarily in the North, whose members migrated to the United States for the first time during the survey period. These cattle-accumulating households had higher than average migration assets in the United States. Conversely, those who decreased their holdings of livestock, or had none, received significantly less in remittances than cattle owners. Those with access to networks in the United States are in a better position to accumulate cattle because they receive remittances and are able to generate temporary migration income. Migration may serve to relax credit constraints that inhibit cattle accumulation.<sup>14</sup> Cattle

<sup>14</sup> This is the conclusion drawn by Sadoulet, De Janvry and Davis (1999).

accumulation may also complement United States migration in that it is relatively non-labour intensive and serves as an investment/saving mechanism for migration income. Overall, accumulating households had significantly higher income than those that decreased their holdings of livestock or had no such holdings.

Those livestock households that maintained the size of their herds, however, did not expand either maize or fodder production or accumulate land, although their 1997 holdings of cattle and land, and the area they had under fodder, were significantly greater than those of the other categories. These households also had significantly higher levels of migration, something that seems to confirm the cattle-migration link discussed earlier. On the other hand, while they increased their off-farm activities during the survey period, in 1997 they still engaged less in these than the other categories. Unsurprisingly, given their large internal demand, these households participated less as sellers in the maize market.

Those that reduced their cattle holdings, on the other hand, also reduced their holdings of pasture land and increasingly rented land out. Although off-farm activities increased somewhat (1997 levels were still significantly lower than among other households), as did United States migration, no strong alternative to the maize-cattle strategy emerged among these households. Thus, it appears that reducing livestock holdings serves the same function as running down savings during difficult economic times.

### 4. Diversification into off-farm activities

It is no longer accurate to think of the ejido sector as primarily agricultural. In terms of both activities and income, ejido households have diversified into the off-farm sector. Off-farm activities serve a variety of purposes, most importantly as sources of income or household consumption. We have found evidence that in some cases these activities may also complement agricultural production by easing the liquidity and credit constraints that afflict the sector.

It is thus not surprising that ejido adjustment is taking place primarily outside agriculture. Households are reacting to price risk, instability in agriculture and declining profitability by further diversifying into income-generating activities outside agriculture. From 1994 to 1997, the proportion of households participating in off-farm activities increased by 33% to stand at 60% of all ejido households. This statistically significant increase was

TABLE 8

**Mexico (ejidos): Household characteristics by changes in cattle ownership category, 1994 and 1997<sup>ab</sup>**

|                                    | Units | Less cattle |      | More cattle |    |      | No change |       |    |       |       |       |    |
|------------------------------------|-------|-------------|------|-------------|----|------|-----------|-------|----|-------|-------|-------|----|
|                                    |       | 1994        | 1997 | Tests       |    | 1994 | 1997      | Tests |    | 1994  | 1997  | Tests |    |
|                                    |       |             |      | A           | B  |      |           | A     | B  |       |       | A     | B  |
| Number of weighted observations    |       | 154         | 154  |             |    | 307  | 307       |       |    | 254   | 254   |       |    |
| Land assets                        |       |             |      |             |    |      |           |       |    |       |       |       |    |
| Irrigated                          | has.  | .59         | 1.27 | +           |    | .58  | 1.03      | ++    |    | 1.32  | 1.20  |       |    |
| Rainfed                            | has.  | 6.29        | 6.40 |             |    | 6.42 | 9.02      | ++    | ++ | 7.47  | 8.76  |       | ++ |
| Pasture                            | has.  |             |      |             |    |      |           |       |    |       |       |       |    |
| Cattle                             |       |             |      |             |    |      |           |       |    |       |       |       |    |
| Heads of cattle                    | no.   | 9.69        | 1.42 | --          | -- | 4.18 | 13.68     | ++    | ++ | 18.34 | 16.84 |       | ++ |
| Proportion with cattle             | %     | 100         |      |             |    |      | 100       |       |    | 100   | 100   |       |    |
| Migration assets                   |       |             |      |             |    |      |           |       |    |       |       |       |    |
| Permanent United States (children) | no.   |             | .69  |             |    |      | .75       |       | ++ |       | .80   |       | ++ |
| Permanent United States (siblings) | no.   |             | .77  |             |    |      | .84       |       |    |       | 1.27  |       | ++ |
| Agricultural production            |       |             |      |             |    |      |           |       |    |       |       |       |    |
| Maize, irrigated                   | has.  | .17         | .41  | ++          |    | .26  | 1.02      | ++    |    | .60   | .53   |       |    |
| Maize, rainfed                     | has.  | 3.44        | 2.88 |             |    | 3.47 | 3.98      |       | ++ | 3.24  | 3.30  |       |    |
| Fodder, irrigated                  | has.  | .00         | .18  |             |    | .04  | .44       | ++    |    | .32   | .21   |       |    |
| Fodder, rainfed                    | has.  | 1.15        | .90  |             |    | 1.32 | 2.28      | +     | +  | 2.14  | 2.46  |       | ++ |
| Agricultural technology            |       |             |      |             |    |      |           |       |    |       |       |       |    |
| HYV                                | %     | 17          | 18   |             |    | 15   | 27        | ++    |    | 25    | 31    |       | ++ |
| Government programmes              |       |             |      |             |    |      |           |       |    |       |       |       |    |
| Alianza para el Campo              | %     |             | 10   |             |    |      | 20        |       | ++ |       | 12    |       |    |
| Procampo                           | %     |             | 77   |             | -  |      | 87        |       | +  |       | 90    |       | ++ |

