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Land Policy — A decade after the Ejido Reform

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CURRENCY AND EQUIVALENT UNITS

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FISCAL YEAR

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ACRONYMS

ACERCA	Apoyos y Servicios a la Comercialización Agropecuaria (Support and Services for Farming Commercialization)
CONASUPO	Compañía Nacional de Subsistencias Populares (National Company for Peoples Subsistence)
CORETT	Comisión para la Regularización de la Tenencia de la Tierra (Land Tenure Regularization Commission)
DP	Dominio Pleno (Full Property)
FAO	Food and Agriculture Organization
FIFONAFE	Fideicomiso Fondo Nacional de Fomento Ejidal (National Trust Fund for the Development of the Ejidos)
FOAPROA	Fondo de Apoyo a Proyectos Productivos de las Organizaciones Agrarias (Support Fund for Productive Projects of Agrarian Organizations)
GDP	Gross Domestic Product
INEGI	Instituto Nacional de Estadística y Geografía e Informática (National Statistics and Geography Institute)
LA	Ley Agraria (Agrarian Law)
NAFTA	North American Free Trade Agreement
NBFI	Non-bank Financial Intermediaries
OPR	Ordenamiento de la Propiedad Rural (Regularization of Rural Property)
PA	Procuraduría Agraria (Agrarian Juridical Bureau)
PISO	Programa de Incorporación del Suelo Social al Desarrollo Urbano (Program for the Integration of the Social Infrastructure to Urban Development)
PROCAMPO	Programa de Apoyos Directos al Campo (Farms Support Payments Program)
PROCEDE	Programa Nacional de Certificación de Derechos Ejidales y Solares Urbanos (National Certification Program of Ejido Rights and Urban Lots)
PROCYMAF	Proyecto de Conservación y Manejo Sustentable de Recursos Forestales (Conservation and Sustainable Management of Forest Resources Project)
PRODEFOR	Programa de Desarrollo Forestal (Forest Development Program)
PROGRESA	Programa de Educación Salud y Alimentación (Program for Education Health and Food)
PRONASOL	Programa Nacional de Solidaridad (National Solidarity Program)
RAN	Registro Agrario Nacional (National Agrarian Registry)
SAGARPA	Secretaría de Agricultura, Ganadería, Desarrollo Rural, Pesca y Alimentación (Secretariat of Agriculture, Livestock, Rural Development, Fishery and Food)
SEDESOL	Secretaría de Desarrollo Social (Secretariat of Social Development)
SEMARNAP	Secretaría de Medio Ambiente, Recursos Naturales y Pesca (Secretariat of Environment, Natural Resources and Fishery)
SRA	Secretaría de Reforma Agraria (Secretariat of Agrarian Reform)
TAU	Tribunales Agrarios Unitarios (Unitarian Agrarian Tribunals)
TSA	Tribunal Superior Agrario (Superior Agrarian Tribunal)

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MEXICO:

Land Policy a Decade after the *Ejido* Reforms

Table of Contents

Executive Summary.....	v
1. Introduction	1
2. The <i>ejido</i> as part of the rural sector	2
Characteristics of the rural sector.....	2
Macro-economic reforms	4
Rural poverty.....	5
Forest policy and environmental issues	6
Performance of rural output and factor markets.....	7
Programs to assist in managing the transition.....	9
ALIANZA PARA EL CAMPO.....	10
ASERCA (<i>Apoyos y Servicios a la Comercialización Agropecuaria</i>)	11
SEDESOL (<i>Secretaria Desarrollo Social</i>).....	12
Programs in the Forestry Sector	12
The social sector.....	13
“Agricultural” <i>ejidos</i>	14
Natural resource rich <i>ejidos</i>	16
Peri-urban <i>ejidos</i>	18
3. The 1992 reforms: main accomplishments and institutional challenges ahead.....	19
Legal and institutional changes	19
Legal basis and implementation structure of PROCEDE	21
Accomplishments thus far	24
Institutional arrangements.....	27
Major institutions and overall budgets	27
The <i>Secretaría de Reforma Agraria</i>	28
The <i>Procuraduría Agraria</i>	29
The <i>Registro Agrario Nacional</i>	30
The Agrarian Courts (<i>Tribunales Agrarios Unitarios and Tribunal Superior Agrario</i>)	31
Corett and PISO (<i>Comision para la Regularizacion de la Tenencia de la Tierra, Programa de Incorporación del Suelo Social al Desarrollo Urbano</i>).....	32
National Trust Fund for the Development of the Ejidos (FIFONAFE).....	33
4. Impact of the legal changes of 1992 and PROCEDE.....	34
Data sources and methodology	35
Determinants of PROCEDE implementation.....	37
Impact of legal reforms and PROCEDE implementation on factor markets	38
Land rental markets	38
Land sales markets	43
Credit access.....	44
Welfare impact, and costs and benefits of the program	46
Access to and use of natural resources	49
5. Policy conclusions.....	52
Policy matrix	52
Summary of key issues and recommendations	54

Tables

1	Public sector expenditures for selected rural programs.....	10
2	Share of households with income below one minimum salary in <i>ejidos</i> and the general population, Mexico, 1990.....	14
3	Comparing the private and the <i>ejido</i> sectors.....	15
4	Productive characteristics of certified <i>ejidos</i> , 2000.....	15
5	Use of common property resources by <i>ejidatarios</i> 1994 and 1997.....	16
6	Subjective perceptions regarding the impact of PROCEDE.....	25
7	Mexico: Current budgets of Agrarian Institutions 1995-2000.....	27
8	Characteristics of <i>ejidatarios</i> and private farmers included in the survey.....	35
9	Determinants of PROCEDE adoption.....	36
10	Land market participation by <i>ejidatarios</i> and private farmers.....	39
11	Determinants of operated land and land rental market participation.....	40
12	Determinants of net land purchases, 1984-1992 vs. 1992-2000.....	42
13	Access to credit markets by <i>ejidatarios</i> and private farmers.....	44
14	Access to credit before and after 1992.....	45
15	Welfare impact of PROCEDE.....	46
16	Determinants of common land access, 1994 and 1997.....	48

Figures

1	PROCEDE Implementation Process.....	22
2	Advances in PROCEDE implementation, Dec. 31, 2000.....	24

References.....	57
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MEXICO:

Land Policy - a Decade after the *Ejido* Reforms

Executive summary

During the past decade, Mexico has undertaken major efforts to transform its rural and agricultural sector, and in particular its *ejidos*, from what seemed like a bastion of social and economic backwardness into an integral component of a more dynamic economic environment. The far-reaching institutional and policy reforms undertaken in this context were by no means uncontroversial: Protagonists saw them as an essential measure to improve the functioning of rural factor markets, increase investment incentives and improve governance and the rule of law in the countryside. Opponents, on the other hand, feared that the reforms would lead to the disappearance of long-established social structures in the countryside, re-concentration of land through speculation by exploitative landlords, and possibly even social unrest. This study aims to assess the extent to which the reforms have actually been implemented, the impact they have had on the rural population, and the challenges which, as a consequence, need to be addressed by the new administration.

Background

From the 1917 revolution until 1992, Mexico has implemented a large scale, though slow, process of land reform. It distributed more than 100 million hectares, or 50 percent of the arable area, from large farms to the so-called “social sector”, households organized in *ejidos*, rural communities modeled after a mixture of soviet-style collectives and pre-colonial indigenous social structures. However, a continuing mandate for land redistribution undermined the security of property rights, legal provisions that made usufruct of *ejido* lands conditional on self-cultivation limited rental markets while centralized intervention by the state in day-to day governance of the *ejido* decreased local governance and responsibility. As a consequence, *ejidos* became synonymous with backwardness and poverty up to a point where living in an *ejido* was estimated to increase the probability of a household being in extreme poverty (Velez 1992). There were three main shortcomings associated with this system:

- The limitations on functioning of land markets led to a situation whereby a lot of old people were unable to make efficient use of their land while young households next to the *ejido* suffered from significant land shortages or highly insecure tenure.
- Restrictions on land transfers in *ejidos* also created a formidable obstacle to an effective and efficient process of urban expansion, an issue that is significant in view of the fact that, out of a total of 150,000 hectares used for urban development between 1995 and 2000, more than two thirds (105,000 hectares) were from the social sector, a trend that is expected to continue in the future. The fact that the main avenue for local governments to get access to this land was via expropriation provided perverse incentives to *ejidatarios*, contributing to uncontrolled expansion of informal settlements, with negative consequences.
- As a consequence of the legal and administrative restrictions, *ejidos* were characterized by disproportionately low levels of investment, often unsustainable resource use, and high levels of poverty. Both the 1992 Agricultural and Ejido Census as well as a survey of *ejidatarios* and private producers in 2000 found that the average capital endowment in *ejidos* is significantly lower than what is owned by neighboring private producers (PA 2000).

The 1992 reforms focused on modifications of the legal environment, institutional changes, and the implementation of a program of land regularization. Three main changes were undertaken in the *legal* area:

- A first element was to strengthen self-governance of the *ejido* in a way that allowed it to choose, among others, its property rights regime. In addition to defining *ejido* organs and setting an overall procedural framework, the law explicitly recognized the legal personality of *ejidos* and the ability of the assembly to autonomously regulate internal matters and to decide, among others, to enter into contracts, including the formation of joint ventures (*sociedades mercantiles y civiles*), on whether lands owned by its members are to be held under communal or individual ownership, and whether *ejido* members have the possibility of making the transition towards fully individual property rights (*dominio pleno*).
- A second set of changes was the replacement of the wholesale ban on the ability to exchange land with a more nuanced set of regulations. Land rental was freed completely while sales were allowed within the *ejido* but not (unless the assembly had decided on adoption of *dominio pleno*) with outsiders.
- Finally, the President's power (or obligation) to grant lands was eliminated and the administration of agrarian justice was separated from the executive and vested with an independent system of agrarian justice. This coincided with the declaration of the end of land redistribution (the "*reparto agrario*") and the establishment of a clear set of rules, including compensation, for expropriation.

Institutional changes focused on three areas:

- To allow effective and accessible agrarian justice, a system of 42 *Tribunales Unitarios Agrarios* as well as an appeals court, the *Tribunal Superior Agrario*, were created.
- To allow independent verification of property rights, a special registry (*Registro Agrario Nacional*; *RAN*), with delegations in each of the states, was created. Within the context of *PROCEDE*, the *RAN* issues *certificados de derechos parcelarios* to specific parcels, *certificados de derechos sobre tierras de uso comun* which document a households' proportional share of common use lands (in case the assembly has decided in favor of common use), and *titulos de propiedad de solares urbanos* for urban plots as well as titles of *dominio pleno* which are subsequently inscribed in the public registry.
- Since small farmers who had been under the tutelage of local authorities for a prolonged period of time would still find it difficult to ascertain their rights – especially insofar as past irregularities were concerned- the *Procuraduria Agraria* was created. Its two main functions are to supervise that due process is followed in applying the procedures outlined in the new law; and to fulfill an ombudsman function in which it is charged to actively represent and defend *ejidatarios*, *comuneros* and other agrarian subjects such as small land owners, *ejidos*, *comunidades*, *avecindados*, and agricultural wage laborers. To fulfill this function effectively, a civil service structure that provides paralegal assistance (*visitadores*) and lawyers to the social sector was established.

Land regularization program: All of these elements fed into a demand-driven program of land regularization (*PROCEDE*; *Programa Nacional de Certificacion de Derechos Ejidales y Titulacion de Solares Urbanos*), the purpose of which was to resolve boundary conflicts, regularize land tenure, and issue property rights certificates to members of the *ejidos*. This program, which was started in 1993, allows *ejidatarios* to choose their property rights regime, delineates *ejido* boundaries, measures individual plots, and eventually issues certificates to individually owned plots (including house plots) as well as communally managed lands to each individual. A number of procedural safeguards (such as minimum lead times and quorums for meetings and supervision of assemblies by independent lawyers and the *Procuraduria Agraria*) have been put in place to minimize the risks of political maneuvering, in addition to the fact that any *ejido* member who feels cheated can apply to the agrarian court.

Policy issues to be addressed by this study

What were the economic and non-economic benefits generated by the program? While a number of studies have highlighted that *PROCEDE* did have an impact on the performance of markets in certified

ejidos, it is not known what the program's impact has been on household welfare, environmental management, and no measurement of other benefits has been attempted. This would be critical not only for justifying the program *ex post* but also for deciding whether and in what form to move ahead towards the completion of the program. We answer this by using panel data from 1994 and 1997 to estimate the impact of PROCEDE on farm as well as non-farm income, something that can be compared to an estimate of overall program cost. Furthermore, we aim to identify environmental and other benefits arising from the intervention.

Is there need to continue and/or modify the program? Even if the overall program is well-justified, systematic differences between *ejidos* that had undergone the program in the past and those that remain to be certified would imply that new modalities for program implementation need to be developed. Using 1994 and 1997 data for roughly 250 *ejidos* to estimate an equation for PROCEDE adoption, we highlight *ejido* characteristics that determine program participation and use these to determine systematic differences between adopters and non-adopters that will be of relevance in attempts to complete the program.

What is needed to ensure the sustainability of what has been generated? It has repeatedly been noted that, unless specific measures are taken to ensure maintenance and updating of the registry information generated through PROCEDE, informal land transactions will soon erode the value of the information and the certificates generated through the process. Studies undertaken by the PA as well as case study evidence help to identifying key obstacles to updating of registry information, the transaction costs of doing so, and the incentives that exist at the institutional level.

What are the next steps after completion of PROCEDE? We are interested to know to what extent the reforms undertaken have helped to bring the social sector to a level of productive development and investment that is comparable to private farmers or whether additional administrative or other obstacles remain that might preclude the evolution of this sector in a way that maximizes productivity and household welfare. One issue in this context would be whether there is need to reduce the transaction costs currently associated with transition towards fully private land ownership (i.e. adoption of the *dominio pleno*).

What are the implications for the institutional structure? The institutions in the social sector were implicitly or explicitly geared towards the implementation of PROCEDE. It is useful to review not only how they have been able to fulfill these roles, but also to highlight to what extent proposed shifts in policy or proposed changes in the design or implementation of PROCEDE might require changes in the institutional structure.

Key results and policy recommendations

To answer the questions raised above, we draw on a number of background studies and surveys that were undertaken by the Mexican Government (including land rental arrangements, use of common property resources, the role and status of women in the social sector, and the status of *avecindados* and *posesionarios*) undertaken by the Agrarian Sector over the 1997-2000 period; a panel survey of 1296 *ejido* households undertaken in 1994 and 1997; as well as a survey plus case studies of about 500 *ejidatarios* and private farmers undertaken in 2000. This material allows to draw the following conclusions:

Economic and non-economic benefits: The legal and institutional changes, together with PROCEDE, have generated large economic and non-economic benefits, in a number of aspects:

- Equity through increased land access: In addition to covering an area more than 50 mn has (double the size of Spain) and issuing certificates to more than 3 million households, the program has resulted in the award of secure land rights through formal recognition of occupancy rights for more than 1 million households (*avecindados* and *posesionarios*) who previously did not have property rights. This implies a significant increase in assets for those affected.

- Conflict resolution and social peace in rural areas: About 350,000 land conflicts, many of which dating from before 1992 and constituting a time bomb that could threaten social stability in the countryside, were dealt by the Agrarian Courts. The PA participated in over 126,000 court hearings and mediated outside of court in over 175,000 cases. These services are available to agrarian subjects irrespectively of whether or not they participate in PROCEDURE, but more than one quarter of *ejidatarios* surveyed in 1997 indicate that as a result of this program they now have more secure land tenure with slightly less affirming that PROCEDURE has increased social unity within the *ejido*.
- Improved governance and transparency at the grassroots level: Virtually all *ejidos* have now written internal by-laws, as well as books that can be scrutinized by their members, resulting in greatly increased transparency. In addition, *ejidatarios* in regularized *ejidos* can obtain independent confirmation of their land rights directly from the RAN rather than having to go through political channels as was the case earlier.
- Improved access to common property resources: Panel analysis indicates that, presumably as a result of the award of land certificates and adoption of internal decision-making structures, in *ejidos* that have adopted PROCEDURE, households' ability to access common lands (*tierras de uso comun*) for pasture has increased. Neither gathering of forest products nor logging have been affected by the program.
- Increase in household welfare: Use of the panel data also highlights that PROCEDURE has increased household welfare, predominantly by allowing participation in off-farm labor markets. Comparing the magnitude of the estimated benefits to the costs of the program suggests that, even though the latter were not inconsequential, the program can be justified even on economic grounds.
- Improved functioning of land markets: The analysis indicates that PROCEDURE has laid the basis for better functioning of rural factor markets, especially those for land rental. At the same time, and contrary to what was feared by opponents of the changes and of PROCEDURE, there has not been a wave of land sales as a consequence of the program. On the other hand, there is also no appreciable increase in credit availability to *ejidos* that underwent the program.

All of these suggest that, as long as there is no reason to believe that in the remaining *ejidos* the benefits will be substantially lower than in those that already participated in the program, there is a strong case for completing PROCEDURE. It is recommended, to elaborate a more specific time plan and consider establishment of a sunset clause for the free provision of the program, say, at the end of the current administration.

Nature of program participation: We find that boundary conflicts, illiteracy, large size, internal inequality of land access within the *ejido*, and economic backwardness, are the main reasons for non-adoption of PROCEDURE. This implies that in order to successfully complete the program, the capacity for conflict resolution, especially through alternative mechanisms and out-of court settlements, needs to be strengthened, and that opportunities for reducing the costs of the program need to be sought. One option would be to have a survey of the nature of boundary conflicts, the value of the conflicts, and the scope of resolving them, before moving ahead with the program. Better awareness of the nature of the conflicts will provide information that can be used to adapt the program and allow a smoother implementation. There are two groups of *ejidos* where this problem is of particular relevance.

One class of *ejidos* where the program has advanced much slower than expected are agriculturally "marginal" ones that rely largely on natural resources. In these cases, it will be necessary not only to explore measures for reducing the cost of program implementation, but also to include a stronger component to develop social capital, defined as sustainable community institutions, and to establish internal arrangements for decentralized management and sustainable exploitation of these natural resources in order to increase the usefulness of the program.

A second group of *ejidos* where, surprisingly, the program has either made less progress than was expected or not led to a satisfactory resolution of the issues it was meant to address are those in peri-urban areas. As about two thirds of the land that will, in the foreseeable future, be needed for urban expansion, will come from *ejidos*, this is of great relevance for the speed and price at which housing can be supplied to the urban poor. Also, more than 20 percent of *ejidos* in the vicinity of urban settlements are characterized by informal land occupations. The collaboration of different institutions from the social sector under PISO has been quite successful in dealing with this issue. It would be desirable to build on this success, possibly in the form of pilot, to develop forms of fast-tracking PROCEDURE and integrating it into the adoption of either the *dominio pleno* or other forms of entrepreneurial development that would allow to deliver land for peri-urban development.

Sustainability of the information generated: Available evidence suggests that three issues either increase the cost of updating registry information or reduce *ejidatarios'* incentives for doing so:

- The continuing prohibition of subdivision of land upon inheritance discourages registration and at the same time greatly increases the load of cases that need to be resolved either by the *tribunales* or the PA. Indeed, anecdotal evidence suggests that about 60 percent of the cases that have to be dealt with by the PA are related to inheritance. If rental markets are allowed to operate and, as ascertained in the study, function relatively well, it is difficult to justify the continuation of this prohibition. Abandoning it in favor of the civil law to regulate inheritances is thus recommended.
- Lack of incentives for actualizing information at the local level, together with a centralized operation of the registry and limited sharing of data with local governments, appears to be a main reason underlying the inability to keep the registry up to date. The SRA should increase incentives for maintenance of registry information within the *ejido*, explore the scope for decentralization of the RAN and a closer link (or possibly even a merger) with the *registros publicos* at the state level, and expand information sharing with other institutions and local governments.
- The fear that information gathered during the implementation of PROCEDURE may be used for taxation purposes, implying that the exemption of social land from taxation will eventually be reversed, emerges as a main motivation for *ejidatarios* to reject the program, to not keep registry information current, or to fail to take the final steps towards full private ownership (*dominio pleno*). To demonstrate that such fears are unsubstantiated, it is necessary to review the issue of land taxation with the aim of removing distortions in the system and ensuring that the actual contributions by the private and the social sector are equal.

Next steps after the completion of PROCEDURE: Our study indicates that land markets in *ejidos* that have undergone PROCEDURE function reasonably well, possibly even better than in the private sector. At the same time, there is strong evidence that *ejidatarios* remain severely credit constrained, implying that the award of certificates and titles did not increase credit supply. Further interventions should thus focus on improving investment and management skills, something where *ejidos* still appear to lag the private sector.

- The scope for establishment of joint ventures has not been realized for a variety of reasons, including lack of familiarity with the applicable laws and collective action problems on the part of *ejidatarios* and private investors. Dissemination of models of organization that have proven to be successful elsewhere could help to increase the scope for utilization of this instrument in peri-urban, agricultural, and natural-resource rich *ejidos*. This might be combined with the establishment of channels that can provide technical assistance and possibly even venture capital to help facilitate the process..
- It is important to note that the legal and institutional changes have not led to a wave of land sales and dispossession of large part of the social sector. At the same time, land rental markets remain of a short term nature and the process for adoption of *dominio pleno* remains cumbersome and complicated. To improve upon this, it is recommended to explore, possibly on a pilot basis, mechanisms for fast-

tracking of the *dominio pleno* in peri-urban areas with high land values. Also, in view of the fact that many of the existing subsidies do not encourage longer-term investment, the scope for re-directing some of the fund towards a program that provides incentives for long-term contracts should be explored.

Institutional implications: Both the completion of PROCEDE and the development of a broader and more integrated vision for the social sector pose challenges and opportunities for the institutions involved.

- As the lead agency of the sector, the SRA should develop a master plan for finalizing PROCEDE, modifying the character of the program as needed, and increase its emphasis on providing a lead on formulation and coordination of policy issues. This would include collaboration with other institutions to design (pilot) measures that would help to increase the productive potential of the social sector along the directions outlined earlier. In addition, there is an urgent need to assess the impact of the various programs within and outside the social sector.
- PA and *Tribunales* have made a major contribution to maintaining social peace and increasing accountability in rural areas. Conflict resolution will be of increasing importance in any effort to complete PROCEDE. Some of the additional responsibilities (e.g. the coordination of PROCEDE) taken on by the PA may detract from its ability to devote full attention to conflict resolution and should therefore be dropped. In addition, the scope for increasing the share of funds devoted to conflict resolution should be considered.
- Even though the operation of PISO has helped to make considerable advances in the development of peri-urban lands, a continuing pressure of urbanization and the associated demand for affordable housing, together with the fact that more than 50 percent of the lands in question are still acquired through expropriation, implies that further steps to build on these accomplishments will be needed. In view of the high value of the lands involved, pilot activities in this area might have a particularly high payoff.

Conclusion

In addition to the non-economic and environmental benefits generated by PROCEDE, the legal and institutional changes made in 1992 have had a significant impact. To ensure realization of such benefits in peri-urban areas and in natural resource-rich *ejidos*, some adjustments in program scope, design, and implementation, as well as the legal environment will be needed. Moving ahead in this direction should help to put the social sector on an equal basis to private producers and thus make a positive contribution to a large part of some of Mexico's poorest groups.

1. Introduction

Purpose. This study aims to assess land policy in the broader context of rural development efforts in Mexico. When the last Government took power, the main goal was to provide the structural foundations for making the sector more responsive to economic incentives. Specifically, even though the three functions of the *Secretaria de Reforma Agraria* (SRA) were to coordinate the sector, to improve property rights, and to advance agrarian development, almost all efforts have been concentrated on implementing an ambitious program of land regularization (PROCEDE). With considerable advances made in this respect, and to determine the course to be taken by the different institutions, it will be critical to examine not only the impact of the program but also the extent to which the SRA has been able to develop a broader vision for the future of the rural sector.

Such an assessment would be particularly timely with the recognition of the fact that the social sector will have an essential role to play in three important areas, namely (i) sustainable management of the wealth of natural resources under *ejidos* and communities; (ii) the key role of *ejido* land for peri-urban development and a steady supply of low-cost and affordable housing; and (iii) the promotion of an agricultural sector that can provide sustainable livelihoods in an era of increasingly open and integrated international markets. All of these challenges imply that it will be important to examine the extent to which the institutional structure of the sector is still adequate, the determinants of *ejido* participation in PROCEDE and its impact on household welfare as well as the functioning of rural factor markets, and the newly emerging challenges not only to the social sector but to the rural economy as a whole. Such a review, and the associated recommendations for future actions, will be particularly opportune as sharply reduced budgetary and human resources available to the SRA require a focus on key objectives that would integrate into the Government's broader rural development agenda.

Section one describes Mexico's rural economy, arguing that the *ejido* sector is critical to Mexico's fight to reduce rural poverty and to manage natural resources in a sustainable fashion. It reviews the broad context of macro, trade and sector-level reforms, the strengths and weaknesses of both the productive and socio-economic structure of agriculture and the social sector, highlighting in particular the socio-economic and natural resource characteristics that make the *ejido* sector central to Mexico's development. The section reviews the range of programs aimed to facilitate the rural sector's adjustment to the changed incentive framework, and the evidence that is available on their impact. It concludes that, even though there have been a number of programs aiming to transfer resources and facilitate investment, these programs have had limited success in addressing imperfections in factor and output markets that characterize Mexico's rural sector, and more structural reforms would be needed to remedy these shortcomings.

Section two describes the rationale behind the 1992 legal reforms, including the revision of Article 27 of the Mexican constitution, that were intended to end almost a century of politically motivated interventions in the internal structure of the *ejido* and, by giving more secure property rights and a choice between different property rights regimes to *ejidatarios*, improve the functioning of land and labor markets in the social sector. Against the background of the pre-1992 productive performance, we review the way in which these reforms were implemented, the procedural safeguards adopted to prevent abuse, and the advances, both in terms of numbers as well as impact, made in implementing them, and new challenges that have emerged to the sustainability of these measures. This provides the background for a more detailed description of the Government institutions involved in the sector, their functions, and a discussion of the extent to which the structure remains appropriate to deal with present and future needs of agrarian subjects.

Section three is devoted to a more detailed assessment of PROCEDE and its impact on the functioning of land rental and sales markets, *ejidatarios'* access to credit, and investment. Using evidence on program

performance to identify strengths and weaknesses allows to highlight specific measures that might need to be undertaken to maximize the desired impact on productivity and household welfare. Contrary to earlier studies which have all focused on the *ejido* sector, the chapter aims to undertake a comparison between the social and the private sector. Qualitative evidence indicates that the program has led to a significant reduction in the incidence of conflicts, greater participation in markets, and better internal organization at the community level. Far from being associated with a wave of sales, we do not find evidence for increased land sales market activity following adoption of PROCEDE, but neither is there a strong credit supply effect. The program has not only established the basis for better functioning of rural factor markets, but also contributed to an improvement in household welfare. At the same time, the fact that incorporation of *ejidos* in the program was non-random implies that, in extrapolating the benefits from extension of the program, appropriate adjustments will need to be made.