<sup>a</sup> ++ means significant at the 5% level; + means significant at the 10% level.

<sup>b</sup> Test column A tests differences in means between 1994 and 1997 values, while column B is the test of the 1997 value against the sum of all other categories. Categorization is based on a 50% change in the number of heads of cattle.

seen across all land size categories and encompassed both waged and own-account activities, with the exception of agricultural wage labour. By 1997, 46% of all households were involved in wage labour and 24% in own-account activities. Off-farm wage activities were evenly divided between agricultural and non-agricultural wage labour.<sup>15</sup>

As table 9 shows, two distinct categories of household emerge: those that diversified into wage activities in 1997 or did such work in both periods, and "old" wage households. Both were driven to participate in the labour market by significant declines in land and cattle assets, although the "new" wage households substantially increased the number of heads of cattle under their control. Furthermore, both increased their input use over the survey period. However, the new wage households, located principally in the Gulf and of indigenous origin, expanded primarily into

<sup>15</sup> We do not go into greater detail because most responses for waged and own-account activities were "Other", signifying that the survey's categorization was imprecise.

agricultural wage labour and increased their migration to other parts of Mexico and the United States, while the old wage households were located disproportionately in the Centre and North and engaged primarily in non-agricultural wage labour. These too increased migration to the United States.

## 5. Migration in the ejido

Proximity to the United States is a distinctive feature of the Mexican economy, influencing as it does not only trade, but also the export of labour. By 1997, almost 45% of ejido households had either a family member who had migrated to the United States or children and siblings living there, as shown in table 10. Over 50% of households with more than 5 NRE hectares had had a migratory connection with the United States. Migration to the United States, and to other parts of Mexico, thus dominates household decision-making in the ejido sector. Migration can serve not only as a source of income for consumption, but also as a risk-spreading di-