Section four sums up policy recommendations in six key areas namely (i) land policy; (ii) completion of PROCEDE; (iii) ensuring the sustainability of the advances made under PROCEDE; (iv) productive development of the social sector; (v) land market activation; and (vi) peri-urban development.

2. *The ejido as part of the rural sector*

In this section we introduce the *ejido* sector as part of the overall rural environment and highlight some of the changes it confronts. We start by highlighting the general characteristics of the rural sector, and the macro-economic reforms that were expected to address these deficiencies. This leads to a brief discussion of rural poverty and environmental sustainability, and the extent to which the reforms have managed to improve the functioning of rural factor markets. We discuss main compensatory programs, i.e. *Procampo*, *Alianza*, *Aserca*, and *Sedesol* as well as programs in the natural resource sector that were designed to ease the transition towards a competitive environment and the extent to which they have been effective in contributing to this goal. This sets the scene for a more detailed description of the *ejido* sector where we distinguish between three types of *ejidos*, those that have a potential for agricultural production comparable to the private sector, those with large amounts of common lands where sustainable resource management is of high importance, and those in the peri-urban fringe where efficient mechanisms for incorporation into the urban growth process are of paramount importance. In addition to providing prima facie evidence on the relative importance of different categories of *ejidos*, the description of the general rural environment and the different types of *ejidos* sets the stage for a more detailed consideration of the design and impact of the 1992 legal reforms in the next section.

2.1 *Characteristics of the rural sector*

An inward oriented agricultural sector in an urbanized economy: Mexico is highly urbanized but the socio-economic development of the approximately 25 percent of its 100 million inhabitants who remain in rural areas is of critical importance for socially and environmentally sustainable economic development. Agriculture, livestock and forestry sector contributes 5 percent of GDP by 1999, of which 70 percent comes from agriculture. It is 75 percent rainfed, and 25 percent irrigated. In terms of land use, the major uses are (a) agriculture occupying nearly 13 percent of total area, (b) livestock 55 percent, and (c) forestry, 23 percent. Within agriculture, annual cultivation dominates accounting for roughly 85 percent of total. Grains — maize, beans, wheat, and sorghum — occupy 80 percent of cultivated acreage. Maize alone occupies 50 percent of total cultivated acreage.¹ Much of the sector is characterized by low value crops and by low labor productivity as the wide divergence between the sector's contribution to GDP and its contribution to labor force attests: 5 versus 20 percent.

High levels of differentiation. The rural sector is characterized not only by its high incidence of poverty, but also its dualism and differentiation. Broadly speaking, there is a minority of commercial and globally

¹ Source: *Mercado y Comercialización de Granos en México* por Jose Tulais, 2000; pp 5-6, 10-11, 12-13.

competitive large farmers, and a majority of import-substituting and subsistence-oriented small farmers. Within this group, there are those in areas of high agricultural potential and those in marginal areas of low agricultural potential.

Commercial farmers and rural entrepreneurs. They represent a minority of commercial farmers and rural entrepreneurs, mostly driven by the export market. These are among the 2.6 percent of private farmers who own roughly 28 percent of private land. They are technologically advanced and competitive in global markets. In agriculture, private insurance companies deal with them only (not the two riskier categories below). These companies operate mainly in Central Mexico.² Their success shows the substantial productivity potential that exists in agriculture. It also shows that the possibility to access output markets, factor markets, technology and credit, has often been more important than being large or small.

Smallholders of low productivity. This group mostly produces for the local market or for subsistence. Those that live in areas of substantial agricultural and rural non-farm (RNF) potential can be made more productive by enabling them to diversify into higher value crops or into activities facing expanding demand, services, transformation, and off-farm activities. Currently, AGROASEMEX, the parastatal crop insurance company (operating mainly in the north and south), and the *Fondos* (operating mainly in northwest) provide them with crop and calamity insurance respectively. They are too risky for the private companies. Agriculture productivity combined with a better functioning of markets (output, land, labor, financial) will be the key challenge for this group. Technical assistance is often unavailable, partly due to the reduction of public funds in the course of the 1990/91 policy reforms.

The severely marginalized. These are the landless farm workers and those that live in areas of low agricultural potential (risk-prone or marginal agriculture, often high altitude, forested and watershed areas). This group is too risky for any crop insurance, including public. This group also has limited off-farm opportunities and often represents the extreme poor. While their agricultural productivity can be improved through better techniques for their specific cropping patterns (mostly non-tradable, coffee and small livestock), natural resource, market and infrastructure limitations require greater reliance on social safety nets as part of a survival strategy.

Major challenges: The rural sector is important for a number of reasons. First, in view of pervasive credit constraints and wide differences in households' ability to access productive resources, the response to the liberalization of the early 1990s has been highly differentiated. While those with good access to infrastructure and water had been able to take advantage of new export opportunities, small rainfed farmers who had grown traditional crops for internal consumption are often unable to switch to higher value crops due to inability to access credit, lack of access to technology or marketing and storage infrastructure. They therefore found themselves flooded by cheap imports from the North, against which it was often difficult to compete. Second, the incidence of rural poverty is, with 85 percent in 1996, much higher than in urban areas (47 percent).³ The large inequality in access to economically productive resources and assets brings the danger of a further widening of the gap between rich and poor, with all the associated negative consequences. Third, Mexico's rural sector is home not only to a wealth of biodiversity but also to a large indigenous population. The lack of access to infrastructure and productive resources that is characteristic of the small farm sector is, in the case of indigenous people, exacerbated by a different language, even greater remoteness, and often very unproductive soils. As limitations of space and time prevent us from dealing in detail with the problems faced by indigenous population, this is very much an issue that might be worth further study, especially in view of pending legal initiatives to provide greater recognition to indigenous land rights.

² Source: Mexico: Crop insurance, draft March 2001 report, by Panos Varangis et al, para 45, 47.

³ Source: Government programs and poverty in Mexico, in two volumes, report no. 19214-ME, Green cover, November 10, 1999, World Bank; vol. 1, Table 1.1. The "projections" for 1998 are 77 and 47 percent respectively (for the moderate poverty line). Thus, the incidence of rural and urban poverty has decreased, but the rural incidence is still much higher than the urban incidence.

2.2 Macro-economic reforms

Sweeping reforms to realize the productive potential: Even though Mexico has, especially in areas where irrigation is available, considerable agricultural potential, Mexico's agricultural sector has traditionally been inward-looking, hampered by exchange rates policies, and focused production of low-valued staples primarily for subsistence and implied serious lack of international competitiveness. All of these were compounded by an inefficient marketing structure. To overcome these disincentives, increase investment and improve productive performance, the country has, since the mid 1980s, been undertaking major reforms in the domestic food economy, at the macro and the sectoral level. The intention was to go from a centralized and controlled system to a largely liberalized and private-sector driven economy. As a result, agriculture has been increasingly exposed to competing imports, e.g., maize and wheat. Key measures were the following:

Pan territorial guaranteed prices for twelve crops, including wheat, sorghum, barley, rice, and oilseeds were eliminated in the early 1990s, leaving only agreement prices⁴. Subsidies for inputs such as seeds, fertilizer, pesticides, machinery and diesel fuel, but not a subsidy on electricity for groundwater extraction, were dismantled. Price subsidies on maize and beans were gradually phased out. Floor prices for maize and beans were established in 1995 and the maize market was liberalized in 1999. At the same time, major steps were taken to reduce subsidies for consumers. The tortilla subsidy was phased out and CONAPSUPO was eliminated in 1995. The form of the subsidies changed but the share of the maize market affected by the subsidies changed little from the period of CONASUPO in which government intervention in the markets was explicit. The government continued to provide large marketing subsidies, funneled through ASERCA (see the discussion below) for about 2.6 million tons of maize in 1999. Before 1990, agricultural imports and exports were generally subject to quantitative restrictions. NAFTA was implemented in January 1994. In this context, these restrictions were eliminated or converted into tariff equivalents that are progressively being reduced to tally by no later than 2008.

Gainers and losers from liberalization. The shift towards a more export-friendly incentive structure was not without effect. Commercial exporters of high value fruits and vegetables gained from liberalization and improved access to United States markets. Agricultural exports to the United States grew by roughly 80 percent during the first six years following NAFTA.⁵ At the same time, in view of the structural obstacles faced and exacerbated by the financial crisis in the mid 1990s, few of the smaller producers in less favored environments were able to make the shift to highly commercialized production. Agriculture remained dominated by import substitutes such as maize which continues to occupy more than 50 percent of cultivated land. Overall the sector was characterized by mediocre performance. This suggests that "second generation" reforms to improve the functioning of rural markets will be needed to enable broader participation by the small-holder sector in the opportunities opened up by the liberalized environment.

Erratic agricultural growth: At the same time, the broad majority of producers in the agricultural sector, which had been extremely inward-oriented before the 1992 reforms, was, during a period of financial crisis, unable to make the shift towards more remunerable crops and suffered greatly from competition by cheap imports, while the small export-oriented commercial farming sector performed very well. Cropping patterns have barely changed throughout the 1990s.. Annual growth (including livestock, forestry, and fisheries) improved to 3.5 in percent in 1999 and 3.4 percent in 2000.⁶ As a consequence, growth rates were erratic, fluctuating between 1 to 4 percent, and overall the sector stagnated.⁷ The *ejido* sector in particular fared poorly, although it is being increasingly integrated in the rural non-farm economy. Given the prevalence of import substitutes cultivated mainly under low productivity conditions,

⁴ Agreement prices are prices agreed upon by producers, Aserca, and State representatives as remunerative prices. In determining the commercialization subsidy for a given grain, Aserca computes the difference between the reference price and the agreed price. The reference price is defined as the price of the grain at the border plus transportation costs to the consuming area.

⁵ Source: Mexico: Rural development and agriculture, Policy note, October 5, 2000, the World Bank, pp 3-4.

⁶ Source: *Estadística Básica, Centro de Estadística Agropecuario, SAGAR, Producto Interno Bruto del Sector Primario, Producto Interno Bruto Trimestral por Sector Económico, 1994 -I 2000, a precios de 1993.*

⁷ Source: Mexico: Rural development and agriculture—a Policy Note, World Bank, October 2000; figure on growth rates, pp 3.

it is not surprising that Mexico's ratio of agricultural exports to agricultural GDP is one of the lowest in Latin America (46 percent in 1996).⁸ Agricultural exports as a percentage of total exports have declined from 5 percent in 1989 to 3.2 percent in 1998; for agricultural imports as a percentage of total imports, the respective percentages are 5.8 percent and 3.8 percent. Its main exports are coffee, a smallholder crop, and fruits, vegetables, mainly from large farmers. The balance of agricultural trade over the last decade or so (1989-98) has been primarily negative.⁹ Although grains occupy most of the cultivated land, Mexico is a grain deficit country. In 1998, maize constituted 50 percent of grain imports (this goes mainly to the livestock and poultry industry), followed by sorghum (33 percent), wheat (16 percent) and beans.¹⁰

Limited diversification in response to the changed incentive framework: Even though the reforms were intended to improve the incentive framework for the sector, small producers faced increasingly negative incentives: lowering real prices for basic agricultural commodities, which were also highly unstable. Up to 1994, inflation remained high. Prices of competing imports were low until the devaluation of 1994/95, due to the overvalued exchange rate. Border prices for the major commodities, e.g. for import substitutes and for coffee, kept falling except for the brief spike of 1996. Domestic marketing channels remained non-competitive and inefficient, being dominated by monopolies and oligopolies. The high level of interest rates emerging as a consequence of the financial crisis increased the transaction costs of storage, thus lowering further the prices small producers received. As a result, estimated nominal rates of protection (from 1992 to 1997) were negative.¹¹ There is however a minority of competitive commercial farmers which have successfully responded to the expanding market opportunities generated by NAFTA (1994).

2.3 Rural poverty

Poverty and inequality are high. Poverty incidence has decreased towards the end of the 1990s but it is still high. Roughly 58 out of the 100 million Mexicans are poor. At the national level, moderate poverty (those who can pay their basic nutritional needs but not much more) has decreased from nearly 61 percent of total population in 1996 to an estimated 56 percent in 1998.¹² Severe poverty (1996), defined as those who cannot meet their nutritional needs, afflicts nearly one third of the population (or roughly 28 million), with the incidence at 31 percent national, 60 percent for rural and 19 percent for urban.¹³ For 1998, the respective estimates for moderate poverty are 58, 82 and 50 percent; for extreme poverty, they are 25, 56, and 16 percent respectively.¹⁴ Although Mexico is primarily urban (the urban/rural population split is roughly 75:25), rural Mexico contributed to nearly 60 percent of the national headcount index of poverty.¹⁵ Income inequality is high in Mexico: the richest decile commands 44 percent of household expenditures (1996); the poorest decile, only 1 percent.¹⁶ In the late 1990s, there has been an increase in inequality in rural areas, although inequality in urban areas is much higher. The Gini coefficient for income inequality for rural areas rose from 0.448 (1984) to 0.452 (1996) and to 0.480 (1998).¹⁷ The economic crisis of 1995 inflicted a heavy toll on the poor, wiping out much of the gains achieved since the mid-1980s. A survey of major sources of risks for household income among resource-poor farmers shows that illness of the main breadwinner and low demand for their services (wage employment) are

⁸ Source: Mexico: Rural development and agriculture, Policy note, October 5, 2000, the World Bank, pp 4.

⁹ Source: *Mercado y Comercialización de Granos en México* por Jose Tulais, 2000; para 9,10.

¹⁰ Source: Mexico: Food marketing: Grains and perishables, July 12, 2000 draft, World Bank, pp 22-23.

¹¹ Source: Mexico *Ejido Reform: Avenues of Adjustment—Five years later*, decision draft, Main Report, September 7, 1988, World Bank, tables 1 & 2.

¹² Source: Mexico: Rural development and agriculture: a Policy Note, World Bank, 2000, Table 1, based on estimates from INEGI surveys

¹³ Source: Government programs and poverty in Mexico, in two volumes, report no. 19214-ME, Green cover, November 10, 1999, World Bank; vol. 1, Table 1.1, Box 1.1.

¹⁴ Source: Mexico: Country Assistance Strategy Progress Report, World Bank, Draft report no. 00000-MX, April 16, 2001, Table 1.

¹⁵ Source: Government programs and poverty in Mexico, in two volumes, report no. 19214-ME, Green cover, November 10, 1999, World Bank; vol. 1, para 1.3.

¹⁶ Source: Country Assistance Strategy of the World Bank Group for the United States of Mexico, report no. 19289-MX, May 13, 1999, Mexico Country Management Unit, Latin America and the Caribbean region, the World Bank; Box 2.

¹⁷ Source: Mexico: Country Assistance Strategy Progress Report, World Bank, Draft report no. 00000-MX, April 16, 2001, Table 1.

major sources of vulnerability.¹⁸ Growth has not been broad-based enough in the sense that the poor did not benefit sufficiently in terms of improving their human capital - their access to health services, their employment and wage opportunities, and the productivity of their labor. State-level panel data shows that one fourth of the potential gains from growth in terms of poverty reduction was lost due to higher inequality.

A more differentiated view of poverty. The incidence of poverty differs by groups and is particularly high for households with low levels of education. Poverty is higher in agriculture and in construction. Location characteristics alone are important determinants of poverty; e.g., access to services and markets, demand for labor, degree of industry concentration. Size of community also matters. Many small communities (less than 20 households) do not have access to electricity. Access to all services is very poor in these small, isolated communities. The smaller the community, the smaller the likelihood to benefit from any government program. These difficult living conditions are important contributors to rural-urban migration, a major phenomenon in Mexico.

Poverty is particularly high among indigenous peoples. Indigenous peoples who make up roughly 10 percent of the total population (or about 10 million) bear a disproportionately high burden of poverty. For nearly five centuries, the indigenous peoples have suffered destruction, discrimination and marginalization from the non-indigenous segment of the population. Indigenous *ejidos* constitute 20 percent of total *nucleos agrarios* or (*ejidos* and communities), mainly dedicated to subsistence-oriented agriculture.¹⁹ Some sources indicate that today one quarter to one third of Mexico's poor are indigenous and that indigenous peoples make up about 60 percent of the extreme poor.²⁰ Severe poverty incidence in the southern states is high, at 65 percent versus the national level around 30 percent (1996).²¹ In fact, 80 percent of indigenous people are classified as poor!²² Educational attainments are disproportionately low for indigenous children. Health indicators are also low. Indigenous municipalities have three times the incidence of death from intestinal infections and the ten major causes of death are intestinal infections or respiratory illnesses. As among other rural Mexicans, rural-urban migration is high, with Mexico City having the largest indigenous population. Having been left poor soils in rainfed areas—nearly 94 percent of indigenous *ejido* and community lands are non-irrigated, temporary migration is critical for many indigenous peoples as a way to supplement their meager rural incomes.²³

2.4 Forest policy and environmental issues

Forest policy: Mexico is unique in that 70 percent or more of its forest area is within the boundaries of social sector. In fact, between 7,000 and 9,000 *ejidos* and indigenous communities have significant forested areas. Given this unique forest tenure situation, and the fact that Mexico still has large natural productive forests that could be converted to real economic assets for rural development, it would appear that community and *ejido* forestry should be a major point of emphasis in the country's poverty alleviation and forest conservation strategies. As yet, there does not appear to be a clear vision of the potentials and constraints, or concerted attention to this sector. Before the 1990s, Mexican forest policy focused on large-scale timber extraction and processing, providing minimal support to communal forest owners. With the passage of the 1992 forest law, there was a shift to privatized extension services, a more streamlined regulatory framework, and a continuation of the trend away from subsidizing large-scale operations and preparing for trade liberalization in the sector (NAFTA allowed a 15-year period of protection). This trend continued in the 1997 law revisions, but with increased regulation on forest management.

¹⁸ Source: Mexico: Crop insurance, draft March 2001 report, by Panos Varangis et al, table ?

¹⁹ Source: National Profile of Indigenous Peoples of Mexico, World Bank., date (?), Table 7.7: Area Coverage of *Ejidos* and Communities in Mexico, from INEGI, VII Censo Ejidal, 1991. It is a total of 6,298 in a total of 29,983 communities, or 26796 *ejidos*.

²⁰ Source: Indigenous peoples and poverty—Mexico policy note, June 2, 2000, World Bank; pp 2.

²¹ Source: Mexico: Rural Development in Marginal Areas, World Bank, Project Information Document, Project ID MX-7711, November 1997; para 1.

²² Source: Mexico: Rural development and agriculture, Policy note, October 5, 2000, the World Bank, pp 4.

²³ Source: National Profile of Indigenous Peoples of Mexico, World Bank., date (?), para 95-97.

Still, the current regulatory framework is very much based on a command and control approach rather than incentives, and remains unnecessarily detailed and prescriptive. Compliance by landowners is difficult and expensive. This combination of an inflated regulatory burden for forestry and a pro-purchaser set of product standards not only discourages forestry, but puts forestry at a disadvantage to the agricultural sector which, despite substantial environmental costs to poor management, remains relatively unregulated. A market for private extension services has emerged in the 1990s, but because of the high cost of management plans, service providers are under pressure to charge less for their services, requiring them to deliver a lower standard product. The total number of service providers in the country remained fairly small. It is estimated that 65 percent of all *ejidos* may have commercial potential. However, only a small minority (1,800 *ejidos*/communities) has any formal management plans.

Irrigated agriculture has central role but faces challenges. There has been large investment in irrigation infrastructure which was considered a centerpiece of the rural economy. Irrigated agriculture, accounting for 55 percent of total value of production, is of strategic commercial importance, especially after NAFTA, as it contributes to 70 percent of agricultural exports. Recently, great advances have been achieved in terms laying the foundations of sustainable water use through integrated water resources management, by promulgating and implementing the National Water Law (1992 and 1994 respectively). But there are stark imbalances between areas of intense economic activity and areas of water availability. The northern and central region of Mexico generates roughly 84 percent of GDP, contains 77 percent of population, and has 92 percent of irrigated areas. However, it has only 28 percent of the run-off. In the northwestern, northern, and central areas, total withdrawals come dangerously close to natural availability. If current trends continue, many states in these areas will be facing severe water stress.²⁴

Efficiency of water use remains low. Even though agriculture accounts for 80 percent of total water use, irrigation and distribution efficiency is low, with 50 percent of this expensive resource still devoted to low-value cereals, with only 10 percent to high-value fruits and vegetables and oil seeds.²⁵ The competition for water use is increasing with urbanization and industrialization. The competition from North American imports of cheaper wheat and maize will also increase with the 15-year tariff phase-out (by 2008). In 50 percent of Mexico's ground water supply, extraction already exceeds recharge. Contamination from industrial pollutants and over-exploitation threaten the sustainable management of ground water, a strategic resource, putting at risk not only irrigated agriculture but also industry and development at large.

A bio-diversity rich country under stress. Mexico is the country with the highest ecological diversity in Latin America. On its almost 2 million km² of total land area, it harbors more than 10 percent of the biological diversity of our planet, making it one of the 12 *mega*-diverse countries in the world. Mexico is very rich in species diversity, with 24,000 species of flora and fauna, excluding invertebrates and non-vascular plants. It ranks first in the world for diversity of reptile species, second in mammal diversity, and fourth in amphibian and plant diversity. Some 70 percent of its territory is under some form of vegetation, including temperate and tropical forests, arid zone vegetation, aquatic vegetation and degraded areas. However, significant parts of Mexico's biological wealth have been under increasing strain over the last decades.²⁶ Mexico's land and forest base is threatened by land degradation and deforestation, thus reducing cultivable area, increasing the devastation from natural disasters, and threatening water supplies.

2.5 Performance of rural output and factor markets

Inefficient agricultural marketing channels prevail. Inefficient agricultural markets constitute a major obstacle to broad-based agricultural growth. Instead of being attracted by new opportunities, low levels of infrastructure and small quantities of marketable produce implied that, as with liberalization parastatals withdrew from agricultural markets, they often left a vacuum that was subsequently filled by oligopolistic

²⁴ Source: Mexico Water Policy Note, June 2000, World Bank; pp 1-2, incl. Fig 1-2.

²⁵ Source: Mexico Water Policy Note, June 2000, World Bank; pp 3-6, 9.

²⁶ Source: Mexico: A sustainable future—a policy note for Mexico's new administration, by Adolfo Brizzi, May 2000; section 1, para 1.1-1.10.

private intermediaries. High transaction costs, inefficient distribution systems, prevalence of monopolistic and oligopolistic practices characterize the functioning of agriculture markets. For example, maize markets are poorly integrated as a result of limited competition, poorly functioning storage markets, and monopsony power.²⁷ Generally for grains (which account for 40 percent of total value of agricultural production, and 50 percent of total agricultural employment), high marketing margins (high relative to the United States) result from high transportation costs, high financial and storage costs, and concentration among relatively few buyers, particularly in beans.²⁸ The underdeveloped state of marketing infrastructure, and therefore the higher riskiness of operating in these markets, especially in poor and marginal areas, further restricts the transmission of demand which in turn further restricts competition, hence a vicious circle. Horticulture has been a major growth area in Mexican agriculture, rising from 18 percent of agricultural production in 1960-63 to 35 percent in 1996-98.²⁹ However, even in this dynamic fruit and vegetable business, the farmer typically gets no more than 35-45 percent of the retail price of the product as against the 65-75 percent obtained by farmers of Central America, or about 50 percent received in other distorted markets of Latin America.³⁰ These markets for perishables are highly concentrated; e.g., in avocados, 7 main wholesalers at the CEDA-DF; in oranges, 5; in tomatoes, 8.³¹ The dualism in primary production is repeated by market concentration in the handling and marketing stage, thus locking the resource-poor out of lucrative market access.

The potential of labor markets is not realized. In view of the high labor endowments that prevailed before the reform, migration, both national and international, seems to be an important strategy for many *ejidatarios*. Indeed, even though figures are patchy, they point towards a significant increase temporary migration to the United States increased from 3 percent in 1994 to 8 percent (of households) in 1997. At the same time internal migration is reported to have decreased from 10 percent to 7 percent respectively.³² Over the past 5 years, population has grown at an average annual rate of 1.5 percent, and labor force at 3 percent p.a. In a sector where labor is of low productivity and abundant, the potential role of well-functioning labor markets to reduce poverty is substantial. It is often alleged that policy-induced distortions in formal markets such as regulations on firing and hiring of workers, restrictions on labor subcontracting, and limits on temporary contracts raise the cost of labor and thus impede labor absorption, efficient employment and output growth. Although there are no analyses of rural labor markets in Mexico, studies of labor markets elsewhere in the region suggest the following hypotheses about the functioning of rural labor markets in Mexico. For example, subcontractors (*contratistas*) played a key role in the dynamic expansion of Chile's fruit sector in particular, and of its agriculture in general. This spectacular performance of agriculture was preceded by, among other things, labor reform which eliminated employers' obligation to negotiate with sectoral unions representing seasonal workers.³³

Access to rural financial services for low-income households remains problematic. As a consequence of years of subsidized, directed credit through government banks, access to credit remains a major bottleneck for low income rural households seeking to "grow" out of poverty. Lack of financial discipline exacerbated by periodic debt forgiveness resulted in poor recovery of these subsidized, directed programs which benefited the better-off anyway. Rural financial markets have remained shallow, segmented and 'personalized'. Only few lenders operate, and at high costs. Non-bank financial intermediaries (NBFIs) however have been resilient in the face of the mid-1990 financial crisis. But they too are constrained by an inadequate legal, regulatory and supervisory environment. As a result, there is a generalized lack of

²⁷ Source: Mexico—Food marketing in grains and perishables, July 12, 2000 draft, World Bank, by Panayotis Varangis et al, pp 7, Table 25.

²⁸ Source: Mexico—Food marketing in grains and perishables, July 12, 2000 draft, World Bank, by Panayotis Varangis et al, pp 7.

²⁹ Source: Mexico—Food marketing in grains and perishables, July 12, 2000 draft, World Bank, by Panayotis Varangis et al, Table 25.

³⁰ Source: Mexico: Rural development and agriculture—a Policy Note, World Bank, October 2000; pp 7.

³¹ Source: Mexico—Food marketing in grains and perishables, July 12, 2000 draft, World Bank, by Panayotis Varangis et al, Table 2.

³² Source: Mexico Land Reform: Avenues of Adjustment—Five years later. Decision Draft, September 1998, report no. ?, World Bank, Main Volume, para 46-48.

³³ Source: "Wage employment and rural poverty alleviation" by Alejandro Cox Edwards in Rural Poverty in Latin America, edited by Ramon Lopez, professor, Department of Agricultural and Resource Economics, University of Maryland, and Alberto Valdez, Agricultural Advisor, World Bank, Washington. Macmillan Press, UK, St. Martin's Press, US; chapter 5, pp 93-94, 96.

public confidence in these and in the banking sector. This lack of confidence is costly to private individuals, and in developmental terms. The poor do in fact save but in forms that are high-risk and low return. For example, most savings are in the form of highly liquid physical assets such as livestock that suffers high mortality; e.g., 56 percent for chickens and 40 percent for pigs.³⁴ According to the survey, most report that they had difficulty selling the livestock in times of emergency. They still had to borrow and then repay by selling the livestock later. Other important forms are informal lending to friends, etc., and in savings associations. Informal lending has a 20 percent arrears/default rate. *Tandas* (savings societies) report a 6 percent non-compliance rate (members who cease to contribute once they have taken out their share).³⁵ Thus the major forms of savings scored low in terms of liquidity, return, and safety.

2.6 Programs to assist in managing the transition

Overview: It was clear right from the beginning that the transition from a low productivity agriculture to one of high productivity, broad-based growth, and competitiveness, will require not only time but also a reversal of the past trends of under-investment. In recent years (1997), social expenditures to reduce poverty represented 8.5 percent of GDP or nearly 53 percent of government's programmable budget expenditures. These expenditures have increased by nearly 28 percent in the 1995-1999 period, much higher than the nearly 15 percent increase in its programmable budget. More than 90 percent of total spending was, however, on broad-based programs rather than on targeted programs.³⁶ The latter focused on the development of human capital, such as *PROGRESA*; employment and income opportunities, such as productive support from the National Indigenous Institute; and the development of physical capital, such as for drinking water and sanitation in marginalized areas. Below we review the major rural programs to assist small producers better manage the transition to a liberalized and competitive system, *PROCAMPO* (fall/winter 1993-94) and *ALIANZA PARA AL CAMPO* (1996), marketing subsidies through *ASERCA* (1991), and infrastructure subsidies through *SEDESOL*. These were part of GOM strategy to increase agricultural productivity. Another important program that channeled resources to the poorest producers was the *CREDITO A LA PALABRA* administered by *SEDESOL*.

Assessment: While, in general, gross mis-targeting has been avoided, all of these programs are supposed to be transitory rather than permanent and have had limited impact on long-term investment. In the absence of investment in alternative income-earning opportunities, withdrawal of the programs will lead to significant reductions in household income.³⁷ To date, there is no evidence that these programs are igniting an increase in investment among smallholders, essential for re-orientation of the sector. Recent studies of major output markets (grains and perishables) show that they are still subject to policy-induced distortions (less so for perishables), poorly integrated, with high marketing margins and pervasive monopolistic and oligopolistic practices. Lack of farmer cooperatives in marketing remains a major weakness of small farmers. It is therefore important to assess the functioning of output and factor (land and labor) markets to better understand the difficult context within which *ejidatarios* must operate and therefore the challenges that still lie ahead in order to revitalize the *ejido* sector.

2.6.1 PROCAMPO

The *Procampo* program was intended to compensate agricultural producers for the loss of revenue caused by the liberalization of agricultural trade and the removal of price supports in the grain sector, and was conceived from its inception as a 15 year-long program to be phased out by 2008. The program is important both because of the number of producers it reaches as well as for the large expenditures it involves. In 1999, expenses for *PROCAMPO* amounted to about US \$1 billion (or 0.25 percent of GDP),

³⁴ Source: Mexico: Rural finance: Savings mobilization potential and deposit instruments in marginal areas, October 30, 2000, report no. 21286-ME, World Bank; para 210.

³⁵ Source: Mexico: Rural finance: Savings mobilization potential and deposit instruments in marginal areas, October 30, 2000, report no. 21286-ME, World Bank; pp 6-7.

³⁶ Source: Government programs and poverty in Mexico, in two volumes, report no. 19214-ME, Green cover, November 10, 1999, World Bank; vol. 1, chapter II.

³⁷ Note that *Procampo* contributes 8-40 percent of *ejido* household income (de Janvry and Sadoulet 2000).

benefiting some 3.2 million producers (see Table 1). It is estimated that *PROCAMPO* contributed to about 8 percent of *ejidatario* household income, although its contribution may amount to 40 percent for low-income families.³⁸

Table 1 - PUBLIC SECTOR EXPENDITURES FOR SELECTED RURAL PROGRAMS

(Thousands of constant Mexican Pesos, Base Year: 1993)

ITEMS	1997	1998	1999
Productive Programs	10,595.0	9,131.9	9,049.5
<i>Procampo</i>	3,218.3	3,140.5	3,042.1
<i>Apoyos a la Comercializacion</i>	939.5	686.5	499.0
<i>Alianza Para El Campo</i>	672.9	705.3	811.2
<i>Infraestructura Hidroagricola</i>	816.2	821.2	834.5
<i>Procede</i>	347.0	356.8	316.4
<i>Foresry</i>	121.2	53.1	52.0
<i>Others</i> ³⁹	4,480.1	3,368.5	3,494.3

Source: 1997 Cuenta Publica, 1998 Cierre Regularizable, 1999 REF. SHCP

Payment is conditional on plot registration. To receive payment, plots must have been cultivated with either corn, sorghum, wheat, beans, rice, soybeans, cotton, cardamom, or oats in the three crop cycles preceding August 1993. The underlying idea was to partially de-link support from producers' decisions by providing a fixed payment per hectare provided the land was cultivated with one of the eligible crops⁴⁰. While, initially, this has not always been the case, *Procampo* has recently been restructured so as to further break the link between payments and production decisions, at least for smaller farmers below 5 hectares. Small farmers can now obtain the *Procampo* payments at planting time and are not required to plant one of the eligible crops. There is also a cap of 100 hectares beyond which farmers cannot receive payments for cultivated or grazed land, in spite of its eligibility. Payments under the program are supposed to be made before the start of the production cycle to be useful, but delays are reported to be widespread.

There is evidence that farmers who lacked access to credit have used *Procampo* as a guarantee. However, this was used mainly to finance short-term working capital requirements at the beginning of the planting season, or to acquire food and other consumption goods at a moment in which liquidity constraints are tight for resource poor farmers. Thus, the program seems to have made a very limited contribution, if any, to the expansion of a rural system for financial intermediation, and interest rates on this type of credit are believed to have been substantial.

One desirable feature is that *Procampo* eligibility is based on plots rather than the producers' identity, allowing the payment to be transferred with land rentals. Given the administrative hurdles required to prove the rental of the eligible plots, and in view of the traditional informality in contracting land in Mexico, it is common practice that the payment is given to the owner of the plot, rather than to its cultivator. Although originally per hectare payments were expected to be kept constant in real terms, there has been a slight erosion of the value of payments due to inflation.

2.6.2 ALIANZA PARA EL CAMPO

Character: A more specific productivity-increasing impact was expected from a number of programs that were concentrated under a broad umbrella called *Alianza para el Campo*. The purpose of these programs was to transfer modern technology, promote investment in infrastructure, decrease the incidence

³⁸ Source: Mexico *Ejido Reform: Avenues of Adjustment—Five Years Later*, report no. , Main report, World Bank, September 7, 1998; para 93-105.

³⁹ Incluye: SAGAR, Organas y Enidades Coordinadas, Intermediarios Financieros AgropecuariaRam0 11, STPS, PROBeCAT.

⁴⁰ The list of eligible crops was expanded over time in order to provide increased flexibility for the producer.

of animal diseases, and support an integrated development of the rural communities. *Alianza* hosts a great number of sub-programs. The main ones are ferti-irrigation, mechanization, rural equipment, and kilo for kilo. Together, these programs cover over 50 percent of *Alianza*'s budget. After *Procampo*, *Alianza* is the most important effort, from a budgetary point of view, to counter the stagnation of the bulk of the agricultural sector. Resources for the program are from both Federal and State governments. The latter are responsible for the implementation of the program at the local level. Most of the program requires a matching contribution by the beneficiary.

Implementation and access. Several limitations of the program were analyzed by the 1997 *Ejido* Survey. Given that *Alianza* had started one or two production cycles before the *ejido* survey was carried out, the latter was unable to register the longer term effects of the program. Thus, the following results should be read bearing in mind this caveat. First, *ejidatarios* were in some instances required to form groups or associations to participate. This generated transaction costs and coordination failures that resulted in a reduced interest on behalf of the potential beneficiaries. Second, *ejidatarios* were not allowed to participate in the process of selecting the purchases supported by the program. This seems to have reduced the programs' attractiveness. A further consequence of this problem was that the program did not help in strengthening the development of marketing links between input suppliers and *ejidatarios*. The program is now being restructured but it is still not clear what the results will be. Also, according to survey results, only 10 percent of *ejido* producers accessed the program even though it was specifically targeted towards *ejido* producers. Among *ejidatarios*, those with more land located in relatively more developed communities, were more favored in participating in the program. As a result of its matching grant approach, projects financed by *Alianza* were small in size and required little investment on behalf of the producers. Of course, a number of changes in program design have been implemented since 1997 and it would be of great interest to have a more thorough analysis of the program's welfare impact under these revised parameters.

2.6.3 ASERCA (*Apoyos y Servicios a la Comercialización Agropecuaria*)

Characteristics: In view of the severe shortcomings of Mexico's marketing and storage infrastructure, ASERCA, which was established in 1991, aimed at developing and modernizing agricultural marketing channels in key grain markets. Until recently, the program rested on the use of subsidies as a mean of overcoming the deficiencies faced by producers in marketing their outputs. Over 90 percent of its commercialization subsidies had been allocated to wheat, maize, and sorghum. Its most important interventions consisted of marketing subsidies and the promotion of production contracts. These were expected to achieve four main objectives, namely (i) to promote the development of regional grain markets while ensuring the absorption of marketable surpluses; (ii) reduce the price uncertainty that characterizes these crops; (iii) help eliminate imbalances in production between the country's regions; and (iv) develop appropriate channels of information about prices, areas planted, and other key information that may help farmers in taking optimal productive decisions. To accomplish these objectives, ASERCA's marketing subsidies covered the difference between a 'reference' price established during the previous year and the actual market price. Subsidies are directed mainly towards regions with a large share of the above mentioned crops, and awarded to marketing firms under two different mechanisms. In either case, private intermediaries could obtain a subsidy to cover the transport costs from producing to consuming areas, the cost of storage, and a pre-determined profit margin. Recent revisions aim to replace the subsidy to traders with a grant to producers to defray marketing costs independently of the type of product being marketed.

Impact: According to its original conception, the program undermined incentives to shift away from grains, a major objective of reform. It is interesting to notice that this program undermines the general objective of the trade reform, namely create appropriate incentives for producers to shift from grains to vegetables and fruits. In fact, ASERCA covered substantial portions of the national production of these crops. For example, it covered 32 percent of the summer/spring production, and 47 percent of the fall/winter production of maize (1999). In the case of the fall/winter sorghum in Taumalipas (the most

important State for sorghum), since 1996 *ASERCA*'s coverage varied between 86 percent and 90 percent; for wheat, and its intervention covered almost 100 percent of the production during the 1998/99 fall/winter cycle. The consequences of these massive interventions were particularly troublesome in view of the fact that the prices determined by *ASERCA* have generally exceeded those that would have prevailed in a completely liberalized environment. Moreover, *ASERCA*'s intervention has impeded an adjustment in the production pattern among regions based on local comparative advantage in the production. A major problem of the program is that fixing producer prices that do not adjust according to the development of the crop cycle has eliminated the incentive to develop local storage facilities that producers could use in order to sell their products with the most profitable timing. Finally, there is ample evidence that a major problem in converting from grains to vegetables and fruits lies in the marketing stage. Rather than concentrating on supporting resources on grains, these should have been concentrated on promoting and developing the marketing of perishables in order to attract resources towards their production. It is hoped that the new system currently developed will avoid several of these distortions.

2.6.4 *SEDESOL (Secretaria Desarrollo Social)*

The purpose of *SEDESOL* is to support programs whose main content is poverty eradication. There are two programs that are important from our perspective. The first, *PRONASOL*, aims to promote social infrastructure at the municipal level. This program was initiated in the early 1990s and is characterized by high variability in terms of effectiveness, sustainability, and targeting, something that has led to a number of reformulations of the program. The second program of relevance within the agricultural sector is the *CREDITO A LA PALABRA* program which has the objective of supporting small producers on resource poor rainfed lands with low-interest and collateral-free credit. Producers are typically cultivating grains for home consumption, must demonstrate a legitimate entitlement to the land they cultivate, and have been stable residents within their communities. The program was started in 1989 and was expanded in 1990 into the program of Solidarity Funds for Production (*Fondos de Solidaridad para la produccion*). These Funds then provided the seed capital for *Cajas Solidarias*, non-bank financial intermediaries, created in 1992. These *cajas* emphasized savings mobilization. The savings/equity ratio of these *cajas* rose from 0.09 in 1995 to 0.33 in 1999.⁴¹ It encompasses producers in both the private and social sector and covers up to three hectares of land per producer. At the peak of its coverage, the *Credito a la Palabra* was used by 760,000 producers cultivating 1.4 million hectares. The states where most of the beneficiaries were located were Oaxaca, Chiapas, Michoacan, Veracruz, and Guanajuato. The program has an insurance component that facilitates writing off of the loan in case of harvest failure. During 2000, the amount loaned was MXP 550 per hectare. While the *cajas solidarias* have achieved an extensive outreach in marginal areas, their main challenge remains their financial sustainability as arrears have risen from around 4 percent of the portfolio in 1994 to around 22 percent in 1999. Finally, *SEDESOL* participates in *PISO*, a program that aims to promote social infrastructure at the municipal level and support an orderly and rational urban expansion in peri-urban areas and that will be discussed in more detail below.

2.6.5 *Programs in the Forestry Sector*

In anticipation of the new opportunities that would be presented by the reform of Article 27 of the Constitution and the lifting of restrictions on the lease of *ejido* lands, the government developed a program to promote establishment of commercial forest plantations on under-utilized lands, *PRODEPLAN*, in 1997 (total budget in 2000 was Pesos 250 million). The program is targeted to areas with sufficient extensions of land and short distances to a port or major marketing center. Another program, *PRONARE*, with a 2000 budget of Pesos 258 million, is a government financed reforestation program directed at degraded peri-urban areas and green spaces in urban areas under the *Solidaridad social* fund program. During the past administration, *PRONARE* was transferred to *SEMARNAP*'s Sub-

⁴¹ Source: Rural Finance: Savings mobilization potential and deposit instruments in marginal areas, World Bank, report no. 21286-ME, October 30, 2000, 2 volumes; Annex 3 in Vol. 2: Savings mobilization by non-bank financial intermediaries in rural Mexico by Julia Paxton, table 5.

secretariat of Natural Resources and it had variable results due to the poor selection of species to match site conditions and uneven commitment from producers and municipalities to protect the reforested areas after establishment. Positive support from the government to communal owners is even more recent.

A capacity-building and technical assistance pilot for forest communities in Oaxaca, PROCYMAF, was implemented in late 1997. This program has brought 165,000 hectares under improved management (including 76,000 hectares of new areas), created 13,000 hectares of conservation area, prepared land use plans in 117,000 hectares of non-commercial forests, and created 1,300 permanent forest-based jobs in community enterprises, thereby already paying back the fiscal budget for the World Bank's loan money disbursed for the project so far. PRODEFOR, a national forest management and development program modeled on the philosophy of PROCYMAF, was established in 1997 as a national trust fund which allocated technical assistance funds in up to 22 states with important forest resources through a matching fund scheme with participating states. Initially, 100 percent of PRODEFOR funds were to finance technical assistance study proposals from individual and community forest producers, with limited funds for promotion or monitoring, and no complementary financing of capacity-building activities targeted to forest producers. However, while there has been positive response to the program, the bulk of beneficiaries preparing proposals were the more advanced *ejidos* and private producers, rather than the broader range for which the program was designed. In addition, the number of service providers able to provide quality technical assistance to beneficiaries has been limited. The program has been adjusted to increase the counterpart contribution from the federal government, and to include a greater margin of resources for administration and promotional expenses. But, greater recognition is needed that without building the capacity and skills of both service providers and forest owners, quality proposals will not be presented or implemented, and targets will not be reached.

The major obstacle for investors in commercial plantations on available tracts of land is a widely perceived lack of clear rules for initiating ventures between land owners and potential investors and lack of capacity. Smallholders do not have either the investment capital to make shifts from one type of production to another. Nor is there an active land market that enables communities and *ejidos* to buy land individually to reduce pressures on common pool resources, despite strong interest from indigenous communities to consolidate their territory.

2.7 The social sector

History: The social sector emerged in the wake of the Mexican Revolution (1911) after which land was taken from large landowners and distributed to the peasantry. Under Article 27 of Mexico's 1917 Constitution, the *ejido* system was given control over substantial land and water resources. Individuals within these groups, *ejidatarios*, were given usufruct rights over a parcel of land, access to communal land, and the right to a house plot. The group, not individuals, had access to credit in kind, for which the group had to grow officially approved crops. *Ejidatarios* had to work the land directly and were prohibited from hiring labor. Being absent from the land for more than two years led to losing their usufruct rights. Also, since they had only usufruct rights to land, it was impossible to either rent or sell the land, thereby greatly limiting their ability to access credit outside a special system that was set up specifically to cater to the needs of the *ejido* sector. Access to irrigation water required permits that carried conditions about land use. They could vote in the *ejido* assembly; however, the validity of that assembly and its decisions required the presence of a representative of the SRA.⁴²

Characteristics: Mexico's social sector consists of 29,162 communities of which 26,796 are *ejidos* and 2,366 *comunidades* with an estimated 3.2 million *ejidatarios*. The total area occupied amounts to roughly 103 million of hectares, or 56 percent of the national land usable for agriculture even though the quality is

⁴² Indigenous communities were grouped into *comunidades* with the same rights and restrictions as *ejidos*. Therefore much of the subsequent discussion pertaining to *ejidos* also applies to these *comunidades*.

likely to be lower than in the private sector. In addition, 70 percent of nation's forests are under *ejidos*.⁴³ While most of the social sector's communities are rural, there are 1,122 communities in urban areas, presenting a major source of land for future expansion of the cities in Mexico. Of the agrarian subjects, 63.4 percent are formally recognized as *ejidatarios*, 10.6 percent are *posesionarios*, while 26.6 percent are recognized as *avecindados*. *Avecindados* are members of the community that have lived in the *ejido* urban area for more than a year and are recognized as such by the assembly. They are usually descendants of *ejidatarios*. *Posesionarios* only possess their plots within the *ejido* but no other rights. It is interesting to note the higher percentage of *posesionarios* in the *ejidos* located in the southern regions (South Pacific and Gulf). This can be explained by the greater demographic pressure in that area of the country.

Table 2: Share of households with income below one minimum salary in *ejidos* and the general population, Mexico, 1990

	<i>National</i>	<i>N. Pacific</i>	<i>S. Pacific</i>	<i>Gulf</i>	<i>North</i>	<i>Center</i>
Income Ejidatarios (% < 1 min wage)	53	25	79	65	60	52
Income (% < 1 min wage)	26	15	49	33	25	24

Source: 1990 Population Census

Poverty: After over seven decades of communal ownership and production, inflexibility in resource use, low productivity and poverty in the *ejido* sector were widely believed to be pervasive. Even though there is no recent evidence, census data on income levels highlight the pervasive nature of poverty in Mexico's *ejidos* (Table 2). 53 percent of *ejido* households, as compared to 26 percent of the total population, received less than one minimum wage. Regional differences are pronounced, with the share of households below one minimum wage lowest in the North Pacific (15 percent and 25 percent for *ejidos*) and highest in the Gulf (49 percent in the general population and 79 percent in *ejidos*). Studies find that being located in an *ejido* increased the probability of being poor by more than 50 percent (Velez 1995). In 1994, 47 percent of the *ejido* households were estimated to be below the poverty line and 34 percent were in extreme poverty (De Janvry, Gordillo, and Sadoulet, 1997). The *Ejido Study* (1999) found that poverty was positively associated, among others, with a higher share of income derived from agriculture, cultivation of traditional grains versus fruits and vegetables, credit rationing, and residence in non-cohesive or malfunctioning *ejidos*. The data from the 1991 Census are quite striking. In each region, the percentage of *ejidatarios* earning less than one minimum wage is much greater than that of the average population⁴⁴. Not surprisingly, the numerous controls on use of *ejido* resources fostered corruption and red tape and led to an increasing politicization of *ejido* life. Political control and patronage were pervasive, something that is very important for governance.

A typology of *ejidos*. In general, one can distinguish three "types" of *ejidos*, namely those relying predominantly on agriculture, those that are endowed with significant natural resources, and those located in peri-urban areas. Although these categories may overlap to varying degrees, in reality use of such a typology allows to highlight the specific problems confronted by individual *ejidos* and the policy issues that need to be addressed as a consequence.

2.7.1 "Agricultural" *ejidos*

In predominantly agricultural *ejidos*, the main source of income is crop production rather than livestock ranching. These *ejidos* are located in more fertile areas of the country, endowed with higher shares of irrigation and soils suitable for agricultural production. Although little systematic information post-1991 is available, comparing the characteristics of *ejidos* to those of the private sector allows to identify some characteristics that are of policy relevance (Table 3). The first is that the labor-land ratio is, with 7.02, more than double of what is observed in the private sector (2.87), despite the fact that, if anything, land quality in the private sector is higher than it is in *ejidos*. In view of the fact that land quality in the *ejido*

⁴³ Source: Mexico *Ejido Reform: Avenues of Adjustment—Five Years Later*, report no. , Main report, World Bank, September 7, 1998; para 9.

⁴⁴ It will be interesting to compare these data with those from the new 2001 Census to see whether the poverty gap between *ejidatarios* and private farmers has in fact declined.

sector is generally believed to be slightly worse than for private farmers, this can partly be explained as the consequence of a policy which, for decades, tried to “bind” households to the land rather than allowing free movement of labor.⁴⁵ It also suggests that, once the restrictions on labor movement are released, there is likely to be a strong pressure of out-migration and better operation of other factor markets (e.g. land rental and sales markets). The endowment of livestock per producer is much lower in the social as compared to the private sector and the high potential of many *ejidos* for forestry is illustrated by the high levels of wood production, which is almost triple of what has been produced in the private sector. On the other hand, there are some attributes, such as the overall number of tractors, or the share of subsistence producers, where the differences between the two sectors are relatively minor.

Table 3: Comparing the private and the *ejido* sectors

	Private	<i>Ejidal</i>
Total area (has)	108,346,084.55	103,290,099.15
No of producers	1,006,193.00	2,655,129.00
Total labor force	3,112,071.00	7,252,811.00
Labor per 100 ha	2.87	7.02
No of tractors	149,513.00	146,849.00
Area per producer	107.68	38.90
Share of subsistence producers	49.2%	44.5%
Cattle herd per producer	34.59	11.48
Wood production (m3)	3,431,824.28	9,721,321.99

Source: 1990/91 Agricultural Census

By illustrating the danger of the *ejido* sector developing into a repository of surplus labor, these figures provide a strong justification for the 1992 legal and institutional reforms, an important goal of which was to improve the free movement of labor. We will examine the extent to which such improved factor mobility has indeed been achieved below. At the same time, the figures point to the scope for higher levels of investment (and possibly collective action) in the *ejido* sector to improve the utilization of the existing endowment. Finally, in view of the similarities between the different groups of producers, it is likely that, once the main structural impediments had been removed, there would be increasingly less justification for a policy specifically targeted to the social sector.

Unfortunately, there are no data sources that cover both the private and the social sector, or even the whole *ejido* sector, for more recent time periods. In the absence of such information, data collected by the PA for certified *ejidos* can provide a more detailed appreciation of the factor endowments of *ejidos* in different parts of the country (see Table 4).

The table illustrates that even within the *ejido* sector there is considerable regional variation. For example, the precarious land endowment and greater pressure on available land resources in the Gulf is clearly evident from the high share of *posesionarios* (12 percent) and the fact that 81 percent (as compared to less than 20 percent in the North and Center) of the commons are used for rainfed agriculture.

⁴⁵ A second possibility is that there are significant non-economic barriers to incorporation into the labor market, e.g. language in the case of the indigenous population.

Table 4: Productive characteristics of certified ejidos, 2000						
	<i>National</i>	<i>N. Pacific</i>	<i>S. Pacific</i>	<i>Gulf</i>	<i>North</i>	<i>Center</i>
Progress with certification						
Total number of <i>nucleos agrarios</i> ⁴⁶	29,162	3,004	3,610	5,152	6,842	9,554
% communities certified (Jan, 2000)	70	80	44	82	82	69
Population						
Avg. no of households per ejido	123	129	137	116	105	142
Ejidatarios (%)	63	66	61	65	69	57
Posesionarios (%)	11	4	11	12	5	9
Avecindados (%)	26	30	28	26	26	25
Land endowments						
Average total area in the ejido	2,234	10,787	1,160	2,396	3,611	955
Share of parcels	30.0%	15.3%	69.5%	20.1%	20.8%	48.1%
Common lands	68.0%	83.8%	27.1%	78.3%	77.2%	49.0%
House plots	0.4%	0.1%	1.4%	0.5%	0.4%	1.2%
Land quality (parceled land)						
Area per ejidatario of parceled land	5.45	12.79	5.88	4.15	7.15	3.23
Irrigated or humid (%)	24	33	11	3	24	19
Rainfed (%)	59	43	76	68	62	58
Pastures (%)	6	5	5	11	3	3
Low quality pasture (%)	9	16	7	7	9	3
Land quality (common land)						
Area per ejidatario of common land	12.35	70.07	2.29	16.17	26.55	3.30
Irrigated or humid (%)	4	5	1	2	1	1
Rainfed (%)	17	13	30	81	13	19
Pastures (%)	24	25	10	7	26	14
Low quality pasture (%)	53	54	55	6	57	46

Source: 2000 Procede, PA-RAN. INDA, Censo ejidal.

2.7.2 *Natural resource rich ejidos*

Ejidos characterized by a prevalence of natural resources differ from those based on agriculture in the greater relevance of grazing, forestry, or other forms of resource exploitation which generally require considerable levels of collective action. These *ejidos* are located in more marginal areas, prevalently in the arid and semi-arid areas of the country and are characterized by low agricultural potential. A subcategory of these *ejidos* consists of indigenous communities organized as either *ejidos* or *comunidades*.

Many *ejidos* and *comunidades* lack the internal or business organization or management tools to take advantage of the value of their forestry and other natural resource base. In pilot areas where this potential has been developed, selected *ejidos* and communities have generated very significant economic returns and local employment. The amount of cash that can be generated from sustainable use of the natural resources available to such *ejidos* is generally more limited. This is exacerbated by the fact that Mexico is unable to compete with North American plantation products or industrial markets that rely on undifferentiated products and services, implying that it will have to focus on the marketing of value-added timber products from native forests, and other non-timber forest products and services into specialty and niche markets. This implies a need for capacity building in managerial issues, as well as the management of commonly owned resources. Also, increasing investment remains an important challenge for which, in view of the limited value of land resources, non-credit based mechanisms (such as joint ventures) may be

⁴⁶ Nucleos agrarios include either ejidos or communities.

more appropriate. Indeed, a number of institutions exist to cater to these needs and we will discuss them in more detail below.