TABLE 9

**Mexico (ejidos): Household characteristics by changes in wage labour category, 1994 and 1997<sup>ab</sup>**

|                                  | Units       | New wage earners |      |       |    | Old wage earners |      |       |    |
|----------------------------------|-------------|------------------|------|-------|----|------------------|------|-------|----|
|                                  |             | 1994             | 1997 | Tests |    | 1994             | 1997 | Tests |    |
|                                  |             |                  |      | A     | B  |                  |      | A     | B  |
| Number of weighted observations  |             | 327              | 327  |       |    | 278              | 278  |       |    |
| Land assets                      |             |                  |      |       |    |                  |      |       |    |
| <i>Total</i>                     | <i>has.</i> | 6.25             | 8.86 | ++    | -  | 6.38             | 8.17 | ++    | -- |
| Cattle                           |             |                  |      |       |    |                  |      |       |    |
| Heads of cattle                  | no.         | 3.57             | 5.54 | ++    | -  | 2.95             | 3.49 |       | -- |
| Human capital                    |             |                  |      |       |    |                  |      |       |    |
| Average adult education          | years       |                  | 4.69 |       |    |                  | 5.03 |       | ++ |
| Family size                      | no.         |                  | 6.39 |       | ++ |                  | 6.54 |       | ++ |
| Off-farm wage activities         |             |                  |      |       |    |                  |      |       |    |
| Off farm                         | %           | 9                | 100  | ++    | ++ | 100              | 100  |       | ++ |
| Wage labour                      | %           | 0                | 100  | ++    | ++ | 100              | 100  |       | ++ |
| Agricultural wage labour         | %           | 0                | 44   | ++    | ++ | 38               | 31   |       | ++ |
| Migration                        |             |                  |      |       |    |                  |      |       |    |
| Current migrant to United States | %           | 2                | 12   | ++    | ++ | 5                | 12   | ++    | ++ |
| Current migrant within Mexico    | %           | 7                | 11   |       | ++ | 19               | 11   | --    | ++ |
| Agricultural technology          |             |                  |      |       |    |                  |      |       |    |
| HYV                              | %           | 12               | 19   | ++    |    | 16               | 24   | ++    |    |
| Regions                          |             |                  |      |       |    |                  |      |       |    |
| North                            | %           |                  | 22   |       |    |                  | 27   |       | ++ |
| Pacific North                    | %           |                  | 3    |       | -- |                  | 11   |       |    |
| Centre                           | %           |                  | 35   |       |    |                  | 39   |       |    |
| Gulf                             | %           |                  | 28   |       | ++ |                  | 14   |       | -- |
| Ethnicity                        |             |                  |      |       |    |                  |      |       |    |
| Indigenous                       | %           |                  | 22   |       | ++ |                  | 13   |       |    |

<sup>a</sup> ++ means significant at the 5% level; + means significant at the 10% level.

<sup>b</sup> Test column A tests differences in means between 1994 and 1997 values, while column B is the test of the 1997 value against the sum of all other categories.

versification of a household's income generation portfolio. In addition, as we mentioned earlier, it can ease credit and liquidity constraints in agricultural and cattle production. Networks, or migration assets as they are called here, reduce the cost and risk of migration by operating as information gathering mechanisms.<sup>16</sup>

These assets prepared the way for a significant increase in temporary migration to the United States over the 1994-1997 period, as devaluation combined with uncertainty in the agricultural sector to make United States migration more appealing. Whereas in 1994 only 3% of panel households had current migrants in the United States, by 1997 this proportion had reached 8%, almost all of whom were new migrants. Current migration to the United States has a positive

correlation with 1997 farm size, as do migration assets, and new United States migration is strongly correlated with region of origin. The highest rate of new migration is found, not surprisingly, in the North and Centre, while the rates in the Gulf and South, although low, make United States migration a feature of households in the panel sample for the first time.

Typically, it is not the rural asset-poor or destitute who are likely to migrate to the United States, but rather those who have the assets required to cover the significant fixed costs of such migration. Migration assets are also an important factor in facilitating migration, as these networks play a role in providing information (or reducing transaction costs). United States migration assets are also a source of cash income in the form of remittances and of information on advanced agricultural techniques learned by working on farms in the United States. Remittances are often spent on household consumption, particularly home improvements and construction, or invested in businesses.

<sup>16</sup> See Winters, De Janvry and Sadoulet (1999) for an analysis of the impact of community migration networks on the determinants of migration.



TABLE 10

**Mexico (ejidos): Migration by farm size, 1997<sup>a</sup>**  
(Percentage of households with each type of migration)

|   | Farm size (NRE hectares) |     |     | Tests |
|---|--------------------------|-----|-----|-------|
|   | All                      | <5  | >5  |       |
| Number of weighted observations                             | 1 665                    | 782 | 792 |       |
| 1997 migration, temporary                                   |                          |     |     |       |
| United States   | 8                        | 5   | 10  | **    |
| Mexico  | 7                        | 8   | 5   |       |
| Either  | 14                       | 12  | 15  |       |
| Pre-1997 migration, temporary                               |                          |     |     |       |
| United States   | 10                       | 8   | 11  |       |
| Mexico  | 17                       | 21  | 14  | *     |
| Permanent migration (children)                              |                          |     |     |       |
| Living in United States                                     | 21                       | 17  | 24  | **    |
| Living in Mexico but migrating temporarily to United States | 7                        | 5   | 9   | **    |
| Living in Mexico, outside home state                        | 27                       | 28  | 25  |       |
| Living in Mexico, in home state                             | 52                       | 49  | 56  | **    |
| Permanent migration (siblings)                              |                          |     |     |       |
| Living in United States                                     | 22                       | 15  | 27  | **    |
| Living in Mexico but migrating temporarily to United States | 13                       | 8   | 17  | **    |
| Living in Mexico, outside home town                         | 81                       | 75  | 89  | **    |
| Living in Mexico, in home town                              | 83                       | 84  | 83  |       |
| Any migration or relative in United States                  | 44                       | 35  | 52  | **    |