A second issue is that many of the environmental services provided do not have a market. While the importance of such services is slowly recognized by the international community as well as Mexican policy-makers, plans to provide appropriate monetary compensation for their provision are still in their initial stages.

Table 5 - Use of common property resources by *ejidatarios* 1994 and 1997.

	All <i>ejidatarios</i>	<i>Ejidatarios</i> w/o Procede	<i>Ejidatarios</i> with Procede
Use of CPR for pasture in 1994	14%	14%	18%
Use of CPR for pasture in 1997	28%	24%	37%
Use of CPR for gathering in 1994	25%	26%	7%
Use of CPR for gathering in 1997	35%	29%	46%
Use CPR for logging in 1994	21%	22%	4%
Use CPR for logging in 1997	9%	10%	7%

Source: 1994 and 1997 *ejido* surveys

Nation-wide, almost 70 percent of the national forestland is found within *ejidos* and communities, while about 50 percent of the nation's coasts belong to these communities (Rincon 2000). In spite of the abundance of natural resources, only 13.8 percent of the communities exploit forests resources while 25.2 percent have access to these resources for general exploitation by its members. This is reflected in the organization of the *ejidatarios* and *comuneros* for the exploitation of these resources: 50.2 percent on an individual basis, 18.2 percent collectively, 11.1 percent both ways, while in only 2.9 percent of private firms participate in the exploitation. Unfortunately, much less attention has been devoted to this group of *ejidos* than to the productive and peri-urban ones. Most of the available information may not be representative as it is based only on certified *ejidos* (e.g. Robles et al. 2000).

Case studies show that most of these *ejidos* have the potential to generate at least a limited amount of resources from the commodities to which they have access, but that collective action problems and conflict often preclude utilization of even the limited opportunities available. Table 5 illustrates not only the high degree of use made of common property resources for pasture as well as for gathering in 1994 and 1997 –and the marked increase in such use between the two years, probably in response to the financial crisis- but also the differences in such use between certified and non-certified *ejidos*, a topic to which we will return below.

Many of the natural resource rich *ejidos* or communities count with a majority of indigenous population. Article 27 of the Constitution and the LA explicitly take into account the specific problems posed by indigenous communities. Section VII of Art. 27 and art. 98 I of the LA clearly state the commitment to preserve the territorial integrity of these groups and their right, if deprived of their lands, to have them returned and to be formed as a *comunidad*. Finally, the LA requires the system of agrarian justice to take into account the indigenous' traditions and cultural peculiarities in their decisions, provided that rights of third parties are not violated and that the Law itself is not violated (Art. 164).

It is traditionally argued that the indigenous population is characterized by a tendency to live in close communities in which access to land and natural resources is equally shared among members. According to this vision, indigenous farmers rarely are to be found cultivating private property. The availability of the PROCEDE data revealed quite a different picture. According to Berlanga's (2000) analysis, the main characteristics of the indigenous communities in relation to the access to land are:

- Municipalities where indigenous communities are more present are also characterized by a high degree of poverty (according to the marginality index).

- The main form of ownership among indigenous communities is the *ejido* and not the *comunidad*; Moreover, in about 50 percent of the existing *comunidades*, the share of indigenous population is low or null. Thus, it is incorrect to identify the *comunidades* with indigenous communities although the internal organization of indigenous ejidos is very different from non-indigenous ejidos⁴⁷.
- A relevant share of indigenous households have private ownership over their land and this is comparable with non indigenous farmers across areas with differing presence of indigenous population.
- As of 1999, 1,122 indigenous communities opted for completely assigning parcel (individual) rights to the land versus 871 that opted for becoming *comunidades*. Moreover, 1,245 communities assigned both individual rights to the land as well as rights of access to common lands. Thus, the importance of common lands within the indigenous communities is more the reflex of land quality and historical factors than for reasons connected to the indigenous culture of the population.
- The distribution of parceled land within the indigenous *ejidos* is similar to that found in non indigenous *ejidos*. Comparing indigenous private landowners and indigenous *ejidatarios*, these do not differ very much in terms of share of small farmers (less than 5 hectares), share of women landowners, and the distribution of land between crops and livestock. Thus, even though there are marked differences in the institutional structure, the information available suggests that there are also a large number of commonalities between indigenous and non-indigenous communities (or *vice versa*).

2.7.3 Peri-urban ejidos

Peri-urban ejidos. The inclusion of *ejidos* located in the urban fringes and peri-urban areas of rapidly growing urban centers represents one of the greatest challenges for the agrarian sector during the next decades. It is forecasted that the major 100 urban centers will require about 700,000 new housing units per year. Over two thirds of the lands required for the expansion of these centers will come from the social sector. Past experience, rooted in the rapid rural-urban migration that marked the demographic transition of modern Mexico, has been confronted with three main problems.

Land invasions as the primary means of getting land access: Almost 5 percent (or about 5 percent) of Mexico's *ejidos* are located in the country's 110 main cities and 15 percent of all *ejidos* were, in 1996, affected by problems of land invasions and informal settlements. The illegal invasions of the *ejido* and communal lands by poor migrants leaving the rural areas has resulted in a slower development of a real estate financing sector that could serve as a basis for improving housing quality for the poorest segments of the newcomers to the urban sector. This has given rise to widespread conflicts between new (informal) occupants and *ejidatarios* which, in addition to constituting a time bomb that is waiting to explode, also undermine the broader framework of governance in rural areas.

Limited scale and low productivity of investment: It is well known that unplanned settlement greatly increases the costs of service and infrastructure provision for local governments. As a result, little investment was undertaken and, jointly with the low density of housing to land typical of these settlements, real estate values in these areas have been inefficiently low.

Limited local government capacity: Municipalities often lack the technical expertise to plan the expansion and optimum use of peri-urban areas that needed to be incorporated in the urban fringe. As a

⁴⁷ The adoption of the *ejido* as a legal form of organizing indigenous agrarian communities has precise historical and cultural reasons. First, to recover their lands after the revolution, dispossessed communities had to provide documentation of pre-existing rights. When these were lacking, something that was often the case, the Agrarian Authority would proceed to the distribution of land by forming *ejidos*. Second, until 1940 the normative framework regulating the *comunidades* was quite weak compared to that of the *ejidos*. Thirdly, the norms regulating the *ejidos* and *comunidades* seem not to impede indigenous communities from governing according to their traditions, making the adoption of one for of government versus the other irrelevant. This specific process of obtaining recognition of land right implies that there is no unequivocal correspondence between tenure regime (i.e. *ejido* vs *comunidades*) and organization for land use. Indigenous communities in fact have their internal organization based on their traditions and cultural specificities that inform their practices of allocating rights to land use and access.

consequence, and partly due to political maneuvering, decision-making processes have often been not transparent and fraught with corruption, thereby depriving *ejidatarios* of all or part of the rents that they could have realized from the sale of their properties in the open market. The rigid legal environment left expropriation of land irregularly settled as the only administrative solution to the ex-post incorporation of social land into the urban sector. For *ejidatarios* and *comuneros*, land expropriation and the limitation of the legal environment have removed the opportunity of investing on the communities' lands and therefore to reap the potential gains from urbanization. Although *ejidatarios* and *comuneros* have in many instances illegally sold their lands to new settlers only to be compensated afterwards by the federal government through expropriation, this is hardly a first best solution.

3. *The 1992 reforms: main accomplishments and institutional challenges ahead*

In this section we first describe the main legal and institutional reforms and the main characteristics of PROCEDA, the sector institutions involved in its implementation, and the process and safeguards involved. Both quantitative evidence on outputs, as well as qualitative assessments by *ejidatarios* suggest that the program has not only made great advances in terms of area covered, but also that it has increased tenure security and reduced conflicts in rural areas. The main institutions involved in implementing these provisions were the following:

- The *Secretaria de Reforma Agraria* as the lead institution, charged with land tenure regularization, policy coordination, and agrarian development.
- The *Procuraduria Agraria* which has the responsibility of providing legal assistance and act as an ombudsman to small farmers within and outside the social sector.
- The agrarian courts which, in addition to greatly reducing the overhang of unresolved cases from the pre-1992 period (the “*rezago agrario*”), also deal with newly arising conflicts.
- The *Registro Agrario Nacional* (RAN) which archives the information generated and provides proof of land ownership upon request and validates and registers modifications in property rights.
- The Corrett and PISO which have developed a range of mechanisms beyond the traditional tool of expropriation to make peri-urban *ejido* lands available for urban development.
- The FIFONAFE which manages funds (*Fondos Comunes*) for the *ejidos* and has recently started to embark on a number of ventures (e.g. micro-credit and, in peri-urban areas, establishment of *sociedades inmobiliarias*) in line with its mandate to help develop the productive potential of *ejidos*.

3.1 *Legal and institutional changes*

The system of state sponsored redistribution of land that was put in place after the 1917 revolution had a number of disadvantages, up to the point that it has been described as being directly responsible for the backwardness of the social sector. Three main limitations were the following:

- The limitations on functioning of land markets led to a situation whereby many old people were unable to make efficient use of their land, while young households next to the *ejido* suffered from significant land shortages. While no data are available for the pre-1992 period, data from 1997 indicate that the mean age in *ejidos* was 52 years, with 53 percent of the population being older than 50 and about 25 percent older than 65, many of them women. This contrasts sharply with the age distribution in rural areas overall, where about 50 percent of the rural population are younger than 20, many of which do not have access to land.
- Restrictions on land transfers in *ejidos* also created a formidable obstacle to an effective and efficient process of urban expansion, an issue that is significant in view of the fact that, out of a total of 150 million hectares used for urban development between 1995 and 2000, more than two thirds (105 million hectares) were from the social sector. The fact that local governments could get access to this land only via expropriation (with land values set at the agricultural rate) provided perverse incentives

to *ejidatarios*, contributing to uncontrolled expansion of informal settlements with all the associated problems.

- As a consequence of the legal and administrative restrictions, *ejidos* were characterized by disproportionately low levels of investment, often unsustainable resource use, and high levels of poverty. A survey of *ejidatarios* and private producers in 2000 found that the average capital endowment in *ejidos* is significantly lower than what is owned by neighboring private producers (PA 2000). In an income equation for 1991, being located in an *ejido* increased the probability of being in extreme poverty by 50 percent (Velez 1995). All of this implied an urgent need to “complete” Mexico’s land reform, a step that was to be accomplished with the constitutional reforms of 1992.

In the broader context of liberalization in 1992, a set of constitutional reforms was undertaken to overcome these shortcomings and provide the legal and institutional basis for the emergence of a more dynamic social sector. Three main elements in the legal setup were to (i) strengthen self-governance of the *ejido* in a way that allowed it to choose, among others, its property rights regime; (ii) the elimination of land rental restrictions;⁴⁸ and (iii) a reduction of the discretionary powers of the executive.

- A main element was an increase in the status of the *ejido*. In addition to defining *ejido* organs and setting an overall procedural framework, the law explicitly recognized the legal personality of *ejidos* and the ability of the assembly to autonomously regulate matters internally to the *ejido*. As such, the assembly of all *ejido* members can, among others, decide to enter into contracts, including the formation of joint ventures (*sociedades mercantiles y civiles*), decide on whether lands owned by its members are to be held under communal or individual ownership, and whether *ejido* members have the possibility of making the transition towards fully individual property rights (*dominio pleno*).
- A second fundamental set of changes was the replacement of the wholesale on the ability to exchange land with a more nuanced set of regulations. Land rental was freed completely while sales were allowed within the *ejido* but not (unless the assembly had decided on adoption of *dominio pleno*) with outsiders. A systematic program of land rights regularization (PROCEDE), to be described below, served to document existing land rights and to issue legally valid certificates to individual land holders, both to furnish proof and to allow the subsequent exercise of these rights.
- Finally, the President’s power (or obligation) to grant lands was eliminated and the administration of agrarian justice was separated from the executive and vested with an independent system of agrarian justice. This coincided with the declaration of the end of land redistribution (the “*reparto agrario*”) and the establishment of a clear set of rules, including compensation, for expropriation. Reducing the power of the executive and introducing an independent judicial check on the way in which it exercised its power was instrumental in creating the pre-conditions for more secure property rights by individuals. Thus, even though an overall land ceiling remained in place, the period of land redistribution as the main way of gaining land access was brought to an end and replaced with reliance on the functioning of markets.

Institutional changes: Even though we will discuss the institutional arrangements in more detail below, it is useful to have a brief overview of the main institutions. The principle underlying the reform of article 27 was separation of the executive power from the administration of the internal life of the *ejidos*, and establishment of an independent and manageable system of agrarian justice, thus increasing households’ ability to enforce and exercise their property rights. Key measures involved the establishment of a decentralized and accessible system of agrarian justice, an independent registry for the social sector, and the creation, in the *Procuraduría Agraria*, of a de-concentrated structure to provide legal support to *ejidatarios* and systematically implement the program of property rights regularization.

⁴⁸ This includes the elimination of restrictions such as the prohibition of sharecropping contracts, land sales (though some which are still subject to less stringent restrictions), and joint ventures with firms and individuals not belonging to the *ejido* were removed as well.

- To allow effective and accessible agrarian justice, a system of 42 *Tribunales Unitarios Agrarios* as well as an appeals court, the *Tribunal Superior Agrario*, were created. Between 1992 and 1999, about 350,000 conflicts were brought before, and dealt with, these Agrarian Courts, thereby eliminating a huge backlog of cases that had accumulated from the past. In dealing with conflicts, the *tribunales* are explicitly instructed to seek a settlement out of court. Special mechanisms were put in place to ensure accessibility by the poor. To avoid conflicts in the future, special programs to assist *ejidatarios* in establishing and notarizing their will (*lista de sucesores*) were initiated by the RAN.
- To allow independent verification of property rights, a special registry (*Registro Agrario Nacional*; RAN), with delegations in each of the states, was created. The RAN issues, among others, certificates that document a household's entitlement to his individual parcels, *certificados de derecho al uso comun*, that document a household's right to the proportional use of common lands (in case the assembly has decided in favor of common use), and titles for urban plots as well as titles for *dominio pleno* for those individuals who, following the general authorization by the *ejido*, decide to enter into this form of arrangement, which are subsequently inscribed in the public registry. Technical backstopping has up to now been provided by the National Statistics and Geography Institute (INEGI).
- Since small farmers who had been under the tutelage of local authorities for a prolonged period of time would still find it difficult to ascertain their rights –especially insofar as past irregularities were concerned- the *Procuraduria Agraria* was created to provide legal assistance to *ejidatarios* and perform an ombudsman function. This institution fulfills three main functions. First, it supervises that due process is followed in applying the procedures outlined in the new law. Second, it fulfills an ombudsman functions in which it is charged to actively represent and defend *ejidatarios*, *comuneros*, other agrarian subjects, and private farmers. To fulfill this function effectively, it constitutes a civil service structure that provides paralegal assistance (*visitadores*) and lawyers to the social sector.

3.2 Legal basis and implementation structure of PROCEDE

Land regularization program: All of the legal elements and institutional arrangements were supposed to feed into a program of land regularization (*PROCEDE*; *Programa Nacional de Certificacion de Derechos Ejidales y Solares Urbanos*), the purpose of which was to resolve boundary conflicts, regularize land tenure, and issue property rights certificates. This program, which complements the constitutional reforms of 1992 and which was started in 1993, consisted of several components: Following a general dissemination campaign and presentation of the program to the general assembly, the highest decision-making organ in the *ejido*, members are free to join this process which, during a period of 12 to 18 months, allows *ejidatarios* to choose their property rights regime, delineates *ejido* boundaries, measures individual plots, and eventually issues certificates to individually owned plots (including house plots), as well as communally managed lands to each individual.

Institutional responsibilities. Under the general principle that each *ejido* decides in complete autonomy whether to join PROCEDE, there is a need for inter-institutional coordination in order to facilitate such a decision and to implement the program in case this decision is positive. The main institutions involved and their responsibilities are as follows:

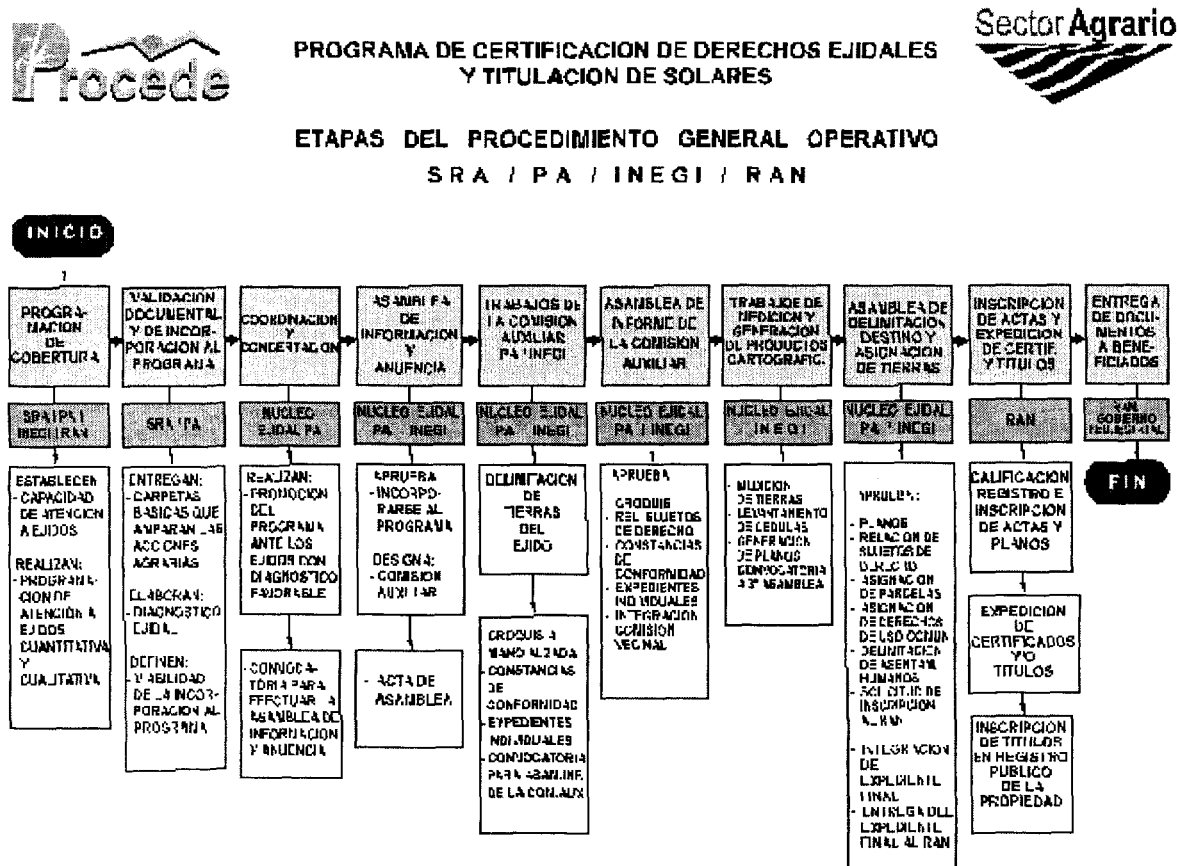
- The *SRA* is responsible for the program coordination, the collection of the basic documentation and information used to guide overall implementation, coordination with other institutions, and monitoring. Due to the severe budgetary limitations, the *SRA* has often not been able to comply with this mandate and much of the coordination and monitoring function was taken over by the *PA*.
- The *PA* supervises the internal coordination of the *ejidos'* certification process, mediates in conflicts over land rights between *ejidatarios* and other members of the community (*avecindados*,

posesionarios, private farmers, etc.), ensures that the procedures followed abide by the Law, and protects the rights of the parties involved.

- *INEGI (Instituto Nacional de Geografía e Informática)* is the institution responsible for the technical-operative tasks which allow *ejidatarios* to identify the areas to be certified, define their geographical coordinates, measure their borders and limits, and produce the resulting cartographic material. It was envisaged that this would result in the transfer of capacity that would eventually enable the RAN to carry out these functions independently.
- The *RAN (Registro Agrario Nacional)* is expected to formalize the land rights acquired by agrarian subjects. It thus enforces the assembly's decisions and the agreements reached by the parties involved by inscribing and certifying the legal validity of the elaborated cartographic material, expediting and certifying the titles to the land, and by ensuring the juridical and documentary certainty.
- State and local governments and, in exceptional cases also other institutions, participate in the coordination and promotion of PROCEDURE and the provision of operative and legal support. The presence at the assemblies of notaries (*Fedatarios Públicos*) is required by Law. In addition, minor roles are played on a case by case basis by institutions such as *SAGARPA*, *SEDESOL*, and *SEMARNAP*.

Procedural safeguards: The main organ of the *ejido* involved in PROCEDURE is the Assembly that is required to follow the procedures (i.e. prior notification and having a quorum) prescribed by the Law for extraordinary decisions. The *ejido* assembly has the authority of subdividing the community's lands between common lands, individual parcels, and settlement area. The *RAN* is assigned the role of defining the technical guidelines to be followed by the assembly for the measurement and delimitation of the land within the *ejido*. Given the importance of land access and land ownership, a number of procedural safeguards such as minimum lead times and quorums for meetings and supervision of assemblies by independent lawyers and the *Procuraduría Agraria* have been put in place to minimize the risks of political maneuvering. In addition, there are safeguards (Art. 61) which allow, within 90 days of the assembly, an appeal against any decisions taken by an extraordinary assembly by a minimum of 20 percent of the *ejidatarios*, if they believe their rights have been violated. The *PA* acts as an independent ombudsman and can appeal against the assembly's decisions in case there is reason to believe that the assignment of the *ejido* land has been conducted with serious legal flaws, or when public order may be at stake.

Figure 1 – PROCEDE Implementation Process



The *RAN*, which is required to help the *ejido* in the process, inscribes the certificates that have been generated in the *Registro Publico* and provides the general plan of the *ejido* which reports in print the internal subdivision of the *ejido*'s parcels. This plan is important for two reasons. First, it draws the internal boundaries precisely and is available to the whole community for consultation. This transparency is likely to reduce the likelihood of new conflicts over the certified land and support an individual's claim over some land in front of the community. Second, should the *ejido* decide in the future to formally assign new rights over parts or all of the common lands, this will be done on the basis of the existing documentation. It therefore lays the legal foundation for orderly future changes in property rights.

The process of certification. The typical operative process that characterizes PROCEDE is organized in ten steps or phases which are described in Figure 1 and described in more detail below. The first three phases are completed before any institution is actually involved with the *ejido* directly, while the last two are conducted after the previous five phases have been concluded within the *ejidos*. This long process requires substantive preparatory work to identify which *ejidos* are to be approached; checks and balances throughout to ensure that the process is transparent, fair and accepted by all, the autonomy of *ejido* decision making, and technical input in the demarcation of boundaries. In order, the steps are the following:

1. The three institutions representing the Agrarian Sector and the *INEGI* for the State Committee conduct a qualitative and quantitative planning of the areas and *ejidos* that are to be targeted, examining the amount of resources that are available for the tasks.

2. To begin the examination of a given *ejido* in order to assess its suitability for PROCEDURE, the *RAN* supplies the *Carpeta Básica*, i.e. the legal documents pertaining to the history of the *ejido*. Documents included are the decrees of constitution of the *ejido*, subsequent modifications, records on additions and expulsions of *ejidatarios*, and other pertinent evidence. These documents are analyzed by the *PA* and on the basis of this examination the institutions determine whether the *ejido* can be approached or whether there is a need for prior resolution of conflicts, either within or outside the *ejido*.
3. The *PA's* *visitadores* (representatives) explain to representatives of the *ejido* the nature of the Program, how it intends to reach its objectives, and the procedures to be followed. If permission is granted by these representatives to proceed, an Information and Consent Assembly is convened.
4. The Information and Consent Assembly requires a quorum of at least 50 percent of the *ejidatarios*. *Ejidatarios* are informed about the programs' goals and procedures. Should the Assembly approve the program and decide to go ahead, the *RAN* is notified of the resolution, and an Auxiliary Committee of *ejidatarios* is formed that is responsible for the execution of next steps in implementation of the program.
5. The Auxiliary Committee, together with the teams from *PA* and *INEGI*, determines how the *ejido* lands are divided and trace out the demarcations between plots, between common, urban, and parceled lands, and the *ejido's* limits. A sketch map of the land within the *ejidos* is prepared. All of this work requires the consent of the *ejidatarios* that own the plots. Declarations of consent by the interested *ejidatarios* are formally annotated and are included in individual files that include all the relevant information so far collected. During this process, records on land occupancy by subjects without a formal title are also collected.
6. The results and materials obtained during the previous phase are presented to a second assembly. The assembly's assent is required to proceed to the next phase.
7. At this point the *INEGI* begins the phase of measuring plots, common lands, settlement areas, identifying in each case the purpose of the area in which different types of plots are located. Maps and printouts based on the information generated are generated. Finally, the individual files are completed with the data collected during this phase.
8. An Assembly of Delimitation, Assignment, and Entitlement to Land is summoned. This is the most important assembly of all, as *ejidatarios*, *avecindados*, and *poseionarios* are required to participate to approve all of what has been so far or concluded. Individual files, maps, and the *Ejido Plan* (which shows how the lands are distributed according to their function) are displayed for the 8-15 days preceding the assembly. The quorum required for the assembly to reach an agreement is 75 percent of the community members. A Public notary (*Fedatario Publico*) and a representative of the *PA* are required to assist for the assembly to have legal validity. If the Assembly approves, a request of inscription of the agreements reached on the entitlements to plots, common lands, and urban plots is sent to the *RAN*.
9. The *PA* delivers the request for inscription to the *RAN* with all of the supporting material. The *RAN* processes the request and produces the titles that certify the results of the Assembly. The titles to the urban plots are inscribed in the Public Register of Property.
10. The *RAN* delivers the titles or occupancy certificates to their owners. The delivery of these documents is made in public acts to which State and Federal authorities, and the State Committee are required to participate.

3.3 Accomplishments thus far

We discuss first the number of communities who have completed PROCEDURE and the status with respect to the different steps involved in the process before moving to a more substantive description of the impact of the program.

Figure 2: Advances in Procede implementation, Dec. 31, 2000



AVANCE GENERAL OPERATIVO AL 31 DE DICIEMBRE DEL 2000

NUCLEOS AGRARIOS CONSTITUIDOS	NUCLEOS CON DIAGNOSTICO		NUCLEOS CON ANUENCIA		NUCLEOS CON TRABAJO CON AUX. PA/INEGI		NUCLEOS CON ASAMBLEA INF. COMISION AUX.		NUCLEOS MEDIDOS	
	ABS	%	ABS	%	ABS	%	ABS	%	ABS	%
29,932	29,932	100	25,690	86	23,431	78	23,255	78	22,879	76

NUCLEOS CON PLANOS ENTREGADOS		NUCLEOS CON ASAMBLEA DE DEL. DEST. Y ASIDE T.		NUCLEOS CERTIFICADOS Y TITULADOS		TOTAL DE CERTIFICADOS Y TITULOS EXPEDIDOS	BENEFI- CIADOS	SUPERFICIE CERTIFICADA Y TITULADA (HECTAREAS)
ABS	%	ABS	%	ABS	%			
22,654	76	22,416	75	22,087	74	6'545,077	2'946,782	57'191,277

Note that coverage is lowest in the South Pacific where most of the country's poor are concentrated, especially in Chiapas (35 percent), Oaxaca (41 percent), and Guerrero (56 percent). This suggests that greater emphasis on these regions could make a significant impact on poverty reduction.

Quantitative achievements. As of December 2000, PROCEDE had achieved the following results:

- 100 percent of the communities had their diagnostic completed by the inter-institutional group (Steps 1 and 2) and 100 percent of the agrarian communities' representatives had been informed by the PA's visitors and informed about PROCEDE (Step 3);
- 86 percent of the communities summoned the Information and Consent Assembly officially joining PROCEDE (Step 4) and 78 percent of the communities completed the *croquis* and the registration of the members' consents to the demarcation of their lands' borders (Step 5);
- 78 percent of the communities approved the measurements (Step 6); 76 percent have been measured by *INEGI* (Step 7); 75 percent completed PROCEDE after its approval with the Assembly of Delimitation, Assignment, and Entitlement to Land (Step 8), and 74 percent formally received the whole documentation generated by PROCEDE (Step 10).

Also, adoption of the legal requirements and procedures has been massive. Over 18,000 *ejidos* have an internal set of rules recognized by the assembly. Approximately 35 percent have an updated list of *ejidatarios*. Some 50 percent have an accounting book reporting the community's expenses and revenues. Over 90 percent have legally elected representatives. In 1,500 *ejidos*, the majority of the *ejidatarios* have formed and submitted to the *RAN* the list of heirs. While the program did not accomplish the goal of covering all the *ejido* lands before 2000, it has managed to produce an impressive amount of material and legal documentation: almost 6.4 million cartographic products, 3.6 agrarian certificates and property titles to parcels, 1.3 million certificates of rights to use the common lands, and 1.6 million of titles to urban

plots. Overall, 2.9 million of agrarian subjects received their titles and certificates, and 57.2 million hectares of land (more than double the size of Spain) have been measured and mapped.

Qualitative assessment of impact: More importantly, the program is perceived by *ejidatarios* to have had a significant impact. Even though it was conducted in a relatively early stage of implementation, the 1997 *ejido* survey, which asked members of the *ejido* directly regarding the perceived impact of PROCEDURE, illustrates the impact of the program (repetition). There is relatively strong evidence for PROCEDURE to have reduced conflicts and increased social unity in the *ejido*, and some evidence suggesting that it increased activity in factor markets (Table 6). At the same time, the impact on credit access and productive investment remained more muted. As highlighted in the table, 28 percent of respondents felt that PROCEDURE reduced the number of conflicts (and 21 percent that it had increased social unity in the *ejido*), while 5 percent (and 12 percent) felt the opposite. Also, 19 percent, 23 percent, and 15 percent, respectively indicated that PROCEDURE had increased the number of land rental and sales transactions as well as migration, while 12 percent, 11 percent, and 8 percent felt that it reduced these factors. By comparison, the perceived impact on credit access and productive investment remains ambiguous; while 5 percent believed that PROCEDURE had increased investment, 4 percent believed it had decreased it. Questions included in the 2000 survey (not reported) point into a similar direction: *Ejidors* without PROCEDURE are characterized by a significantly higher presence of conflicts than those with PROCEDURE or private land owners (15 percent as compared to 6 percent). Certified *ejidos* also are more likely to have a written internal rule (63 percent as compared to 30 percent).

Table 6: Subjective perceptions regarding the impact of Procede

	Change due to Procede	
	More	Less
Tenure security and factor market participation		
Problems with land tenure security	5.0%	28.0%
Rental of lands	19.0%	12.0%
Land Sales	23.0%	11.0%
Migration	15.0%	8.0%
Access to credit	12.0%	8.0%
Productive investments	5.0%	4.0%
Ejido characteristics		
Social unity in the <i>ejido</i>	21.0%	12.0%
Participation in associations	5.0%	4.0%
Land consolidation	3.0%	2.0%
Land subdivisions	4.0%	2.0%

Source: 1997 *Ejido* survey (based on 1291 *ejidatarios*)

More tenure security for *avecindados* and *posesionarios*. An important equity impact of the program is the recognition of *avecindados* and *posesionarios* who previously often had very limited rights and precarious security of tenure. As a result of the program, certified *ejidatarios* receive titles to their plots and to their use of common lands. Since, in the process, *ejidos* are also able to accept additional members based on actual occupation, the program had an important impact on equity, resulting in the formal recognition of occupancy rights for more than 1 million households who previously did not have any property rights. A significant result of PROCEDURE is the formal recognition of the title to land given to individuals who previously lacked it, in particular *avecindados* and *posesionarios*. During the final assembly, these individuals are assigned titles to the agricultural and urban land they possess respectively. In both cases PROCEDURE is the first instance in which this recognition can occur. In fact, both *avecindados* and *posesionarios* achieved legal validity only in the context of the 1992, and have to be confirmed by the formal recognition through the assembly. For *posesionarios*, PROCEDURE means that their occupancy of the *ejido* land is guaranteed, and therefore that after at least 5 years of occupancy (or

10 if the occupancy was in ‘bad faith’) they can be recognized as *ejidatarios*. In the case of *avecindados*, PROCEDURE confers immediately full ownership over their urban plots.

Few ejidos have decided to allow the *dominio pleno*. Being an important precondition for obtaining the *dominio pleno*, PROCEDURE was opposed by its detractors for the fear it would have led to the dissolution of the *ejidos*. However, only very few of the *ejidos* (less than 1 percent) have allowed its members to adopt the *dominio pleno*. The few *ejidos* that adopted the *dominio pleno* are mostly located in the peri-urban areas and their main interest has been that of selling their lands at a higher price. *Ejidors* located in rural areas do not have similar motivations and irregular land sales do not involve significant penalties. Second, *ejidatarios* may fear to incur into land taxes. Although sales of lands newly incorporated in the private regime are exempt from taxes, private land is subject to land taxes. As *ejidos* are excluded from such taxes, this may represent an important disincentive to the adoption of the private regime without a specific reason, such as selling the land. Anecdotal evidence suggests that fears of having to pay taxes have been an important factor that did not only prevent communities to adopt PROCEDURE, but that also prevented individual land owners from completing the procedures for obtaining *dominio pleno*, and in some cases to enter into contracts that were decidedly disadvantageous. While better dissemination of information will be one way to deal with the issue, it is also important to look at the issue of tax treatment of the private and social sector in the broader context of local government finance and equal treatment of rural producers. While this is a controversial topic, eliminating differential treatment of the two sectors (and valuing the in-kind contributions that many *ejidatarios* make to this end) not only could make a significant contribution to increased accountability of local governments and to a fairer system of taxation, but also to the sustainability of the accomplishments of the program.

Advance of PROCEDURE in indigenous areas has been complex: It is true that PROCEDURE has advanced less in indigenous *ejidos* and communities than in others. However, the fact that an indigenous dummy is insignificant in a regression of PROCEDURE adoption, as discussed in more detail below, suggests that limited adoption are due to the presence of conflicts, inequality in access to land and resources within the community, and lack of economic profitability and human capital development rather than specific “indigenous” character of the ejido. This, as well as the evidence that there are few if any differences between certified *ejidos* located in communities with high levels of indigenous presence and those in non-indigenous municipalities (Robles, 2000), suggests that adjusting the process of PROCEDURE to the specific character of indigenous communities, e.g. the presence of boundary conflicts and efforts to reclaim lands that were appropriated or invaded by neighboring communities or private farmers, may be appropriate. Of course, cultural factors would affect the way in which this would have to be done (e.g. in implementing alternative means of conflict resolution), but evidence does not suggest that the mechanisms for implementation are completely unsuitable for indigenous lands.

3.4 Institutional arrangements

Based on the understanding of the accomplishments thus far, it is important to see what the challenges are and how the different institutions are equipped to deal with them.

3.4.1 Major institutions and overall budgets

Justification and background. While one of the major tasks of the agrarian institutions in Mexico has been the implementation of PROCEDURE, an understanding of the institutional structure, and in particular the vision for a possible arrangement after the completion of this program, requires a broader view at mandates and accomplishments by different sector institutions. To deal with this, we provide an overview of the Agrarian Sector of the Public Administration which includes the SRA, the PA, and the RAN. We then examine those institutions that form the system of Agrarian Courts (TAU and TSA), and successively those that form the inter-institutional network and that deal with specific issues relevant to the agrarian sector.

A decreasing overall resource envelope: Before discussing specific functions and responsibilities, it is necessary to view the availability of resources for this purpose. As Table 7 illustrates, institutions involved in the agrarian sector, but in particular the SRA, have seen a considerable downward trend in the availability of resources to them over the last 5 years. Using the figures for 1999, which is the last year for which actual spending is available, one notes that in this year the budget available to the SRA was less than 20 percent of the 1995 budget (and only slightly more than 10 percent of what had been available in 1996), and that the PA and the RAN, while having a more stable budget overall, had experienced budget cuts in the order of 30 percent. At the same time, the budget for the *tribunales agrarios* shows a continuous increase, being more than double than the 1995 level in 1999, with a further expansion for the year 2000.

Table 7 -- Mexico: Current Budgets of Agrarian Institutions 1995-2000
(Thousands of constant Mexican pesos, base year 2000)

	1995	1996	1997	1998	1999	2000*
SRA	2,449,167	4,485,248	1,587,490	1,066,253	463,239	614,981
PA	988,299	769,048	696,431	685,811	644,379	629,630
RAN	655,000	511,544	453,264	420,938	464,928	438,720
FIFONAFE				26,660		
Tribunales Agrarios	312,060	289,521	303,536	367,048	410,144	440,200

* Presupuesto Modificado

SRA: Secretaria de Reforma Agraria; PA : Procuraduria Agraria; RAN: Registro Agrario Nacional

Source: 1995-1996: Cuenta Publica Federal; 1997-1999: Decretos Aprobatorios del PEF.

3.4.2 The Secretaría de Reforma Agraria

Evolution. The SRA was established in 1974 to represent the executive branch in shaping and administering agrarian policies. Pre-1992, it was centered on the process of land redistribution where the SRA played a central role in three areas, namely (i) examination of the merits of the claims over specific lands advanced by its possessors; (ii) assessment of requests for the concession of lands to landless rural dwellers; (iii) expropriations of land in those cases of public interest; and (iv) other issues related to land administration and entitlement of rights to the land. The SRA had judiciary competencies which have hence been transferred to the Agrarian Courts. In line with the principle of reducing the control of the executive power over the social sector, the SRA was assigned the role of coordinating the development of agrarian policies, especially the Regularization of Rural Property (*Ordenamiento de la Propiedad Rural* or OPR), and to bring about a speedy resolution of any outstanding legal claims (the *Rezago Agrario*) from the past.

Main areas of activity. Currently, the institution's mandate comprises three main areas, namely land regularization and management of government land; inter-institutional coordination, and contribution to agrarian development. Within the first category, it has a number of specific tasks, namely (i) completion of the juridical and administrative duties derived from the previously existing *Ley Federal de Reforma Agraria*; (ii) regularization of lands possessed by farmers without title; (iii) demarcation and measurement of *baldios*; (iv) reclamation and/or declaration of the latter as national lands; (v) resolution of cases of land ownership exceeding the constitutionally prescribed limits; and (vi) determination and administration of the expropriation of social land for purposes of public utility. In the second category, the SRA has had some role in coordinating PROCEDA, but its role in setting broader agendas for the agrarian sector has been quite limited. Concerning agrarian development, the SRA's role has been quite limited, due to budgetary shortfalls as the funds which the laws foresaw to become available for improved functioning of land markets were never made available. While the idea was to have the SRA to provide financial assistance to developmental projects in cases where land redistribution was no longer feasible, delays in the establishment of the necessary funding, the *Fondo de Apoyo a Proyectos Productivos de las*

Organizaciones Agrarias (FOAPROA) which was operational only in 2000, prevented a big impact. In the meantime, a total of 405 projects have been approved, with an estimated 13,000 beneficiaries and a creation of 65,000 jobs. Finally, a main line of activity for the SRA has been the solution of land disputes in Chiapas following the EZLN's insurrection in 1994⁴⁹ and of the need to complete the *Rezago Agrario*. In doing so, the SRA has helped to establish 453 new *ejidos* and communities, providing rights to over 243,000 hectares of land to more than 24,000 families.⁵⁰

Effectiveness and assessment. Due to the severe budget cuts experienced by the SRA, a number of tasks that were by law assigned to the SRA were actually taken over by other sector institutions, especially the PA and SEDESOL. However, since the characteristics of remaining *ejidos* will require increased attention to conflict resolution, it may be more prudent to have the PA concentrate on this, while allowing the SRA to take the lead in policy formulation, in addition to taking care of some of the uncompleted tasks such as the measurement and registration of unused and national lands of the agricultural colonies. The SRA does not appear to have a clear advantage in implementation of development programs, suggesting that the most appropriate strategy would be to try to accomplish this goal through collaboration, or even contracting out to other agencies. This would allow the SRA to devote more energy to policy coordination, something that will acquire increased importance especially once PROCEDA has been completed. Although the detailed functions to be performed will require further analysis, it should be noted that this may require intellectual leadership more than a large operational budget.

3.4.3 *The Procuraduría Agraria.*

Mission. The PA is a decentralized institution with juridical autonomy and an independent endowment (or *patrimonio*). It has its headquarters in the Federal District and offices in 32 States, besides having 123 local offices that allow a better contact with the rural communities. Its basic mission is to defend the legal rights of the *ejidatarios*, *comuneros*, their heirs, *ejidos*, *comunidades*, small private farmers, and *avecindados*. There are five main functions of the PA, namely to (i) legally represent agrarian subjects in court; (ii) promote the conciliatory solution of disputes related to the agrarian law; (iii) monitor the observance of the agrarian law; (iv) provide legal counseling to the agrarian subjects on matters related to the agrarian law and on several economic issues related to the administration of the *ejidos* and *comunidades*; and (v) assist the agrarian communities in the program of land titles certification (PROCEDA). In its function of providing legal assistance, the PA supervises the issuance of licenses and permits needed for the exploitation of the natural resources owned by the *ejidos*. When these *ejidos* plan to participate in commercial firms with their common lands, the PA is required by law to represent *ejidatarios*, i.e., to examine the existence of evident benefits for the *ejidatarios*, and to ensure that the rights of the *ejidatarios* and of the *ejido* have been respected.

Areas of activity. More by default than by design, due to the budget shortfalls of the SRA, the PA has taken a major role in participating as a coordinator of the institutions involved in PROCEDA, something that has constituted a major effort. The PA has also participated in over 126,000 court hearings resulting in a 90 percent success rate for its clients. In addition, it performs the valuable role of negotiating conflicts between opposing parties in an effort to avoid recourse to Agrarian Tribunals. It is likely that without the PA's intervention, it would have been impossible for the system of Agrarian Courts to deal with the flood of cases. In fact, the PA has mediated in over 175,000 cases, resulting in a resolution in 63 percent of cases. In the diffusion of new legal tools required by the reforms (e.g. to administer more transparently the internal life of the *ejidos*), the PA has achieved important results. The PA certifies (on the basis of the documentation filed at the RAN) the existence of the agrarian rights over the land. The PA

⁴⁹ Even though the explosion of the conflict in Chiapas is often attributed to the 1992 constitutional reforms, most observers agree that it was triggered by other factors such as the signing of the NAFTA.

⁵⁰ The most complicated event was the management of the conflicts that arose as a consequence of the invasion of over 70,000 hectares of privately owned land in the Cañada region. As part of the process, the SRA had to investigate whether these private properties exceeded the limits imposed by the Law, and had to consider the claims for the redistribution of land advanced by over 280 rural organization. The outcome was the acquisition by the SRA of about 250,000 hectares of land that were subsequently redistributed to 61,000 families residing in 196 communities.

has received over 430,000 legal assistance requests and completed the examination of over 398,000; roughly a 90 percent response rate. Detailed budget figures that would allow to cost these activities more precisely are unavailable.

Assessment. If the SRA will be able to more effectively comply with this mandate, or once PROCEDE is completed, the PA will need to reorganize its efforts to focus more specifically on legal assistance. The importance of out-of court conflict resolutions is likely to increase as PROCEDE extends to areas that are characterized by higher levels of conflict. To do so, specific training and possibly also adjustments in the institution's staffing structure are likely to be needed. The budgetary requirements for doing so may need to be spelled out in more detail.

3.4.4 *The Registro Agrario Nacional.*

Mission. The RAN is a de-concentrated institution with three main areas of responsibility, namely (i) to register transactions that modify existing rights over social property; (ii) to provide technical and cadastral assistance; and (iii) to archive and preserve the historical documentation on land entitlements and the documentation produced as a result of PROCEDE. The ability to provide documentary evidence of land ownership has proven critical for *ejidatarios* to assert their land rights against any type of challenges.

Activities: The first set of functions is particularly important in view of the substantial efforts and costs incurred in titling the social land through PROCEDE. *Ejidatarios* are required by the LA to notify the RAN about changes in property due to sale, cession, or any other permanent form of transference of rights. They are required to deposit at the RAN their list of heirs and to communicate their decisions for adopting the *Dominio Pleno* (DP), once the *ejido* assembly has satisfied all of the legal requirements prescribed by the Law. Moreover, the RAN has to be used to register ventures that involve *ejidatarios* and/or other non *ejido*-members (which could be either individuals or firms). In particular, the RAN will also register the holders of the so called T-shares, which represent the amount of shares to which the *ejidatarios* or the *ejido* are entitled to in virtue of the value of the social land that is contributed to the joint venture. The RAN also needs to be notified of any expropriation of social land and has the responsibility of registering and certifying existing unused lands and agricultural colonies. Concerning the second set of functions, the RAN participates in PROCEDE by providing the guidelines that the PA and the INEGI need to follow in measuring and titling common lands, individual plots, and urban plots. To this end, the RAN expedites the Technical Norms for the Delimitation of the *Ejido* Lands. Finally, the RAN produces and delivers the documentation generated as a result of PROCEDE. It archives this documentation and preserves it so as to provide the legal basis to the property rights inscribed. Legal documents produced before 1992 and as a result of the *Rezago Agrario*, (in other words as a result of the original process of land distribution), are also the responsibility of the RAN. In sum, the RAN is the sole institution with the authority to certify the rights attached to a given tract of social land and to keep the transaction in official records.

Assessment: There are three issues, namely (i) the costs involved in the completion of PROCEDE; (ii) the risk that the information generated by the certification process will become obsolete due to lack of continuing registration, and (iii) the scope and feasibility for merging the RAN with the Public Registry.

Completion of PROCEDE: With the transfer of the relevant skills to the RAN, the participation of INEGI to PROCEDE is being terminated and the RAN will be responsible for providing the necessary information, measuring the land, and issuing the ensuing titles. Although additional budgetary resources have been included in the 2001 budget, it is not clear whether these will really be sufficient to support those functions inherited from the INEGI. Also, since large part of the non-regularized *ejidos* are located in marginal lands, it will be necessary to actively look for lower-cost mechanisms to ensure the expeditious implementation of PROCEDE in the remaining *ejidos*, including a strong emphasis on alternative mechanisms of conflict resolution.

Preventing obsolescence of titling information: A second major issue in the future is the risk of ‘obsolescence’ of the whole process of land certification. Casual evidence suggests that many of the transactions of regularized land are not properly registered, risking the obsolescence of a data infrastructure that has been established at a high cost. The challenge is to reduce the cost of registration, e.g. through itinerant updating but also through efficient (decentralized) management of the RAN, to eliminate disincentives to doing so, and to disseminate the advantages of having formal land records. The RAN needs to be involved at the outset in any effort at addressing this problem.

Consistency between RAN and the Public Register. Even though there are great differences across states, it appears that in many states, the *Registros Públicos* are less technologically advanced and comprehensive than the RAN, which was originally established to provide a method of registration for the social sector. Whether it is appropriate to have two separate registries or whether this entails wasteful duplication and contributes to tenure insecurity is an issue that can not be answered on the basis of this study. However, it is clear that the advantages of unifying registry information and the establishment of a national cadastre, would merit further investigation, especially if it could be linked to decentralization, the maintenance of the field information on permanent basis, and improved accessibility of the RAN. Irrespectively of the outcome of this discussion, mechanisms for efficient sharing of information between different institutions should be actively pursued.

3.4.5 *The Agrarian Courts (Tribunales Agrarios Unitarios and Tribunal Superior Agrario)*

Mission and structure. The system of Agrarian Courts is a key element in the new vision of the agrarian sector embodied in the 1992 reforms. The central goal of the LA is to establish a system in which the certainty of legal rights is strongly and expeditiously enforced. The PA has an important role in promoting the LA among agrarian subjects and in supporting an efficient development of the system of agrarian justice through negotiation and technical assistance. However, when negotiation fails, the *Tribunales Agrarios* have an important role in defining and enforcing these rights. Pre-1992, disputes over claims to land were solved by the administrative authorities. After the 1992 reforms, these are solved in front of a judiciary authority that has complete jurisdiction. The LA assigns the *Tribunales Agrarios Unitarios* (TAU) functions of adjudicating conflicting claims over land after the 1992 reforms, such as disputes that could not be solved by PROCEDE, and of solving those cases pertaining to the pre-1992 reform period and which constitute *Rezago Agrario*. As indicated earlier, the *tribunales* are the only agrarian institution that has seen its budget increase substantially during the 1995-2000 period.

A second level appeals court, the *Tribunal Superior Agrario* (TSA) has the competencies of examining appeals against first sentences that involve the borders between *ejidos* or communities or between these and that of small farms or associations, the restitution of social lands, and resolutions dictated by agrarian authorities. In addition, it is responsible to solve conflicts over the TAU’s competencies and to build up a body of jurisprudence.

Assessment. The establishment of a system of agrarian court has been essential to de-politicize land issues to ensure application of objective criteria to resolving conflicts, and to deal effectively with the backlog of cases (*Rezago Agrario*) which, if unresolved, would have threatened social stability and peace in the countryside on a larger scale. Experience shows that quick implementation of court decisions is a key factor. In view of the fact that the importance of the cases related to the *Rezago Agrario* will decrease over time, one would expect a decline rather than an increase in the level of funding available to the *tribunales*, especially given that court proceedings are unlikely to be the most efficient way of dealing with many of the conflicts arising in the countryside. Policies should therefore aim also at eliminating sources of conflicts, establish incentives that are in line with use of the *tribunales* as a means of last resort, and increase efficiency of the *tribunales* in dealing with conflicts. Regarding the first, cursory review of the sources of conflicts suggests that a large share of the disputes brought before the *tribunales* has its origin in inheritance matters, often originating in circumvention of the prohibition of subdivision upon inheritance. Modifying the legislation that prohibits such subdivision could be an effective way to

greatly reduce the amount of disputes arising in the countryside, especially if it is combined with the establishment of extra-judicial avenues that would allow speedy resolution of existing conflicts. Second, to provide broad access, the services of the *tribunales* are provided free of cost, even for the party who loses the case, something that often encourages frivolous litigation. While the principle is laudable, there may be other factors preventing broad access to the *tribunales* that need to be dealt with. Doing so might at the same time allow to establish a more incentive-compatible cost structure. Finally, even though the fact that all proceedings are conducted orally has greatly increased access, there may be scope for streamlining procedures so as to reduce costs and increase the number of cases that can be heard at any given time (Zepeda, 2000). Changing the procedures in ways that discourages a multiplication of frivolous cases and to speed up the judiciary proceedings, without compromising access, would be an important issue for the future.

3.4.6 *Corett and PISO (Comision para la Regularizacion de la Tenencia de la Tierra, Programa de Incorporación del Suelo Social al Desarrollo Urbano)*

Rationale and mission. About two thirds of the land that is needed for urban expansion is in the social sector. At the same time, illegal urban or peri-urban settlements is widespread not only in the 1,119 communities located within the major cities but in almost one third of all *ejidos* and communities (INDA, 1996). In the large majority of cases (72 percent), no steps to resolve the problem had been undertaken. The *Corett* (created in 1974) is a decentralized parastatal institution dealing primarily with the problem of illegal urban settlements and the invasion of social and federal land. Its responsibility is to regularize illegal settlements, support local governments in actualizing the *Registro Público de la Propiedad*, and providing technical support to *municipios* and states for the incorporation of land in the expansion of urban areas, fostering the participation of the social sector as supplier of land, and provide new urban dwellers with access to suitable areas. While before 1992 expropriation has been the only form of incorporating these areas into urban development, a number of legal provisions (e.g. the requirement that municipalities form territorial reserves for urban expansion, conduct environmental planning, and coordinate with the Agrarian Law) have been promulgated to provide the basis for long term planning of the expansion of urban areas. Therefore, three additional modalities are available to incorporate social land in peri-urban development:

- *Adoption of dominio pleno:* Once PROCEDE has been completed, the assembly can authorize the *ejidatarios* to adopt the *Dominio Pleno*. Private land can then be sold to urban developers provided the seller has first granted the right of first refusal to family members and the *ejidatarios*. In addition, if the lands are located within areas for housing as designated by the municipal urban expansion plans, the municipality has the right of refusal. In this context, *ejidatarios* that switch to the private regime can, on an individual basis, bring their lands to an urban development firm either alone or in a joint venture with private capital;
- *Establishment of sociedades mercantiles:* Certified *ejidos* can, after allowing the PA to emit a non-binding recommendation, decide to confer part or all of their lands to a mercantile company either alone or in partnership with external private capital.
- *Plan for urban settlement:* *Ejidos* that did not undergo PROCEDE can decide to assign their common lands to urban settlement, provided they follow the guidelines established by the RAN for the issuance of a plan or project that delimits these lands and specifies their use. Successively, these lands are conferred to the constitution of an urban development firm;

Activities: Under the traditional regularization process, the land to be expropriated is identified and acquired, thereby bringing it under private tenure. If the land is owned legally by an *ejido*, *ejidatarios* or *comunidad*, these are compensated at a 'social' price that is normally well below the market value. To improve this situation, *Corett* has in 1996 started to operate a program, PISO (*Programa de*

Incorporación del Suelo Social al Desarrollo Urbano) in the country's main cities. The main purpose is to open up channels of urban land development other than expropriation. To do so, *Corett* collaborates with FIFONAFE and the PA to promote the formation of *Sociedades Inmobiliarias Ejidales*, or the adoption of the *dominio pleno* and subsequent development of the land either directly, through the *Corett* or through municipal authorities. Since its foundation 27 years ago, *Corett* has regularized and incorporated into urban areas over 136,000 hectares of rural land, creating 2.3 million plots occupied by over 10 million people. Under PISO, over 88,000 hectares of land have been incorporated in areas for future urban development. *Corett* has also begun incorporating new areas into territorial reserves to be destined for future urban development, either by buying them directly from its owners or by the traditional means of expropriation. To increase the speed of making available land for peri-urban development, *Corett* has been transferred from the SRA to SEDESOL in 1999.