<sup>a</sup> \*\* indicates that means are significantly different at 5%; \* indicates that means are significantly different at 10%; no mark indicates means are not significantly different at 10%.

Households with United States migration assets have significantly larger quantities of all types of assets, with the exception of education (not shown). These households had significantly more land assets in 1994 and 1997, although accumulation rates among households with and without migration assets were almost identical. On the other hand, households with United States migration assets had significantly more heads of cattle in both years and a higher rate of accumulation as well. A significantly larger proportion of these households owned tractors and trucks. This higher level of assets translated into significantly higher incomes. A disproportionately large number of these households lived in the North and Centre regions.

## 6. Income

The structure of income, as shown in table 11, confirms the diversified nature of household economic activities discussed throughout this paper.<sup>17</sup> The importance of

<sup>17</sup> A more detailed analysis of the structure and determinants of income using 1994-1997 data can be found in Davis, De Janvry, Diehl and Sadoulet (2000) and Sadoulet, De Janvry and Davis (1999).

TABLE 11

**Mexico (ejidos): Household income, 1994 and 1997**  
(1994 pesos and percentages)

|                                 | 1994   | 1997   | Change (%) |
|---------------------------------|--------|--------|------------|
| Number of weighted observations | 1 031  | 1 031  |            |
| Total household income (pesos)  | 10 155 | 11 925 |            |
| On farm (% of total income)     | 51     | 44     | -13        |
| Net agriculture                 | 36     | 28     | -22        |
| Net livestock                   | 15     | 16     | 7          |
| Off farm (% of total income)    | 38     | 43     | 11         |
| Wages                           | 30     | 25     | -18        |
| Own-account earnings            | 6      | 10     | 76         |
| Remittances                     | 2      | 8      | 215        |
| Other (% of total income)       | 10     | 13     | 25         |
| Procampo payments               | 0      | 8      | ...        |

non-agricultural working activities is manifest: the 1997 figures in this survey of agricultural households show that most income was not from agricultural or livestock production. Over 44% of total household income derived from off-farm working activities, while almost 13% came from other sources, primarily Procampo payments. Wage labour, constituting 25% of total income, was the most important off-farm income

source, followed by own-account activities and remittances.

The income data also confirm the change in the relative returns of different activities brought about by the crisis. Agriculture suffered, as discussed throughout this paper, with the share of total income contributed by this activity falling by 22%. This was offset to some degree by rising livestock income so that overall income from on-farm activities fell by 13%. Conversely, the share of off-farm income increased by 11%. This increase came from two sources: while the share contributed by wages dropped by 18%, both own-

account and remittance income accounted for a larger share of total income. Other sources also increased by 25%, the bulk of this coming from Procampo transfers.

As table 12 shows, in 1997 these income shares varied by farm size. The share of agricultural income increased with holding size, to stand at 60% (including livestock) for the biggest landholders, while the reverse was true for off-farm activities, which accounted for 60% of the smallest landholders' income, or almost 75% if other income is included. Procampo payments, which depend on the area given over to basic grains, were constant across categories.