Assessment: It is widely believed that joint ventures for the urban development of *ejido* lands would be a more efficient and equitable way of urbanizing these lands. Yet, joint ventures in which private firms participate by conferring the capital endowment needed for investing on *ejido* lands have not proved a successful option, due mainly to two reasons. First, the share of peri-urban *ejidos* who have adopted the *dominio pleno* has been limited, partly because of administrative obstacles involved and partly because, due to the presence of conflicts, a huge share of *ejidos* in peri-urban areas has not yet undergone PROCEDURE. For those that have been regularized, lack of management skills, entrepreneurial experience on the part of the *ejidatarios*, as well as problems of coordination, trust, and quick decision-making in day-to-day management of the enterprises have proven to be a major obstacle. Improving capacity and providing venture capital for the startup of such enterprises, possibly through acquisition of an equity stake that can subsequently be sold, may be an important opportunity for improving the prospect for establishment of such enterprises. Additional avenues that would include not only capacity building but also the option of fast-tracking conflict resolution and adoption of the *dominio pleno* should be explored.

3.4.7 National Trust Fund for the Development of the Ejidos (FIFONAFE)

Mission. FIFONAFE is a trust fund established with the purpose of administering funds that belong to *ejidos* or *comunidades*. In its present form, it is the result of changes required by some of the new provisions of the 1992 reforms to the pre-existing *Fondo Comun* (Common Fund) instituted by the Agrarian Code (1942). Originally, the purpose was to administer revenues obtained from the exploitation of communities' natural resources which would be used to finance investments in infrastructures, both urban and rural, or for the acquisition of capital goods who would be owned by the *ejido* collectively. In recent years, another important source of funds for the *Fondos Comunes* were indemnities from expropriation of *ejido* lands for public interest. By law, these proceeds are to be deposited preferably with FIFONAFE (art 95), and have to be shared by *ejidatarios* affected by the expropriation according to the size of their individual plots.

Activities. The sums redistributed through FIFONAFE have been considerable. About 4,600 *ejidos* and *comunidades* (almost 15 percent of the total number of the social sector) have funds committed in FIFONAFE for a total of MXP 528 million. Since 1995, 4,278 communities, representing about 760,000 *ejidatarios*, have received a total MXP 1,111.4 million from the Fund. In terms of reversion of expropriation, FIFONAFE has been involved in the revision of 5,477 decrees and in 139 judgments in the agrarian courts. In addition, FIFONAFE has sponsored a program in support of female rural entrepreneurs in which MXP 80 million were used as loans to support the start-up of 1,364 rural based enterprises, with a high loan recovery rate. FIFONAFE, as a common fund, seeks to create appropriate incentives for the communities to invest in the most productive way the indemnities received for expropriation of their lands. The large sums it manages are ample evidence of the economic impact of the expansion of urban areas on social lands, a theme to which we shall return to with more detail in section 4.

FIFONAFE's involvement in the incorporation of social land into expanding urban areas could prove critical in channeling part of the increased value of newly urbanized lands to the *ejidatarios*. For *ejidatarios* and *comuneros* to appropriate the increased value of their lands, it is desirable to provide institutional support so as to expedite the process of tenure transformation (from *ejido* or communal to the *dominio pleno*), and to form *Sociedades Inmobiliarias Ejidales* with which to increase their properties' values. To provide these services, FIFONAFE and the PA have participated in the *Programa de Organizaci3n y Capacitaci3n de los Sujetos Agrarios para el Ordenamiento de la Propiedad Social para Uso Urbano*. Through this program, 80,000 *ejidatarios* belonging to 1,021 communities have received training. The aim is to extend the program to the communities that are going to supply the 500,000 hectares to the 116 most important urban areas within the next 20 years.

FIFONAFE also attempted to finance startup of joint ventures, especially in urban areas, by advancing funds against the eventual sale of real estate in the final venture. Under this program, FIFONAFE has lent start-up funds of up to MXP 300,000 at a preferential interest rate to facilitate the establishment of *Sociedades Inmobiliarias*. In case of default, FIFONAFE will exercise the right to sell the land offered as a guarantee. This experience has not been a complete success. In fact, few *inmobiliarias* have been formed, partly due to the fact that the cost of launching such an enterprise is more than three times the maximum loan size that can be obtained, as well as due to administrative problems. Eliminating the bureaucratic obstacles, and developing sustainable business models, possibly through a pilot operation in municipalities with high levels of interest by local government, would be an important avenue to make better use of this potential, and to provide a model for addressing the still largely unresolved issue of incorporation of *ejido* land into urban development and provision of affordable housing.

Assessment: The issue of creating conditions to facilitate a prompt supply of social as well as private lands for provision of affordable housing, within the boundaries of the "territorial reserves" that have been established by municipal governments, remains a high priority. To this effect, state governments and SEDESOL need to ensure that municipalities establish coherent and well-publicized plans for future urban expansion. Where technical expertise is lacking, SEDESOL should consider financing substantial institutional support to avoid delays which could perpetuate the practice of irregular settlements, only to resort to *Corrett's* regularization *ex post*. It is vital for a socially beneficial urban development that municipalities have the ability to carry out the required investments in infrastructures and facilities with reasonable timing. An ordered incorporation of social lands may give rise to significant delays during the adoption of PROCEDURE, and the formation of the consensus for the adoption of the *dominio pleno*. An approach that might be considered is allowing communities and *ejidos* included in the territorial reserves designated by the municipalities to adopt an extraordinary process, by which the conversion to the *dominio pleno* is substantially simplified or, in the extreme, mandated. Regarding the participation of *ejidatarios* in this process, the key element should be to establish a level playing field that would prevent penalizing *ejidatarios* as compared to private landowners. To overcome capacity constraints, FIFONAFE's function as counselor of that would help *ejidatarios* acquire the management skills and access to information needed to effectively negotiate with private firms. Expanding FIFONAFE's capacity to provide seed capital for such ventures, especially but not exclusively in urban areas, should be considered, provided that an appropriate incentive structure is in place.

4. *Impact of the legal changes of 1992 and PROCEDURE*

In this section we aim to assess the determinants of PROCEDURE adoption, the impact of this program on the functioning of land markets, household welfare, and access to common property resources. Key findings are the following:

- There continue to be substantial gaps between the *ejido* sector and private producers in terms of capital and land endowments, education, and use of improved seeds and machinery.
- PROCEDURE is not implemented in *ejidos* that are large, characterized by boundary disputes, internal inequality in terms of land access, illiteracy, and economic backwardness.

- Although PROCEDE does not appear to have increased credit market access and land sales market participation, land markets work significantly better in *ejidos* that have adopted PROCEDE than in those that have not.
- There are significant economic benefits associated with PROCEDE, part of them due to the ability to engage in off-farm employment. These exceed the cost, implying that the expenses made for the program can be justified economically.
- PROCEDE has also contributed to improving access to common pastures, while there is no impact on logging or collection of forest products.

4.1 Data sources and methodology

To assess the impact of legal changes separately from their implementation, we use a number of different data sources including a wide range of previous studies and background material available within the Social Sector,⁵¹ the 1994/97 survey of 1297 panel households undertaken by SAR with FAO and the University of Berkeley, and a small survey which was, together with qualitative surveys, presented to a sample of 351 *ejidatarios* and 75 private farmers in 24 *ejidos* located in 10 out of Mexico's 32 states. For the latter, data was collected by the *Procuraduría Agraria* (PA), with support from the World Bank, between July and Sept. 2000. A multi-stage and stratified process of sampling was adopted. In the first stage, rural municipalities that counted with both certified and non-certified *ejidos* were grouped into 12 clusters based on the extent of rural-urban migration; presence of irrigation; and the average size of landholdings. One municipality was then selected randomly from each of the clusters. In a second stage, two *ejidos*, one that had been certified through PROCEDE, and one that had not been certified, were selected randomly in the selected municipalities. For each of these *ejidos*, households were drawn randomly from a list of *ejido* members. To be able to compare with private producers, private farmers were selected randomly from a list of participants in the Government's *Procampo* program.⁵²

This allows to assess not only the impact of PROCEDE, but also of the reforms in the legal framework, by making comparisons in three dimensions, namely

- First, before and after PROCEDE within the same household, comparing to other households in the same environment but without PROCEDE allows researchers to quantify the net effect of PROCEDE, e.g. on participation in land markets, investment, and access credit. This was done through retrospective questions.
- Second, the same analysis of impact was undertaken by comparing *ejidos* with and without PROCEDE at one or two points in time.
- Third, and finally, by comparing *ejidos* to the private sector, the researchers gained an understanding of the extent to which restrictions on marketability of land and other *ejido* rules really made a difference, e.g. on the ability to access credit.

Before initiating field-work, historical information on the evolution of area and membership, land conflicts, and productive characteristics of the *ejido* over time, was gathered from secondary sources.⁵³

⁵¹ These include surveys of the use of communal lands, the status of women in the *ejido* sector, contractual arrangements (*tratos agrarios*) to transfer the use or ownership of land, changes in the situation of *avecindados* and *posesionarios*, in addition to the rich historical material that is available from the RAN and the information on cropping patterns and land use that has been generated in the context of Procede implementation (e.g. the *Cedula INDA*).

⁵² Participation in Procampo program is very high, comprising 80% to 90% of all private producers. In view of this, use of the readily available and up-to-date Procampo lists as a sample frame for the private sector was considered to be preferable to the use of the 1990 Agricultural Census which would have required considerable re-listing.

⁵³ The main sources of such information were the *Historial Agrario*, a compendium of legislative actions that assigned land to the individuals that formed the *ejidos*, defined the changes to the *ejido*'s borders, and recorded the evictions or additions of members and land (*ampliaciones*) since the *ejido*'s foundation. Productive characteristics were obtained from the *Cedula INDA* (1996), an *ejido*-level census that records the main crops cultivated in the *ejidos*, their extensions, the natural resources to be found in their common lands, and the problems that the *ejidatarios* declared as the most pressing for their communities. For certified *ejidos*, additional information from was available from the administrative records generated

The questionnaires administered to individuals also included retrospective questions on access to credit, i.e. the first and last year in which respondents obtained credit, and a complete history of their involvement in land sales markets. We use this information to construct variables for access to credit and land purchases for the 8 years before and after 1992, as well as the farmer's land endowment in 1984 and 1992. This allows inferences about credit access and involvement in land sales or purchase markets before and after the legal change and/or the adoption of PROCEDURE.⁵⁴ As the survey did not contain information on access to common property resources, we use household-level information from a panel of 1290 *ejidatarios* who were surveyed in 1994 and 1997, i.e. before and after the adoption of PROCEDURE,⁵⁵ to deal with this aspect. A more detailed description of this sample, which is based on the 1988 *Ejido Census*, can be found in World Bank (1999).

Table 8: Characteristics of *ejidatarios* and private farmers included in the survey

	All farmers	All <i>ejidatarios</i>	Private farmers	<i>Ejidatarios</i> w/o Procede	<i>Ejidatarios</i> with Procede
Household characteristics and income					
Household size	4.11	4.06	4.36	4.32	3.84
Age of household head	40.63	40.91	39.32	39.88	41.75
Mean education of household head (years)	4.61	4.27	6.23	4.25	4.29
Per capita household income (median)	3,771	3,771	5,280	3,771	3,300
Households earning less than a minimum wage (%)	38.0%	40.0%	25.0%	35.0%	44.0%
Share of household income from agriculture	58.0%	59.0%	57.0%	54.0%	62.0%
Share of households receiving remittances	20.0%	22.0%	15.0%	23.0%	21.0%
Endowments					
Per capita land owned (median)	1.56	1.40	3.00	1.25	1.42
Per capita agricultural land (median)	1.32	1.20	2.78	0.75	1.42
Irrigation available	25.0%	23.0%	32.0%	17.0%	28.0%
Share of agricultural land with irrigation	0.28	0.27	0.33	0.17	0.33
Cattle ownership (%)	24.0%	21.0%	43.0%	18.0%	23.0%
Avg. herd size (for cattle owners)	9.73	5.62	29.00	6.57	4.2
Ownership of ag. Machinery/ equipment	21.0%	19.0%	29.0%	20.0%	18.0%
Agricultural technology					
Used fertilizer	41.0%	40.0%	48.0%	43.0%	37.0%
Used improved seeds	31.0%	28.0%	43.0%	23.0%	32.0%
Used rented/ owned machinery	34.0%	31.0%	45.0%	30.0%	32.0%
Median Corn Yields (kg/ha)	929	897	1050	1000	750
Median Wheat Yields	4274	3875	5000	4000	3375
Number of observations	426	351	75	157	194

Source: 2000 *Ejido* and private farmer survey.

The data (see Table 8) illustrate the remaining gap in productive performance between the private and social sector, together with key characteristics of the sample. Even though age and household size are similar, there are marked differences between *ejidatarios* and private farmers in land size and quality, ownership of livestock, access to technology (machinery, fertilizer, and modern seed), as well as education and per capita income levels. The median size of land owned by private farmers is 2.8 as compared to 1.2 ha for *ejido* farmers, while 32 percent of the private farmers have access to irrigation as compared to 23 percent in the social sector. The extent of cattle ownership (43 percent vs. 21 percent), the

in the process of Procede implementation. Individual interviews with *ejidatarios* and private farmers were complemented with focus group interviews.

⁵⁴ The underlying assumption is that farmers who report having had their first credit before 1984 did have access to at least one other credit in the period up to 1992. Even though the assumption seems justified, it involves only 4.3 % of the sample; it is thus unlikely to have any impact on the substantive results.

⁵⁵ There were only 15 *ejidos* who had adopted Procede already in 1994 and information from these was discarded for the purposes of our analysis.

average herd size (29 vs. 5.6), and machinery ownership (29 percent vs. 19 percent) are all much larger in the private sector where a higher share of producers (43 percent vs. 28 percent) uses improved seeds. Even though the fact that information on income was collected in a very aggregate fashion and only in broad categories implies that this information may be quite noisy, it suggests that per capita income in the private sector is higher than in the *ejido* sector. Private farmers achieve this higher levels of income through higher agricultural productivity rather than diversification into non-farm employment, a fact that is not too surprising given the geographic proximity of the sample households.

4.2 Determinants of PROCEDE implementation

Results from the analysis of determinants of PROCEDE implementation are reported in Table 9. As only slightly more than 5 percent of the sampled *ejidos* had been certified before the 1994 survey, there is little difference between figures based on *ejidos* that were certified between 1994 and 1997 and all the certified ones. We therefore report results for the latter only, noting that restricting the sample to the latter group yields almost identical conclusions.

Table 9: Determinants of PROCEDE adoption.

	Technique	
	Probit, marginal eff.	Probit, marginal eff.
Boundary problems, external	-0.369*** (4.25)	-0.327*** (3.07)
<i>Ejido</i> area (log)	-0.146*** (3.26)	-0.141*** (3.12)
Inequality of land ownership	-0.334** (2.36)	-0.322** (2.26)
Rental market partic.	0.113 (0.43)	0.096 (0.36)
<i>Ejido</i> average income	0.000*** (3.27)	0.000*** (3.28)
Literacy (%)	0.003*** (2.59)	0.003** (2.56)
Indigenous majority	-0.174 (1.34)	-0.175 (1.35)
Member of <i>ejido</i> union	-0.159* (1.83)	-0.157* (1.81)
Access to paved road	0.112 (1.14)	0.118 (1.19)
Boundary problems, internal		-0.096 (0.74)
Log-likelihood		
Observations	247	247
Pseudo R-squared	0.344	0.346

*** significant at 1%; ** significant at 5%; * significant at 10%.
Absolute value of z-statistics in parentheses.

This evidence points towards a number of key issues. Presence of external boundary conflicts, but not conflicts within the *ejido*, are estimated to be highly significant and of significant magnitude. According to the estimate, presence of boundary conflicts reduces the probability of PROCEDE implementation by between 30 percent and 35 percent. Concerning socio-economic factors, we find that membership in an *ejido* union reduces the probability of adoption, consistent with the notion that traditional structures of power have been an important factor in slowing the modernization of the *ejido* sector (Zepeda, 2000).

Finally, and quite significantly, inequality of land access is found to have a significant negative impact on the probability of PROCEDE implementation. This supports the prediction that unequal distribution of wealth and/or political power within the *ejido* will cause some more powerful people, who are likely to be lose from the more egalitarian distribution of common lands that comes about through implementation of the program, to resist its implementation. Due to the losses it would imply for powerful members, *ejidos* where land access is more unequal are less likely to adopt PROCEDE and suggests that in devising future

implementation strategies, it will be important to explicitly include measures to deal with the concerns of powerful land owners. One such issue would be to improve the program's capacity for conflict resolution, possibly by increasing the presence of the *Procuraduría Agraria* and improving the effectiveness of the *Tribunales Agrarios* in attending to specific conflicts on a priority basis. Addressing these conflicts is likely to become of increased importance as *ejidos* with conflicts can no longer be avoided. The fact that *ejidos* that are not yet certified are larger, more conflictive, poorer, more difficult to access, and endowed with less human capital than the average, will have cost implications as well. This will have to be considered in devising strategies for the completion of the program.

We also find that, as expected, *ejidos* localized in areas with better infrastructure (as proxied by access to a paved road) were more likely to be targeted for the certification, and that higher income and human capital endowments are likely to increase the likelihood of PROCEDURE being implemented. At the same time, land market participation does not have any additional explanatory power. We also find that there was no bias in implementation of PROCEDURE against indigenous *ejidos* once other physio-geographic variables are accounted for. Larger *ejidos* (measured in terms of area) were less likely to be certified, something that can be explained by the fact that internal conflicts are more likely in bigger *ejidos*, and that the authorities' goal was to maximize the number of certified *ejidos* rather than area or number of people.

4.3 Impact of legal reforms and PROCEDURE implementation on factor markets

The variables of interest in our analysis are producers' participation in rental, sales, and credit markets, as well as their use of common property resources. As our data comprise certified and non-certified *ejidos*, as well as private producers, we can compare in three dimensions. First, systematic differences between *ejidos* and the private sector will allow to identify the gap between these two types of organization. Second, by comparing the same *ejidos* (and producers within these *ejidos*) before and after 1992, we are able to identify the impact of the legal changes. Finally, if the implementation of PROCEDURE can be considered random, or driven by factors that are not related to subsequent market participation, systematic differences between certified and non-certified *ejidos* will signify the effect of the program on the variables of interest.

4.3.1 Land rental markets

Before 1992, *ejidatarios* were prohibited from renting out land under their possession; those violating this rule could have their usufruct right terminated and be evicted. Even though this prohibition appears to have been widely violated (PA 1998), land rental in the "black market" exposed households to risks and social pressures (Heath 1992; Finkler 1978), suggesting that the elimination of the restriction would affect behavior. While after 1992, land rental was legal for all *ejidatarios*, those who had undergone PROCEDURE had, in addition, a legally recognized certificate of land ownership. By increasing tenure security for the specific household, this may well have had an impact on the supply of land to the market over and above the legal change.⁵⁶ While we would have liked to estimate an equation with household fixed effects, comparing participation in rental markets before and after the legal changes, doing so was impossible because, in view of the illegal nature of rental transactions before 1992, it was impossible to obtain information on this variable. Thus, we estimate an equation of the form

$$(1) \quad N_i = \alpha + \beta E_i + \gamma P_i + \delta_0 L_i + \delta_1 E_i L_i + \delta_2 P_i L_i + \mu X_i + \varepsilon_i$$

where N_i denotes net operated land, E_i and P_i are dummies for *ejido* membership and PROCEDURE implementation, L_i is the land owned by the household, and X_i is a vector of household characteristics,

⁵⁶ Such a differential whereby legal provisions remain largely ineffective as long as they are not implemented on the ground has been reported for India (Appu 1996, Banerjee et al. 1999).

such as age and education of the household head, the number of adult household members, the dependency ratio, a dummy for ownership of machinery, and land improvements.

With constant returns to scale and well-functioning factor and credit markets, the amount of land operated should be independent of the amount of land owned, tenure status, and any other household characteristics. Households would just rent in or rent out land to obtain their optimum operated land area (see Olinto et al. 2000; Pender and Fafchamps 2000), and we would expect the coefficient on own landholding to be zero. By interacting L_i with E_i and P_i , we can thus test for systematic differences in the functioning of land markets between *ejidatarios* with and without PROCEDE, as well as private owners. The idea is that, if the derivative of the land demand function for a specific group equals zero, i.e. if (i) for private farmers $\delta_0 = 0$; (ii) for non certified *ejidatarios* $\delta_0 + \delta_1 = 0$; and (iii) for certified *ejidatarios* $\delta_0 + \delta_1 + \delta_2 = 0$ we are unable to reject the hypothesis that land markets work efficiently for this group.

Comparing between non-certified and certified *ejidos*, thus, provides an implicit way of testing whether adoption of PROCEDE has improved the functioning of land markets. Although we do not know of specific literature on the topic, *a priori* one would expect that markets function best for private farmers, somewhat less well for certified *ejidos*, and worst for non-certified *ejidos*.

While this provides a test for well-functioning factor markets, it does not give a lot of information in case factor markets do not work well. To gain such information, we complement equation (2) with estimation of a tobit equation for the amount of land rented out or rented in, respectively

$$(2) \quad R_i = \alpha + \beta E_i + \gamma P_i + \delta_0 L_i + \delta_1 E_i L_i + \delta_2 P_i L_i + \mu X_i + \varepsilon_i$$

where R_i is the amount of land rented in or out (one equation for each case). While our sample includes all *ejido* members, only operating private producers were sampled, implying that private producers who decided to rent out all their land are omitted.⁵⁷ Thus, the equation for renting in land includes all producers, allowing to compare the propensity of private farmers to rent in land as compared to that of *ejidatarios* with and without PROCEDE. Under the assumption of constant returns to scale and an unequal distribution of land ownership, an efficient land market should distribute land from large owners to smaller producers *ceteris paribus*, i.e. the slope parameter should be less than zero. In terms of the parameters, this would imply that $\delta_0 + \delta_1 + \delta_2 < 0$ for certified *ejidos*; $\delta_0 + \delta_1 < 0$ for non-certified *ejidos*, and $\delta_0 < 0$ for private farmers. *A priori*, we would expect these slope parameters to be either negative or insignificant. By comparison, the tobit for renting out land will include only *ejidatarios*, thus allowing us to identify only the impact of PROCEDE implementation.

Descriptive statistics for land market participation by *ejidatarios* and private farmers, as reported in Table 10, appear to support the broader qualitative perceptions discussed earlier. In the rental market, we note a somewhat higher level of activity in certified as compared to non-certified *ejidos*, and a higher level of renting in, presumably due to higher levels of efficiency, among private farmers. The ability to complement cross sectional evidence with a comparison of changes (in the same *ejidos*) over time allows to draw more substantive inferences for the case of sales markets. In the aggregate, we see a slight decline in land purchase markets, from 6 percent to 5 percent, and a slight increase, from 2 percent to 4 percent, in land sales, between the 1984-92 and 1992-2000 periods. Disaggregation leads to some interesting conclusions in both cases. For land purchases, the decline for private farmers and uncertified *ejidos* was countered by a slight increase (from 2 percent to 3 percent) in certified *ejidos*. For land sales, we note a considerable increase for private farmers (from 1 percent to 5 percent of the sample) as well as certified *ejidos* (from 0 percent to 5 percent of the sample) but stagnant, if not declining, market participation (from 4 percent to 3 percent) for non-certified *ejidos*. There are two conclusions of interest. First, these figures seem to contradict the hypothesis of a greatly increased number of land sales in the *ejido* sector

⁵⁷ Note that, since we are sampling from a list of all *ejidatarios*, those *ejidatarios* who rent out all their land will be included in the sample. This is less likely to be the case for private farmers.

following the changes in the law, a finding that is even more surprising in view of the fact that, since land sales were prohibited before 1992, one would expect a considerable degree of under-reporting. Second, the descriptive evidence could point towards slightly higher land market activity in certified *ejidos*, a hypothesis that will be explored in more detail below.

Evidence on the specific contractual arrangements adopted, which is not reported here as it is documented in detail elsewhere (Robles 2000), point to two characteristics. First, contrary to Central American countries such as Nicaragua where, due to pervasive tenure insecurity, land rental markets are restricted to family members and close friends (Deininger and Chamorro, 2000), such informal ties are of much less relevance in this case, suggesting a higher degree of overall tenure security. Second, in addition to most contracts remaining informal, the virtual non-existence of long-term rental contracts, together with a still very limited land sales market, may be inimical to structural change and land-related investment. This is surprising given the advanced age of many *ejidatarios*, and the scope for longer-term rental contracts to make everybody better off, which would suggest that old owners would be able to receive higher amounts of rent payments than they would be able to earn from own cultivation.

Table 10: Land market participation by *ejidatarios* and private farmers.

	All farmers	All <i>ejidatarios</i>	Private farmers	<i>Ejidatarios</i> w/o Procede	<i>Ejidatarios</i> with Procede
Land rental market					
Rents land in	10%	9%	16%	6%	11%
Rents land out	15%	16%	9%	18%	14%
Land Sales Market					
Bought land between 1984 and 1992	6%	4%	16%	6%	2%
Bought land between 1992 and 2000	5%	4%	11%	4%	3%
Sold land between 1984 and 1992	2%	2%	1%	4%	0%
Sold land between 1992 and 2000	4%	4%	5%	3%	5%

Regression results for the estimation of equations (2) and (3), respectively, are presented in Table 11. The first column contains the results of the analysis of the regression of operated land. To eliminate the impact of outliers which may unduly affect the results in our small sample, we use a median regression, with standard errors obtained by bootstrapping. There are three main findings.

First, the land endowment is highly significant and positive, while both the *ejido* dummy by itself and if interacted with the land endowment remains insignificant. This suggests that, both in the private sector and in non-certified *ejidos*, the amount of land operated is highly dependent on the amount owned, i.e. that markets do not work perfectly. Also, and more surprisingly, once other factors are controlled for, rental markets did not operate more efficiently in the private sector than in the *ejido* sector. While we can not exclude the possibility of this finding being due to the sample size in the private sector, and therefore recommend that it be confirmed with a larger number of observations, this may point to the presence of tenure insecurity in the private sector.⁵⁸

Second, the coefficient on the PROCEDE dummy is positive, and the coefficient on this dummy's interaction with the land endowment is negative and significant. This implies that implementation of PROCEDE has increased the demand for operated land and, by decreasing the dependence of operated on owned land, has helped improve the functioning of rental markets. In fact, we can not reject the hypothesis that in certified *ejidos*, but not in non-certified ones, the average household was able to rent in whatever amount of land they wanted, independently of their initial endowment, thereby adjusting to reach the optimal operational size.

⁵⁸ Such tenure insecurity could encourage households to buy (where subsequent challenges to property rights are less likely), rather than rent, with negative consequences for poor households who, while possibly being able to rent, may not be able to get access to the credit needed to buy land, a hypothesis that would merit further investigation.

Table 11: Determinants of operated land and land rental market participation

	Quantile regression	Tobit	Tobit
	Net operated land	Net renting in	Net renting out
Endowment of agricultural land	1.501** (2.37)	-0.146 (0.49)	
<i>Ejido</i> dummy	3.624 (0.81)	-203.788*** (2.98)	
<i>Ejido</i> dummy * Land endowment	-0.954 (1.35)	18.087*** (8.72)	
Procede dummy	1.358** (2.00)	287.133*** (4.62)	-6.036** (1.98)
Procede dummy * Land endowment	-0.422** (2.35)	-37.704*** (3.93)	-0.208 (1.45)
Owns machinery	1.078 (1.13)	2.734 (0.06)	7.602** (2.02)
Improvements on owned land	1.128** (2.18)	107.233** (2.47)	-1.288 (0.44)
Received Procampo	1.540* (1.89)	22.877 (0.45)	-5.454 (1.59)
Age of household head (years)	0.007 (0.42)	0.784 (0.62)	0.009 (0.12)
Education of head (years)	0.016 (0.21)	4.583 (0.68)	0.554 (1.30)
Number of adults	0.057 (0.76)	4.177 (0.71)	-0.143 (0.30)
Dependency ratio	0.350 (0.34)	52.584 (0.51)	-7.598 (0.99)
Constant	-5.428 (1.19)	-314.007** (2.41)	23.372*** (2.86)
No. of observations	358	327	283
Pseudo R-squared	0.451	0.155	0.200

*** significant at 1%; ** significant at 5%; * significant at 10%.

Absolute value of t-statistics in parentheses.

Finally, the presence of improvements on owned land, which can also proxy for the farmer's unobserved managerial ability, is positive and significant. This could imply that lack of explicit provisions in rental contracts to protect existing investments may act as a disincentive to rent out land that has associated investments. By comparison, neither ownership of machinery nor household characteristics are significant. The positive impact (at 10 percent) of the receipt of Procampo payments could imply that, during the period under concern, farmers were credit constrained and the cash payment thus received were used to acquire working capital.

If the adoption of PROCEDURE were correlated with unobserved factors that would lead to higher participation in land rental markets, the coefficients on this dummy (and the whole regression) would be biased. As the small sample of only 24 *ejidos* does not allow robust inferences on this issue, we used the 286 *ejidos* included in the FAO surveys described above to test whether the probability to adopt PROCEDURE depends on the initial level of rental activity within the *ejido*. The presence of such correlation is rejected (Deininger and Bresciani, 2001), supporting circumstantial evidence that implementation of PROCEDURE was driven more by bureaucratic imperatives of rapidly achieving high levels of coverage, than by demand from *ejidos* where the scope for the program to make a big impact was particularly high.

Estimates from the tobit regression for land rented in or out in Table 11 provide additional insights into the operation of land rental markets and the impact of PROCEDURE on the functioning of these markets, especially the differences between certified and non-certified *ejidos*. The coefficient on the *ejido* dummy is negative and significant, while this dummy's interaction with land is positive in non-certified *ejidos*, while the opposite is true in certified *ejidos* (all coefficients are significant at the 1 percent level). On the

one hand this suggests that, in line with the descriptive evidence, the demand for renting in land is higher in certified than in non-certified *ejidos*, supporting the hypothesis that PROCEDE has improved the functioning of land rental markets. On the other hand, it implies that, even though the structure of land ownership is quite similar in both types of *ejidos*, rental markets work completely differently in each of them— in non-certified *ejidos* it is the large farmers who rent in land and the small farmers who rent out, while the opposite is true in certified *ejidos*.⁵⁹

Thus, in non-certified *ejidos*, the rental market tends to contribute to land concentration instead of (as expected *a priori*) redistribution towards smaller producers. If results from other countries pointing towards an inverse farm size-productivity relationship (Bardhan, 1973; Barrett, 1996; Carter, 1984) can be transferred to the Mexican situation, this would imply that, in this situation, rental markets might actually *decrease* efficiency. By contrast, in certified *ejidos*, the exact opposite is true—the rental market is more active and distributes land towards those with lower endowments of owned land. This is consistent with the hypothesis that the implementation of PROCEDE, rather than the legal changes by themselves, increased tenure security and, by allowing small land owners to increase their operational holding size through rental, helped to bring about efficiency-enhancing land transfers.

The truncation problem created by the fact that landowners in the private sector who rented out all their land are, in contrast to *ejidatarios* who did so, unlikely to be observed, forces us to restrict estimation of renting out to *ejido* members. Column 3 of Table 11 presents the results of estimating the corresponding tobit equation (note that a negative sign means higher supply of land to the rental market). The negative and significant coefficient on the PROCEDE dummy and the negative though insignificant point estimate on its interaction with land endowments suggest that, in line with what was found earlier, certification increases land supply to the rental market, especially by large land owners. In addition, ownership of machinery significantly reduces the amount of land rented out.

To summarize, at least insofar as the rental market and operational land holdings are concerned, there is little foundation to claims that the 1992 policy reforms and the implementation of PROCEDE favored land concentration. Instead, certification of land rights appears to have increased overall demand for cultivated land, and allowed small producers to enter the market on the demand side. As noted earlier, it is remarkable that land rental markets seem to have been affected by PROCEDE implementation rather than the changes in the legal framework. In fact, it appears that legal changes by themselves were ineffective and that systematic implementation was needed to make a difference regarding the operation of the market.

From a policy perspective, this raises two issues. First, even though care should be exercised to not draw far-reaching conclusions from a very small sample of private producers, the fact that rental markets function better in certified *ejidos* than in the private sector could suggest that the extent to which lack of titles and associated tenure security in the private sector may be an impediment to smooth operation of land markets may be worth exploring further. This is in line with evidence from case studies (Robles 2000), and could suggest that avenues to improve the status of public property registers may warrant attention. At the same time, the almost universal prevalence of short term contracts, even in the *ejido* sector, suggests that activation of the land rental market alone may not be sufficient to allow an optimal adaptation to the structural change that is likely to be required for Mexico's agricultural sector in the future. Short term land rental contracts do not provide sufficient security to make long term plans and the investments required to improve the productivity of the land, be they land related (e.g. irrigation, perennial, etc.) or of a more general nature (e.g. mechanization, packing plants, and marketing arrangements). Unless land purchase markets allow rural producers to make these adjustments, an issue that will be examined below, ways to encourage long-term contracts and/or remove obstacles that would at present prevent their wide-spread use, will be an important item on a policy agenda building on the accomplishments achieved under PROCEDE. Finally, although the age of the head of the household does

⁵⁹ The presence of improvements on owned land is likely to be correlated with the operator's (unobserved) managerial ability.

not have implications for the rental decisions, it might impact the propensity to invest. This is an area on which more research may be needed, and there is a growing consensus among interested Mexican policy makers that appropriate policies may be warranted in order to promote a generational change.

4.3.2 Land sales markets

There are two reasons for wanting to explore the functioning of land sales markets separately from the market for rental. On the one hand, land ownership, or at least long-term rental, is often needed as an incentive for making long-term investments. On the other hand, imperfections in credit markets and other policy distortions will have a greater impact on sales markets than on rental. Even if land rental markets were to function well, this could lead to undesirable equity effects through speculative land acquisition by wealthy producers with good credit access, and distress sales from small landowners who are unable to access credit even for consumption smoothing. It was for this reason that critics feared that the 1992 reforms would lead to massive sales of *ejido* land, thus leading to the dissolution of the *ejido* sector and undoing the equality of land access achieved in a lengthy process of land redistribution (CAP, 1995; *Reunión Nacional de Organizaciones y Movimientos*, 1995). Available information suggests that sales have been relatively limited and that, therefore, the fear may not be justified.⁶⁰ To conduct a more rigorous test, we analyze producers' land purchase decisions before and after 1992.⁶¹

Table 12: Determinants of net land purchases, 1984-1992 vs. 1992-2000.

	(1)	(2)	(3)	(4)
	Pooled OLS	Pooled OLS	Fixed effects	Fixed effects
Time dummy	-6.205	-6.190	-10.724*	-10.723*
	(1.32)	(1.32)	(1.80)	(1.80)
<i>Ejido</i> dummy	-4.257	-3.365		
	(0.94)	(0.78)		
<i>Ejido</i> *time	6.267	5.877	10.454	10.100
	(1.13)	(1.12)	(1.48)	(1.50)
Procede	0.751	0.653	0.762	0.744
	(0.30)	(0.26)	(0.18)	(0.17)
Land holdings	-0.049***	-0.048***		-0.377
	(4.19)	(4.15)		(0.38)
<i>Ejido</i> *Land	0.102		-0.352	
	(0.64)		(0.35)	
Time* <i>Ejido</i> *Land.	-0.052		-0.041	
	(0.27)		(0.17)	
Constant	3.592	3.605	3.298	7.448
	(0.78)	(0.78)	(0.42)	(0.41)
Observations	393	393	393	393
No of households		226	226	226
R-squared			0.02	0.02
Adjusted R-squared	0.0476	0.0514		

Absolute value of z-statistics in parentheses.

* significant at 10%; ** significant at 5%; *** significant at 1%.

The results of a regression of amount of land purchased on the factors of relevance are reported in Table 12. Net purchases of land in both the pre-1992 and the post-1992 period are constructed using individuals' transaction history. Estimating the model reported in the first two columns, under the hypothesis that individual effects are random, delivers an estimate of the variance of the individual effects equal to zero, implying that we could correctly estimate the model by OLS without taking deviations from the means. This does not eliminate the need to control for unobservable individual effects that are likely

⁶⁰ However, the data maintained by the RAN do indicate that, at least as far as registered transactions are concerned, no huge sell-off of land has occurred. It would be nice if we could give some percentages for certified and non-certified ejidos.

⁶¹ We focus on land purchases as the survey does not include farmers who have sold their land and exited the agricultural sector altogether. This is not a great problem since sales out of the ejido sector were still prohibited. Also, use of land sales leads to substantively similar conclusions.

to influence land purchase decisions and results, under the assumption that these effects are fixed, and that are reported in columns three and four. Interpretation of the analysis relies on both sets of results, as OLS allow to infer the influence of landholdings whose variability over time is too low to display any significance in the transformed fixed-effects model.

First, the data reject the notion that both the 1992 reform – permission to sell land to other *ejido* members – and PROCEDE as an additional factor have resulted in a massive sale of land. Being an *ejidatario* does not result in a higher participation in the land market, whether one belongs to a certified or non certified *ejido*, and independently of the time period considered (i.e. before or after 1992). Thus, the reforms did not lead to a wave of land sales as detractors of the reforms feared⁶². Second, there is evidence that since the reform land purchases have decreased irrespective of the tenure status. This is consistent with the notion of a stagnation in the agricultural sector, possibly due to the restructuring of the credit system or to an overall depression of the sector's profitability, following the removal of government interventions in commodity and input markets, and as a consequence of the reduction of tariff protection following the liberalization of the sorghum market and NAFTA (Mhyre, 1998). Third, we note that net purchases of land are negatively related to the amount of owned landholdings, independently of tenure status. This clearly leads us to reject the hypothesis that sales markets have led to land concentration. Finally, the regression suggests that PROCEDE did not have an appreciable impact on land sales market activity, in contrast to its impact on land rental markets.⁶³ In interpreting the result, one has to bear in mind that, by aiming to compare certified with non-certified *ejidos*, our sample is not nationally representative, but instead over-emphasizes relatively marginal areas with a presence of non-certified *ejidos*. Bearing this limitation in mind, our findings nonetheless support the conjecture that, as generally reported in the literature, it is more difficult to activate land sales markets than to get land rental markets going. Where sales of *ejido* lands are likely to be important in the future, i.e. especially in peri-urban areas, it is therefore important to make all participants aware of their rights in order to achieve outcomes that are satisfactory from an efficiency and an equity perspective.

4.3.3 Credit access

Given the low level of productive assets in the *ejido* sector in comparison to private producers highlighted in the descriptive statistics, higher levels of investment, and access to credit, would be important for productive development of the sector. Indeed, hopes for land certification to increase *ejidatarios'* access to formal credit were a driving force behind the 1992 reforms. As adoption of *dominio pleno* is contingent on having completed the process of certification, PROCEDE would appear to be a necessary condition for improved credit access. However, remaining restrictions on the marketability of land that formally continue under the *ejido* regime –i.e. without making the transition towards *dominio pleno*– imply that PROCEDE may be a necessary but not sufficient condition for better access to credit markets. The reason is that, though it provides ownership to home lots, it only recognizes usufruct to agricultural parcels, something that may not be an attractive collateral for formal lenders. If this is the case, the impact of both the legal reforms and the implementation of PROCEDE on credit access may be limited.

Table 13 provides descriptive statistics regarding credit access, for the whole sample and for the sub-groups of interest. One notes that there has been a general decrease in credit availability, with 22 percent of producers having received credit in the 1992-2000 period, compared to 25 percent during 1984-92. While the descriptive statistics suggest that the decrease in credit use was slightly lower in certified than in non-certified *ejidos*, they also caution against premature conclusions from cross-sectional evidence; as illustrated in Table 13, certified *ejidos* seem to have had slightly higher credit access already before introduction of PROCEDE, suggesting that other factors may be at play as well.

⁶² Other factors such as ownership of machinery and access to irrigation have a significant and impact as well.

⁶³ The fact that Procede is insignificant not only in the panel but also in the OLS regression suggests that this is not a function of the estimation technique.

Table 13: Access to credit markets by *ejidatarios* and private farmers.

	All farmers	All <i>ejidatarios</i>	Private farmers	<i>Ejidatarios</i> w/o Procede	<i>Ejidatarios</i> with Procede
Credit market access					
Obtained credit during 1984-92	25%	23%	35%	20%	25%
Obtained credit during 1992-2000	22%	20%	29%	17%	23%
Type of credit obtained (last year **)					
Short term	82%	83%	77%	93%	78%
Long-term	12%	11%	14%	7%	13%
Individual	62%	60%	68%	56%	62%
In group	33%	35%	27%	44%	29%
Credit source (last year)					
Banrural	36%	32%	50%	11%	44%
Commercial Bank	4%	1%	14%	0%	2%
Buyer of produce	4%	6%	0%	4%	7%
Collateral used					
Land	26%	18%	50%	4%	27%
Harvest	4%	6%	0%	15%	0%
Animal	1%	0%	5%	0%	0%
Machinery	6%	8%	0%	4%	11%
Other	3%	4%	0%	4%	4%
Rejection of credit					
Solicited credit after 1992 and was rejected	11%	10%	13%	13%	9%
Lack of collateral	16%	14%	20%	16%	13%
Not affordable	13%	3%	50%	0%	6%
Insufficient project quality	11%	11%	10%	21%	0%
Personal/ political	7%	9%	0%	5%	13%
Unpaid credit	4%	6%	0%	0%	13%

Source: 2000 Ejido and private farmer survey.

Complementing the statistics on aggregate credit use with evidence on the modalities of such credit for the different groups during the 1999/00 season suggests that the modalities under which certified *ejidatarios* are able to access credit are similar to those in the private sector, and somewhat better than those available to members of non-certified *ejidos*. Even though most of the credit obtained was for the short term, between 13 percent and 14 percent of private farmers and certified *ejidatarios* (as compared to 7 percent in the non-certified sector) had access to long-term credit. Also, while 44 percent of non-certified *ejidos* accessed credit as a group, the corresponding percentage for private farmers and certified *ejidatarios* was only 27 percent and 29 percent, respectively. Certified *ejidatarios*' access to private credit (i.e. buyers and commercial banks) is higher than for non certified *ejidatarios* (9 percent versus 4 percent), although below that of private farmers (14 percent). Despite the legal limits on the ability to use land as a collateral, 27 percent of certified *ejidatarios* (vs. 50 percent of private sector producers and 4 percent in non-certified *ejidos*) used land as a collateral for obtaining credit. The use of land by *ejidatarios* as a guarantee for obtaining credit is likely to reflect the practice by rural banks to take possession of land titles as a mean to exert pressure on the borrower, rather than of insuring effectively against borrower's default.

Are the suggestions emerging from descriptive analysis borne out by econometric analysis? Results on credit access from a pooled probit (columns one and two) and a fixed effects logit are presented in Table 14. As in the case of land sales market participation, we note a highly significant and quantitatively important decrease in the probability of accessing credit over time, even in the fixed effects regression. Second, there is *no* difference between *ejidatarios* and private land owners once other factors, such as ownership of other assets that can function as collateral substitute, are controlled for. This suggests that, during the period under concern, land tenure in the *ejido* sector was not the main constraint to credit

access.⁶⁴ PROCEDURE is not found to have a significant impact either, suggesting that the ability to use the usufruct to a well-demarcated parcel of land as collateral did not increase *ejidatarios'* ability to access formal sources of financing⁶⁵. Finally, and somewhat surprising, the amount of land owned does not affect access to credit, suggesting that reduced availability of credit affected the whole sector, rather than only a limited segment of small producers.

Table 14: Access to credit before and after 1992

	Pooled		Panel
			Fixed effects
Time dummy	-0.379** (2.45)	-0.332*** (4.14)	-2.667** (2.31)
Ejido dummy	-0.111 (0.75)		
Procede dummy	-0.074 (0.64)	-0.087 (0.85)	-3.713 (1.51)
Time*Ejido	0.052 (0.26)		
Owens machinery	0.258*** (5.22)	0.256*** (5.17)	2.531** (2.25)
Land owned in ha (log)	-0.007 (0.20)	0.012 (0.58)	-2.554 (0.68)
Time* land	0.057 (1.38)	0.044* (1.83)	0.195 (0.55)
Time*ejidatario*landhold.	0.019 (0.29)	0.037 (1.29)	0.289 (0.76)
Procede*landholdings	0.017 (0.31)	0.023 (0.44)	1.637 (1.62)
Ejido*landholdings	0.033 (0.68)	0.002 (0.09)	6.010 (1.12)
Constant			
No of observations	563	563	132
Number of households			66
Log-likelihood	-219.8658	-220.16052	-24.153117

Robust z-statistics in parentheses.

* significant at 10%; ** significant at 5%; *** significant at 1%

During the period under concern, it was not the lack of individual title, but the combination of a financial crisis with insufficient asset endowments which seems to have prevented increased credit access by *ejidatarios* and private farmers alike.⁶⁶ Although this does not preclude the possibility that, as the financial system recovers, the lack of fully transferable ownership rights may become of importance and measures to reduce the transaction costs of making the transition to *dominio pleno* (e.g. by allowing households to make the transition unless the assembly objects within a given time period instead of requiring a decision by the assembly to enable them to do so) might be required, at present this does not appear to be the most binding constraint.

4.3.4 Welfare impact, and costs and benefits of the program

To assess the welfare impact of PROCEDURE, we regress the changes in income received, both on- and off-farm on changes in household characteristics, as well as a number of initial conditions and a dummy for

⁶⁴ This is in line with the finding that, even among those who had undergone Procede, the 1997 survey found very few households (20%) who claimed to be interested in getting *dominio pleno* in order to increase their access to credit.

⁶⁵ This does not exclude the possibility that certified *ejidatarios'* land can be been used as a valuable collateral for accessing informal credit.

⁶⁶ We also note that, over time, ownership of ejido land contributed to a slight increase in the ability to access credit. Although this could suggest that the 1992 reforms increased households' ability to use land as a collateral, a more likely explanation is that the coefficient captures the impact of credit programs that were specifically directed towards the ejido sector.

adoption of the program and its interaction with a number of the variables of interest. Formally, we estimate an equation of the form

$$(3) \Delta Y_i = \gamma' \Delta X_i + \delta' Z_i + \Delta \varepsilon_i$$

where ΔY_i is the change in income between 1992 and 1997 for household i (separated into off-farm and farm income), ΔX_i is a vector of changes in household level variables, including a dummy for whether or not the *ejido* adopted PROCEDE during the period and the interaction of this dummy with some of the variables, and Z_i is a vector of initial conditions at the household level.

Table 15. Impact of Procede on household income growth.

	<i>Farm income</i>	<i>Off-farm income</i>
Procede adoption	661.837*	1,014.411***
	(1.65)	(2.98)
Land per capita (log)	69.209	-130.800
	(0.29)	(0.64)
Procede * per capita land	-379.135	-168.634
	(1.10)	(0.57)
Per capita land squared	-69.317	98.820
	(0.60)	(1.00)
Procede *per capita land square	-315.434**	-133.047
	(2.05)	(1.02)
Procede *hh labor	30.816	582.533***
	(0.22)	(4.83)
Procede *education	12.637	352.807***
	(0.08)	(2.74)
Procede *common land	348.117	84.873
	(1.54)	(0.45)
Procede *irrigated land	-641.785	-1,107.974***
	(1.30)	(2.66)
Procede *rainfed land	23.220	162.507
	(0.07)	(0.57)
Procede *pasture	4.859	157.679
	(0.02)	(0.86)
Procede *migration MX	-54.202	-39.020
	(0.53)	(0.45)
Procede *migration USA	-691.526***	-15.685
	(3.20)	(0.08)
Household labor	-68.978	83.448
	(0.69)	(1.00)
# migrants in US	102.781	403.833***
	(0.71)	(3.26)
# migrants in Mexico	42.125	22.298
	(0.56)	(0.35)
# harvesters	-395.873	479.209*
	(1.31)	(1.80)
# tractors	1,173.688***	260.974**
	(8.22)	(2.12)
# pick-up/trucks	5,482.717***	-749.029
	(7.68)	(1.25)
Pig stock	88.511***	-33.667
	(3.46)	(1.50)
Cow stock	107.739***	25.716**
	(8.70)	(2.48)
# mules and horses	27.665	129.443***
	(0.50)	(2.70)
Per ejidatario commons	-48.822	225.504**
	(0.38)	(2.08)
Constant	-495.644*	667.098***
	(1.80)	(2.85)
No. of observations	1231	1231

Absolute value of t-statistics in parentheses; * significant at 10%; ** significant at 5%; *** significant at 1%

These data allow to test the hypothesis that PROCEDURE provides the basis for engaging in land rental transactions that would allow households, whose comparative advantage is not in farming, to pursue more profitable off-farm opportunities, as well as improved social organization to make use of common property resources. The results from estimating this equation for farm- and non-farm income separately are presented in Table 15.

The most surprising result from the above regression is the significant and quantitatively large positive impact of Procede on off-farm income. This suggests that the program of land rights regularization has indeed helped activate factor markets and allowed those without a comparative advantage in agriculture to rent out their land and join the non-agricultural labor force. The interaction terms suggest that Procede provided disproportional benefits to those with higher levels of education and greater availability of household labor, consistent with the hypothesis that these households were in a better position to participate in land and other markets and take advantage of local non farm jobs. The positive coefficient on the interaction between education and Procede implementation is consistent with the hypothesis that Procede enabled those with higher levels of human capital to take up more remunerative off-farm employment. To the extent that this was not possible before Procede, it would imply that implementation of the program has made acquisition of education and human capital more attractive. Indeed, indications for an impact of Procede on improved functioning of rental markets in regularized *ejidos* have been found in earlier analysis (Olinto 2000), supporting the hypothesis that the recognition of land rights through the program has helped labor-abundant households (with lower management skills) to adjust through rental markets, while at the same time improving the potential for utilization of land by those who remain in agriculture. Overall, adoption of Procede is estimated to have increased annual real off-farm income by 1,014 pesos, mainly as a result of the relocation of labor toward non farm activities with higher returns to human capital that was facilitated by higher levels of tenure security and the ability to rent out land. Both of these were directly intended by the legal changes adopted in 1992 and the systematic implementation of these changes through Procede.

Compared to the very clear impact of Procede on off-farm income, the evidence with respect to farm income is less positive. In fact, the point estimate is actually negative, suggesting that farm income in households who adopted Procede was lower by about P 200 than in those who did not participate in the program. Part of this may be spurious and due to mis-measurement of income (no information on income from land rental was included in the income measure from the survey) used. Also, since most of the *ejidos* were regularized only one or two years before the survey was conducted, one would expect larger investment effects in the future, especially as conditions improve in the macro-economy and the agricultural sector.

In the aggregate, the benefits from the program were clearly positive. Although no precise cost data are available, we can at least attempt a comparison of the benefits to program costs. According to information obtained from the PA, the cost of certification is about US \$ 50 per beneficiary household. Transforming this into Pesos and comparing to the estimated net benefits from the program implies an internal rate of return of 37%, clearly suggesting that the program has been justified economically. To the extent that costs and benefits could be expected to be of similar order of magnitude in the future, completion of the program would be clearly warranted. There is some concern that in the natural resource rich (but not the peri-urban) *ejidos* that remain to be covered costs may be higher and benefits lower than in those that already underwent the program. Examination of the different cost components reveals that the main item was the cost of measurement and survey (75 percent of the total) which has in the past been the responsibility of INEGI, as compared to much lower allocations of 12.5 percent each for conflict resolution (by the PA) and registration (by the RAN). This implies that, even if there is a decrease in the benefits from certification as one moves towards more marginal areas, it should be possible to design a program that would be cost-effective from a social point of view. Reductions in the cost of measurement, there might even be scope to increase the amount of resources spent on conflict resolution, something that might be necessary in view of the different characteristics of these *ejidos* as mentioned earlier.

4.3.5 Access to and use of natural resources

One of the key characteristics of Mexico's *ejido* sector is the availability of large amounts of relatively marginal common lands (*tierra de uso comun*), which are widely recognized to help low-income households to diversify their income sources and insure against exogenous shocks (Key *et al.*, 1998). In the process of implementing PROCEDURE, *ejido* members could individualize use of these lands (*parcelación economica*) over and above what had already been cultivated prior to the implementation of PROCEDURE (*parcelación individual*). Even though the process was closely supervised, and *de-facto* individualization had been widespread in practice even before the legal changes of 1992 or the formal initiation of the certification process, there were fears that implementation of PROCEDURE would allow land-grabbing by powerful *ejido* members. The literature provides many historical precedents for land titling to be associated with systematic land-grabbing by the powerful (Binswanger *et al.* 1995), and it was feared that PROCEDURE would allow well-connected individuals to have illegal appropriations of common lands that had occurred earlier sanctioned officially (not clear). This, it was feared, would convert *de facto* into *de iure* ownership, thereby permanently reducing access to common property resources by the poor who disproportionately depend on these resources as a safety net.