TABLE 12

**Mexico (ejidos): Household income by farm size, 1997**  
(1994 pesos and percentages)

|                                 | Farm size (NRE hectares) |       |       |       |        |        |        |
|---------------------------------|--------------------------|-------|-------|-------|--------|--------|--------|
|                                 | Total                    | 0     | e-2   | 2-5   | 5-10   | 10-18  | >18    |
| Number of weighted observations | 1 031                    | 24    | 188   | 365   | 302    | 253    | 159    |
| Total household income (pesos)  | 11 925                   | 7 144 | 5 592 | 7 558 | 14 452 | 13 845 | 21 648 |
| On farm (% of total income)     | 44                       | 23    | 26    | 27    | 45     | 48     | 60     |
| Net agriculture                 | 28                       | 5     | 18    | 14    | 33     | 29     | 35     |
| Net livestock                   | 16                       | 18    | 8     | 12    | 12     | 20     | 25     |
| Off farm (% of total income)    | 43                       | 46    | 60    | 58    | 44     | 39     | 27     |
| Wages                           | 25                       | 40    | 31    | 36    | 31     | 19     | 11     |
| Own-account earnings            | 10                       | 3     | 27    | 17    | 4      | 11     | 8      |
| Remittances                     | 8                        | 3     | 2     | 5     | 9      | 9      | 7      |
| Other (% of total income)       | 13                       | 31    | 14    | 16    | 11     | 13     | 13     |
| Procampo payments               | 8                        | 0     | 8     | 9     | 7      | 9      | 7      |

## V

### Conclusion

The predominance of risk-averse agricultural strategies among ejido households means that Mexico is losing its chance to capitalize on the opportunity provided by reform of Article 27, which entailed a radical restructuring of agrarian relationships in the Mexican countryside. Ejidatarios and their local assemblies were given the freedom to work, rent or sell their land. Unfortunately, the conditions are not in place for producers to use their newly acquired land assets productively. While the withdrawal of inefficient producers from agriculture was an explicit component of the reforms, poor incentives and an institutional vacuum threaten the existence of many potentially viable producers. Lacking profitability, these producers are forced to enter the labour market or migrate

to urban centres and the United States. Sadoulet, De Janvry and Davis have shown that Procampo reduces off-farm diversification, suggesting that credit and liquidity constraints have led to there being more off-farm activity than there would be if adequate resources were available. Wholesale diversification of this sort clearly does not constitute a permanent solution for Mexican rural development.

Agriculture as a viable economic activity for family farmers, though, is not dead. Despite the negative incentive structure and patchy government support, those households that have adequate levels of agricultural assets, and thus the scope to achieve at least partial adjustment through agriculture, are clearly better off

then those that do not have this room for manoeuvre in agriculture. Again, studies using this data have shown that ejido producers can respond if credit and liquidity constraints are eased. Thus, potentially large rewards could be reaped if government were to take action to revitalize agrarian institutions and services that can reduce the risk and enhance the productivity of on-farm activities.

On the other hand, the complexity and diversity of the ejido sector suggest that the correct policy response is one that encompasses not just agricultural development, but rural development more generally. Ejidatarios are no longer primarily farmers, but instead rely on an array of activities to ensure their survival. Thus, meeting the challenge of reducing rural poverty, stemming the flow of migrants to urban areas and increasing the welfare of rural inhabitants will entail not just reducing risk and raising productivity in agriculture, but also providing the framework for an integrated rural development strategy. This would include measures to increase human capital (greater access to education and health services), infrastructure improvements to attract investment and provide better communications and, above all, jobs.

Structural adjustment and stabilization policies created a new context for rural development in the 1990s virtually throughout Latin America and the rest of the developing world. In Mexico, the rural development challenge involves:

i) Factor and product markets that have become less controlled and more global, but in many cases remain incomplete and opaque.

ii) The State which, with its reduced presence, is searching for a relevant role in the countryside. The dismantling of Conasupo, the increasing irrelevance of the Agrarian Reform Secretariat and the disappearance of the ejido from President Zedillo's agenda do not augur well. While the Agricultural Secretariat has taken on the mantle of rural development and embarked on a series of projects for marginal areas that are couched in terms of democracy and producer participation, the impact and nature of these programmes are as yet unclear.

iii) Civil society, which has taken on renewed importance. It remains to be seen, however, how a very heterogeneous assortment of producer organizations, community organizations (including the ejido), NGOs and individual actors will build on this new context.

A renaissance of Mexican agrarian studies –which have a vibrant history, but have withered under the assault of the neoliberal revolution– is required, with a new focus on rural development, to document, describe and motivate the new dynamic of rural development. The subject-matter would have to include not just traditional agrarian issues but also other initiatives in the rural sector, such as the Progreso anti-poverty programme, which influence the economic strategies of rural households.

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