To examine empirically whether access to common property resources within the *ejido* has been affected by PROCEDURE, we distinguish three forms of using common property resources with very different characteristics and connotations, namely collection of firewood and other materials, use of pasture, and cutting of forest. Using information from the panel survey mentioned earlier, we can estimate the determinants of households' access to common property resources before and after PROCEDURE as follows:

$$(4) \quad A_{it} = \alpha + \beta t + \gamma P_{it} + \delta_0 Hh_{it} + \delta_1 L_{it} + \delta_2 P_i L_{it} + v_i + \varepsilon_{it}$$

where A_{it} is a dummy variable equal to one if household i accessed common property resources at time t (before and after PROCEDURE), Hh_{it} represents household size, as well as other characteristics such as the endowments with assets and initial access to common property resources, and L denotes land wealth. As in the earlier equations, we use a fixed effect panel estimator and, for each of the equations, $\gamma = 0$ would imply that PROCEDURE had no impact on the access to the common resource by *ejidatarios*.

We consider three categories of use of common lands, namely collection of forest products (mainly for household consumption purposes); use of pastures for grazing animals; and cutting of trees and discuss them in turn. Table 16 reports the results of the estimation of equation (4) using a random and fixed effect logit estimator, respectively. Since, in this specification, only households whose forest use changed over time contribute to the likelihood function, the number of observations is limited to 173, 243, and 167, respectively, out of the total of 1267. Tests of the random error against the fixed effects specification for each equation using a Hausman specification test reject the former in each case. We therefore focus in our interpretation on the latter.

The probability of households using common lands for grazing of animals (column 1) has increased over time, as illustrated by the positive time effect. This is likely to be a consequence of less intensive cultivation in the wake of worsening crop prices following the removal of the guarantee prices and the liberalization under NAFTA. In addition, PROCEDURE is estimated to have had a significant and positive impact on access to pastures, consistent with the notion that in the process of certification, *ejidatarios* are more likely to formulate rules to govern the access to common lands, and to establish an effective institutional framework that can actually enforce such rules (Zepeda, 2000). This is of particular interest in view of the fact that, due to partial individualization, PROCEDURE was in almost all cases associated with a decrease of the total area under common lands (*Procuraduria Agraria*, 2000). It would be of interest to explore to what extent such enhanced equity in access has been associated with greater efficiency in resource use.

Table 16 - Determinants of common land access, 1994 and 1997

	<i>Use of common land for pasture</i>		<i>Use of forest products</i>		<i>Forest logging</i>	
	Fixed effect	Random effect	Fixed effect	Random effect	Fixed effect	Random effect
Time dummy	0.538** (2.44)	0.666*** (4.62)	1.026*** (3.92)	0.598*** (3.47)	-0.730*** (2.80)	-1.425*** (8.64)
Procede dummy	0.965** (2.06)	-0.200 (1.03)	-0.101 (0.18)	-0.758*** (3.56)	0.533 (0.97)	0.044 (0.18)
Household size (persons)	0.051 (0.81)	0.032 (1.43)	0.135* (1.65)	0.061*** (2.61)	0.146* (1.78)	-0.002 (0.06)
Age (years)	0.034 (0.98)	-0.003 (0.57)	-0.029 (0.67)	-0.013*** (2.62)	-0.050 (1.16)	-0.003 (0.66)
Education (years)	-0.095 (0.94)	-0.006 (0.53)	-0.189 (1.24)	-0.043** (2.16)	-0.305** (2.11)	-0.008 (0.41)
Land owned (ha)	-0.012 (0.83)	-0.010 (1.34)	-0.004 (0.33)	-0.021*** (2.86)	0.008 (0.52)	-0.016** (2.48)
Land*Procede	-0.035 (1.04)	-0.017 (1.16)	0.013 (0.25)	-0.006 (0.35)	-0.048 (0.88)	-0.023 (1.10)
No of cattle	0.020 (1.04)	0.033*** (5.37)				
Cattle * Procede	0.085* (1.76)	0.006 (0.58)				
Common land %	-0.005 (1.32)	0.001 (0.84)				
Common land* Procede	-0.002 (0.83)	0.001 (0.50)				
Percent Forest			0.000 (0.05)	0.008*** (3.15)	0.007 (1.00)	0.011*** (4.56)
Percent * Procede.			0.004 (0.38)	0.023*** (3.16)	0.002 (0.23)	0.012** (2.34)
Constant		-2.078*** (2.59)		-0.744 (0.88)		0.842** (2.14)
No of observations	486	1908	346	1718	334	1718
No of households	243	1288	173	1289	167	1289

* significant at 10%; ** significant at 5%; *** significant at 1%.
Absolute value of z-statistics in parentheses.

Both random and fixed effect regressions for gathering of forest products suggest that use of such products has increased between 1994 and 1997, pointing towards a general crisis in the rural sector. The PROCEDE dummy remains insignificant, suggesting that this intervention has neither increased nor decreased households' propensity to rely on common property resources. Even though household characteristics change little over time, we find that larger households have increased their reliance on common property resources, supporting the role of such resources as a buffer against shocks (e.g. return of family members who lost their migrant job). In addition, the random effects regression highlights that education and land ownership decrease the level of utilization of common property resources, as expected.

Finally, as an (admittedly imperfect) proxy for environmental conservation, we introduce the number of households who rely on logging in common forests.⁶⁷ As Table 16 illustrates, the number of people engaging in this activity has decreased markedly between the two periods. At the same time, there is no significant difference between certified and non-certified *ejidos*. The regression suggests, however, that more educated households have decreased reliance on logging, illustrating the importance of alternative employment opportunities. Concerning the design of PROCEDE, this would imply that, while the program has been effective in increasing access to common pastures, it has not had major impact on

⁶⁷ As the question refers to the number of households engaging in logging rather than to the intensity of this activity, this may not map directly into the degree of environmental conservation.

conservation of forest resources, in line with the fact that, at the *ejido* level, it is easier to internalize the externalities arising from overuse of common pastures than those from forests. Also, fears that PROCEDE may restrict or eliminate access to common property resources by the poor appear to be unjustified.

5. Policy conclusions

5.1 Policy matrix

<i>Policy area</i>	<i>Main issues</i>	<i>Specific steps</i>	<i>Responsibility</i>	<i>Time frame</i>
1. Land policy and institutional framework	<ul style="list-style-type: none"> There is no overarching policy framework encompassing social, private, and indigenous lands. 	<ul style="list-style-type: none"> Identify key issues and develop an action plan for dealing with them in light of existing initiatives. 	SRA, SAGARPA, SEMARNAP, etc?	Short
	<ul style="list-style-type: none"> Compared to 1992, challenges have changed considerably. Institutional responsibilities overlap and mandates are unclear; regulatory authority is weak and fragmented. 	<ul style="list-style-type: none"> Re-orient the goals of the SRA to be in line with post-PROCEDE requirements. Focus each of the institutions involved (PA, RAN, Ficonafe, <i>Tribunales</i>) on their core functions. 	SRA, PA, RAN, Ficonafe, TA	Short
	<ul style="list-style-type: none"> There are no performance criteria to assess effectiveness of different institutions in fulfilling their mandates. 	<ul style="list-style-type: none"> Establish key performance indicators and put in place a system of monitoring to track them. 	SRA	Short
	<ul style="list-style-type: none"> Maintenance of registry information is fragmented between RAN and the public registry. 	<ul style="list-style-type: none"> Explore the benefits and costs from different forms of linking the two systems, possibly through a pilot. 	RAN, Registry, Municipios	Short/ Medium
	<ul style="list-style-type: none"> The social sector is unprepared for the passage of the indigenous law. 	<ul style="list-style-type: none"> Assess the extent to which PROCEDE has been effective in indigenous communities and use international and PROCEDE experience to develop policy proposals for indigenous lands. 	SRA	Short
	<ul style="list-style-type: none"> Key information on performance of the rural sector (social or private) is lacking, making policy evaluation difficult. 	<ul style="list-style-type: none"> Use the 2000/01 Census to design a low-cost information system that would provide key indicators on a permanent basis. 	SAGARPA, SRA, SEMARNAP	Short/ Medium
2. Completion of the PROCEDE program	<ul style="list-style-type: none"> Almost 50% of the land in the social sector has not yet been covered by PROCEDE. 	<ul style="list-style-type: none"> Establish a timetable for completion of PROCEDE (e.g. through a sunset clause for free coverage). Launch information and dissemination campaigns to increase agrarian subjects' awareness of their right and allow them taking advantage of the program. 	SRA	Short
	<ul style="list-style-type: none"> The cases to be dealt with present a different set of problems and productive opportunities. 	<ul style="list-style-type: none"> Appraise characteristics of remaining <i>ejidos</i>, better align its nature to these needs 	SRA	Short
	<ul style="list-style-type: none"> The SRA faces budgetary pressure and the need for a broader orientation. 	<ul style="list-style-type: none"> Reduce costs of program implementation, e.g. by encouraging of out-of court conflict resolution. Provide training to ensure that PA has the necessary skills; if necessary adjust staffing structure. 		
3. Sustainability of the advances made under PROCEDE	<ul style="list-style-type: none"> High level of informality and non-registration of transactions in land markets undermine the accuracy of the information generated by PROCEDE and the RAN. 	<ul style="list-style-type: none"> Align the incentive framework for RAN and Public Registry to comply with their functions. Better integrate decentralized registration services into the existing institutional setup. Launch dissemination to make <i>ejidatarios</i> aware of their rights and the benefits from registration. 	SRA, Local Governments	Medium
	<ul style="list-style-type: none"> Local governments have little access and make scant use of the information provided. 	<ul style="list-style-type: none"> Establish an integrated cadastral system. Decentralize RAN and registry activities. Review and improve the regulatory environment for land use planning, especially in urban areas.. Make information readily accessible to local government. 	SRA	Medium
	<ul style="list-style-type: none"> Non-compliance with subdivision restrictions clogs up the agrarian courts. 	<ul style="list-style-type: none"> Analyze reasons for non-compliance with the inheritance law in the social sector. Provide an administrative solution to the mass of inheritance cases in the <i>Tribunales</i> 	SRA	Medium

	<ul style="list-style-type: none"> Differential taxation of private and social is a major disincentive for adoption of <i>dominio pleno</i> & registration. 	<ul style="list-style-type: none"> Re-assess taxation regime to ensure fair treatment of private and social lands. 	SRA, etc?	Medium
4. Productive development of the social sector	<ul style="list-style-type: none"> Existing programs have not led to large investment or reduction of poverty in the rural sector (social and private). 	<ul style="list-style-type: none"> Review access to and effectiveness of current programs. 	SRA, SAGARPA, SEMARNAP	Short
	<ul style="list-style-type: none"> Lack of coordination and clarity of objectives within existing programs within and between institutions. Long-term perspective of many support programs is unclear. 	<ul style="list-style-type: none"> Establish formal mechanisms to improve coordination between the institutions involved (SAGARPA, SRA, SEMARNAP). Demonstrate the viability of coordination mechanisms through a pilot. 	SRA, SAGARPA, SEMARNAP	Short
	<ul style="list-style-type: none"> The potential for sustainable productive use of TUC is not realized due to lack of capacity and incentives. 	<ul style="list-style-type: none"> Strengthen capacity for management of TUC through existing (FIFONAFE) or new institutions. Explore scope of payments for resource conservation services, possibly in exchange for PROCAMPO. 	SRA, SEMARNAP	Medium
	<ul style="list-style-type: none"> There is little private investment through joint ventures in the social sector. 	<ul style="list-style-type: none"> Review and if needed modify the role of specific agencies (e.g. FIFONAFE) in implementation. Dissemination campaigns and training. 	SRA	Short
5. Land market activation	<ul style="list-style-type: none"> Despite a growing potential, land rental and sales markets remain thin, with short term transactions dominant. 	<ul style="list-style-type: none"> Improve the legal and regulatory environment for rental contracts, especially longer-term ones. Improve dissemination of rental options 	SRA, SEDESOL	Medium
	<ul style="list-style-type: none"> The fragmentation of land ownership and the aging of the social sector reduce the efficiency of land use. 	<ul style="list-style-type: none"> Conduct legal, social, and economic evaluation of options to link generational to structural change. Explore scope for a pension program for old <i>ejidatarios</i> to stimulate land markets. 	Fifonafe, SEDESOL	Medium
6. Peri-urban development	<ul style="list-style-type: none"> Urbanization will pose increasing demands for the social sector. 	<ul style="list-style-type: none"> Utilize more fully the opportunities provided by the PISO. 	SRA	Short / Medium
	<ul style="list-style-type: none"> Irregular urban expansion is disadvantageous for all parties (credit); regulatory authority and enforcement are weak. 	<ul style="list-style-type: none"> Establish pilots to develop and evaluate mechanisms of improving peri-urban land markets.. 	SRA, others	Short / Medium
	<ul style="list-style-type: none"> Partly due to lack of information on land prices, many <i>ejidos</i> sell their lands at disadvantageous conditions. 	<ul style="list-style-type: none"> Establish a land valuation function and land price monitoring system to enhance market transparency and information for rural and urban regions. 	SRA	Short
	<ul style="list-style-type: none"> Even where it would be advantageous, politicking often precludes adoption of the <i>dominio pleno</i>. 	<ul style="list-style-type: none"> Simplify the transition to the <i>dominio pleno</i> and use this as the basis for the development of mortgage markets. 	SRA, SAGARPA	Medium

5.2 Summary of key issues and recommendations

Key Issue # 1: Land policy and institutional framework

Improve capacity for policy-formulation and monitoring: While the almost single-minded and somewhat technocratic focus on implementing PROCEDURE that continues to characterize the SRA may have been appropriate in 1994, and has certainly helped to achieve the impressive accomplishments in terms of area covered with PROCEDURE, greater attention to issues of the policy and institutional framework will be needed in the future. Compared to the well elaborated policy and institutional framework for the social sector, less attention has been paid to ensuring tenure security for private farmers, and existing institutions appear ill-prepared to deal with and implement the challenges arising from broader questions, especially those arising with respect to indigenous land tenure. A more integrated approach that would encompass social, private and indigenous lands would be advantageous, not only in view of the fact that these are often closely related, but also in light of the gradual disappearance of the differences between social and private sector. To deal with this issue, it would be desirable to increase capacity for policy formulation, analysis, and monitoring. A significant obstacle which currently prevents consistent planning and evaluation of policy is the lack of good current socio-economic information on the performance of the rural sector including *ejidos*, communities, and private producers. Increasing attention to this issue could help to transform the accomplishments in terms of program implementation into tangible improvements at the household level, thereby ensuring the sustainability of the interventions undertaken within the *ejido* sector and beyond.

Review, reorient, and increase the efficiency of the institutional structure: With the completion of PROCEDURE on a sizeable share of Mexico's *ejidos*, there is a need to review whether existing programs and institutions well positioned to deal with the challenges of completing the program and accomplishing the goal of improved household welfare. Also, partly in response to sharp swings in the availability of resources, institutional responsibilities have shifted even within *Sector Agrario*, and what is actually done by an institution does in many cases not correspond to its original mandate (e.g. in the case of the PA). This implies a need to clarify the mandates of existing institutions, eliminate overlaps that have arisen in implementation, and ensure that the high quality of the legal framework is indeed transformed into actions on the ground. In practical terms, the PA's involvement should be focused on the role assigned to it in the *Ley Agraria*, whereas the SRA should have a greater role in policy formulation, coordination, and monitoring. For all institutions in the agrarian sector, key indicators of effectiveness should be developed and monitored on a regular basis.

Ensure proper functioning of the system of agrarian justice: To ensure that the system of agrarian justice will be able to accomplish its mandate in an efficient and cost-effective way, it will be critical to un-clog the system of agrarian justice (*Tribunales* and PA) from the a multitude of cases that could be settled out of court. To this end, it is vital to design an incentive framework that discourages litigation, for example by the government shouldering all the costs of legal proceedings, and to eliminate legislation that multiplies legal conflicts without obvious economic gain. The PA should continue its important role as an *ombudsman*, building on its broad field presence. Experience indicates that ensuring an expeditious and predictable delivery of justice, including well established mechanisms for out of court settlement, is critical to increase trust in the system and provide the basis for more elaborate business ventures and investments in the rural sector.

Key Issue # 2: Completion of the PROCEDURE

Increase incentives for completion of PROCEDURE: Although only 25 percent or so of the *ejidos* and *comunidades* are not yet regularized, these represent a substantial portion (almost 50 percent) of the land in the social sector that remains to be covered by the program. Also, coverage varies widely across states (being lowest in the poorest regions). As the remaining *ejidos* are characterized by higher incidence of boundary disputes, internal inequality, conflicts, and often lower land values, the methodology to deal

with them will need to be adapted to these specific circumstances. The challenge is exacerbated by a declining availability of resources within the Agrarian Sector. While our study demonstrates that PROCEDURE has been associated with tangible benefits in terms of household welfare, these are likely to be lower in the *ejidos* yet to be covered. Efforts to increase agrarian subjects' awareness of their rights, and put them into a better position to take advantage of the program, should be undertaken. Establishing a sunset clause for the free provision of certification and measurement services should be considered. Also, all of the efforts at collecting information by the Social Sector have thus far concentrated on regularized *ejidos*, implying that there is very little knowledge on the socio-economic characteristics of the target group for the completion of PROCEDURE. Remedying this situation would help not only to gain a better sense of the challenges ahead, but also to formulate a more specific time plan for the completion of the program. Such information could also be helpful in designing an information campaign aimed at increasing awareness of the situation by the remaining *ejidos*.

Emphasize alternative conflict resolution and social capacity building: The analysis of PROCEDURE adoption indicates that external boundary conflicts are one of the main obstacles to an expedient implementation of PROCEDURE. This implies that the ability to expeditiously resolve conflicts, possibly by using alternative means of conflict resolution, will be a critical factor in determining the pace of PROCEDURE implementation. Although a mandate to utilize out-of court settlement has always been included in the mandate of the institutions in the social sector, it was, in the past, not a major area of emphasis, and incentives for such a measure might need to be strengthened. Efforts to increase the capacity of existing institutions, especially the PA, in this respect are likely to be needed. Also, the remaining *ejidos* are larger and have more common lands, implying that mechanisms for collective management of these resources will acquire increased importance. A review of the experience of the various pilot programs aimed to address this issue should provide important inputs into the design of specific mechanisms to address the issue.

Explore options for reducing program costs: Even though the analysis suggests that the benefits generated by PROCEDURE have exceeded the costs in the past, the lower value of the remaining lands implies that steps to reduce costs of program implementation will be needed in the future. To the extent that such cost reductions could be accomplished through increased community involvement in establishment and updating of information, they could, at the same time, help enhance sustainability of the program.

Key Issue # 3: Sustainability of PROCEDURE

Reduce disincentives for maintenance of registry information: Case study and survey evidence indicate that informality in land sales markets remains high and many transactions are not registered in the RAN. As a result, information in the RAN tends to become obsolete, undermining the durability of the results from PROCEDURE, and the usefulness of the registry as a repository of accurate information on land ownership. Informality is also a problem with respect to the recording of transactions in the Internal Books of the *ejidos*. One key concern in this respect is that rights to the land are frequently inherited to more than one child, something that greatly increases not only the number of conflicts to be dealt with by the PA and the *tribunales*, but also the resistance towards registration. While the prohibition of subdivision upon inheritance may have been justified in the pre-1992 period, when rental and sales markets were completely outlawed, there is no reason to believe that, with an appropriate institutional and regulatory framework, it should not be possible to achieve an optimal distribution of operational farm sizes through the rental market if needed. In this case, the restriction would be obsolete. Extending the inheritance provisions of the civil code (which are already in effect in the private sector) to *ejidos* would be an important step, the appropriateness of which should be evaluated with urgency. Modification of the inheritance law, together with establishment of an administrative mechanism to deal with the mass of inheritance cases currently in the agrarian courts, could not only reduce the potential for social conflict, but also remove one of the most potent obstacles to registration of parcels. Case studies indicate that a second factor inhibiting registration of land transactions, as well as transition towards the *dominio pleno*,

is the fear by agrarian subjects to have to pay taxes. Efforts to improve public information on this subject may be of limited usefulness, as long as agrarian subjects have cause to believe that the exemption of the social sector from land taxes, which is increasingly difficult to justify, will at some point be terminated. The best way to deal with these concerns is to strive for elimination of the inequalities in tax treatment in a realistic fashion, e.g. by reviewing costs and levels of actual tax collection in the private sector, as well as in-kind contributions in the *ejido* sector in an attempt to establish a less distorted scheme of property taxation.

Reduce the transaction costs of registration and improve information sharing: Efforts to reduce the transaction costs of registration, and improve the access to cadastral and registry information should be stepped up. These could build on the itinerant programs for representatives of the RAN to periodically visit *ejidos* and collect information on land transactions, but should include incentives for both the RAN and local institutions, especially *ejido* authorities, to keep information up to date, with greater emphasis on decentralized administration and recording of such changes in *ejidos*' internal books. On the users' side, it would be important to increase the availability of cadastral information to local governments and other institutions, through appropriate mechanisms for information sharing between different institutions. This would require improving local governments' capacity for land use planning, especially in urban areas (and possibly on a pilot basis), and could eventually be linked to decentralization of the RAN to be closer to users.

Explore options for coordination/unification between RAN and public registries: Even though the centralized nature of the RAN has allowed to maintain quality standards which are often significantly higher than those in the Public Registries, the scope for decentralization and linking the two institutions should be explored, especially where the differences between private and social sector are narrowing and users such as local governments require *one* consistent source of information. This may be one of the reasons why local governments do not appear to fully utilize the information available for both fiscal and planning purposes, implying that measures to improve availability of information and build capacity at this level could have an important impact. These could be used to explore, on a pilot basis, the options for greater integration between (and possibly even integration) of the two registry systems.

Key Issue # 4: Productive development of the social sector.

Improve coordination across programs and monitoring of impact: Although the advances in terms of land regularization have been impressive and have yielded important benefits in terms of social peace, improved governance, and rule of law in rural areas, the impact of PROCEDE on agricultural production has thus far been muted. While part of this is due to the macro-economic and sectoral environment, the programs established to help farmers through the period of adjustment may generate perverse incentives (e.g. ASERCA), and appear to be oriented towards short term working capital and even consumption, rather than long-term investment, not always well-coordinated. Improving coordination between the different institutions involved (SEMARNAP, SAGARPA, SRA) would be a desirable first step. Even though these programs have been in operation for a long time, evaluations of their impact appear to be *ad hoc* compared to the efforts undertaken in other sectors (e.g. PROGRESA). Lack of an analytically rigorous and well-publicized system for their evaluation eliminates the scope for a more informed discussion of their effectiveness in terms of targeting, as well as providing the basis for adjustments in implementation or design. The benefits of a more systematic impact assessment, for the social as well as the private sector, could be tremendous, and establishing such a system should be a top priority for rural development policy in Mexico.

Reduce the transaction costs for businesses with ejidos: The regressions suggest that, in view of the general weakness of the rural financial system, the high risk, and the lack of profitability of agricultural ventures in the current environment, absence of formal land rights that can be used as collateral is not the most important factor precluding higher investment by *ejidatarios*. At the same time, many *ejidos* lack the skills needed to manage even simple businesses ventures, access capital for investing in new technologies

and develop new productions or integrate vertically into the marketing chain, and the ability to take advantage of government programs. Due to lack of awareness of suitable enterprise forms and a perception of high transaction costs, the potential for joint ventures between *ejidos* and private enterprises remains severely underutilized, especially in natural resources where the potential for such enterprises is high. Little of the emerging international experience in setting up joint ventures between small farmers and marketing or agro-processing firms is being tapped to identify enterprise models suitable for the social sector that can then be disseminated in a more systematic way.

Consider mechanisms for providing seed capital to joint ventures: In this context, it is worth evaluating whether it would be appropriate to develop parts of FIFONAFE (or PRODEFOR) into providers of venture capital cum consultancy services that would, in addition to providing management skills, be able to take an equity stake in joint ventures, thereby providing assurance both to *ejidatarios* and private entrepreneurs, as has proven to be effective in other contexts. There are a number of areas where the potential for such ventures might be promising, and where pilot programs that build on existing (domestic as well as international) experience could be of great usefulness.

Key Issue # 5: Land market activation

Improve the legal and regulatory environment for long-term land rental: While PROCEDA has improved the functioning of land rental markets, the overall level of activity in these markets remains low, both in the social and in the private sector. More importantly, the short time horizon of rental contracts is unlikely to provide the level of tenure security needed to make the long-term investments in land needed to bring about longer-term structural change. Such change is imperative in view of the advanced age of many *ejidatarios* and private farmers. Even though there may be few legal obstacles to longer-term rentals, there is little awareness of the options and the potential advantages of such transactions, suggesting that a simple dissemination campaign, together with a more explicit focus of the sectoral institutions on the issues that might arise in such transactions, could have a significant impact.

Explore options to encourage investment and structural change: At present there are a number of programs intended to provide incentives for increased investment. It would be important to explore to what extent one can build on such programs, and link support to investment more directly to generational change, as has been done successfully in some European countries. Experience in these countries suggests that schemes providing incentives to investment by young farmers (and “retirement” by old ones) based on long-term rental contracts (e.g. for 12 years) could be superior to complex and arduous efforts of state-sponsored consolidation currently discussed in Mexico and provide a mechanism to achieve many of the same results in a more cost-effective way.

Key issue # 6: Peri-urban development

Increase transparency in (peri-urban) land markets: The ability to quickly and efficiently incorporate *ejido* lands into peri-urban development will be a critical determinant for the Government’s ability to provide affordable housing for a large number of the urban poor, and to provide a basis for the evolution of local government structures. At the same time, the urbanization process continues to be characterized by irregular settlement, illegal land sales, lack of transparency, and in some cases corruption. All of these increase the cost of providing infrastructure, threaten the quality of the environment, and pose losses to municipal finances. The requirement for municipalities and states to establish plans for urban expansion and zoning is a first step into the right direction but, in order to be effective, will require a substantial amount of coordination between the private and social sector. One simple, though possibly very effective, step to increase transparency is to establish a land price monitoring system that would enable *ejidatarios* and *comuneros* to access consistent and reliable information about land prices and their evolution over time. While such a system should not be limited to the peri-urban space, the potentially high impact of a price information system in these areas suggests that they be given priority.

Explore the scope for fast-tracking dominio pleno in peri-urban areas: The fact that a large percentage of *ejidos* in peri-urban areas did not yet undergo PROCEDE, and are therefore prevented from adopting the *dominio pleno*, is an important inhibiting factor for peri-urban development. Incentive-compatible mechanisms to resolve this issue in a speedy way could well benefit all of the parties involved, by preventing a prisoner's dilemma situation that will end in expropriation. One option that should be considered is to amend the legal framework to allow streamlined implementation of PROCEDE – or adoption of the *dominio pleno* by individual *ejidatarios*- for *ejidos* that are located in territorial reserves and areas of planned urban expansion. This could possibly be combined with a pilot to build capacity by *ejidatarios* as well as municipal governments, and with the scope for some venture capital investment. *Corett* would provide a credible threat of expropriation in case other mechanisms prove to be ineffective.

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