

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

NO. 22

THE GOVERNMENT OF THE FEDERAL DISTRICT
THE UNITED MEXICAN STATES

社会開発調査部報告書

**THE STUDY
ON
SOLID WASTE MANAGEMENT
FOR
MEXICO CITY
IN
THE UNITED MEXICAN STATES**

**FINAL REPORT
VOLUME III**

ANNEX

JICA LIBRARY



J 1151138131

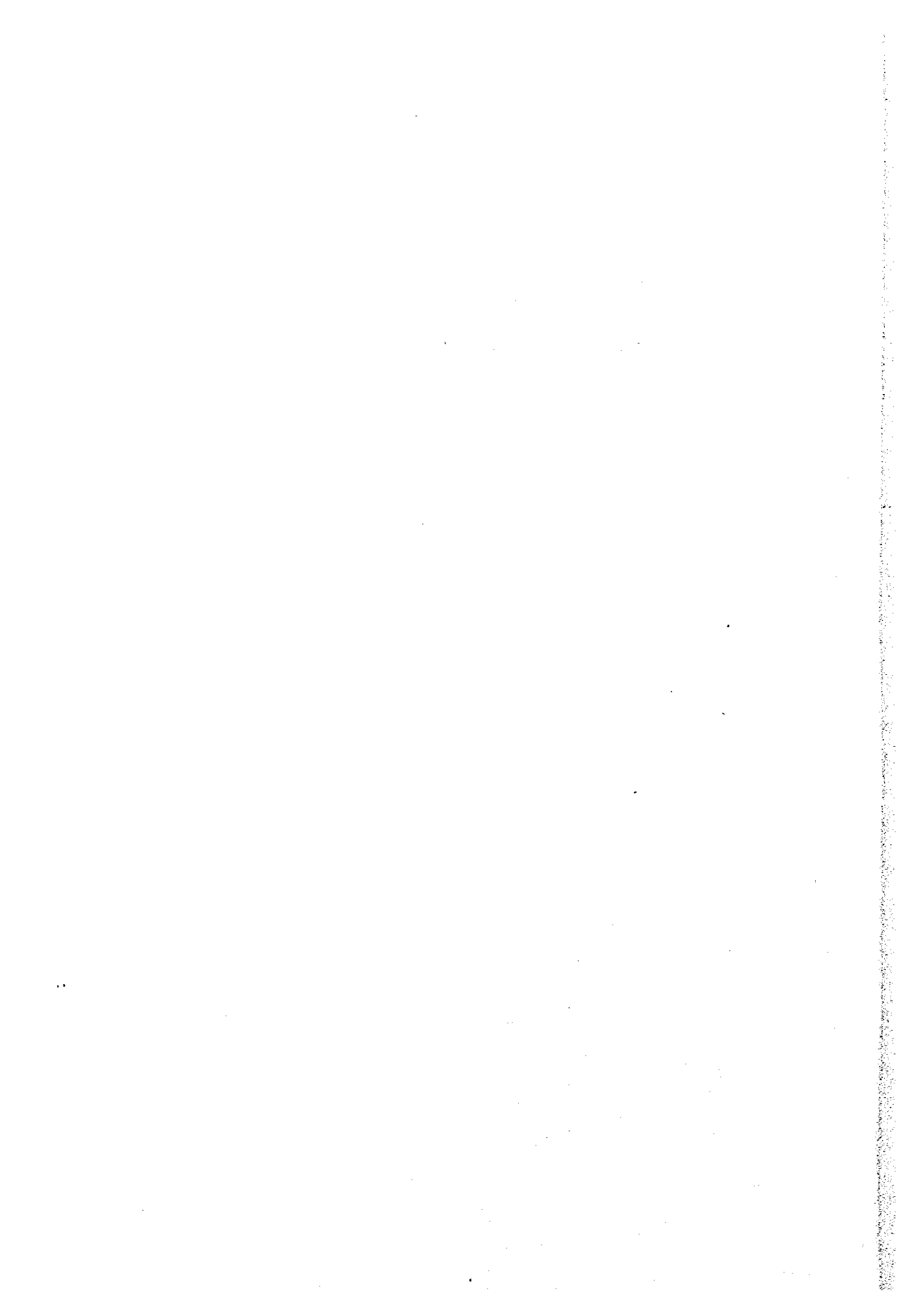
MAY 1999

KOKUSAI KOGYO CO., LTD.

SSS

JR

99-082



JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

THE GOVERNMENT OF THE FEDERAL DISTRICT
THE UNITED MEXICAN STATES

**THE STUDY
ON
SOLID WASTE MANAGEMENT
FOR
MEXICO CITY
IN
THE UNITED MEXICAN STATES**

**FINAL REPORT
VOLUME III**

ANNEX

MAY 1999

KOKUSAI KOGYO CO., LTD.



1151138(3)



The Study on Solid Waste Management for Mexico City in the United Mexican States

List of Volumes

Volume I	Executive Summary
Volume I(S)	Executive Summary (Spanish Version)
Volume II	Main Report
Volume II(S)	Main Report (Spanish Version)
Volume III	Annex
Volume III(S)	Annex (Spanish Version)
Volume IV	Data Book
Volume IV(S)	Data Book (Spanish Version)
Volume V	EIA Report
Volume V(S)	EIA Report (Spanish Version)

This is the Annex.

In this report, the project cost is estimated by using the September 1998 price and an exchange rate of 1 US\$ = 135.00 Japanese Yen = 9.10 Pesos.



Contents

Annex A	Profile of the Study Area
Annex B	Field Investigations
Annex C	Current Situation of Solid Waste Management
Annex D	Comparative Evaluation of Candidate Sites for Final Disposal of Solid Waste
Annex E	Setting up Planning Frameworks for the Master Plan
Annex F	Particulars to be Considered in the Master Plan Formulation
Annex G	The Master Plan
Annex H	Feasibility Study for the Priority Projects

List of Abbreviations

ALDF	DF Legislative Assembly (<i>Asamblea Legislativa del DF</i>)
AMCRESPAC	Mexican Association for Solid and Hazardous Wastes Control (<i>Asociación Mexicana para el control de residuos sólidos y peligrosos</i>)
AURIS	Urban Action and Social Integration Institute (<i>Instituto de Acción Urbana e Integración Social</i>)
BANOBRAS	National Development Bank for Public Works and Services
BOD	Biochemical Oxygen Demand
BP	Bordo Poniente
C/N	Carbon/Nitrogen
CAM	Metropolitan Environmental Commission (<i>Comisión Ambiental Metropolitana</i>)
CNA	National Water Commission (<i>Comisión Nacional del Agua</i>)
COD	Chemical Oxygen Demand
CORETT	Commission for the Regulation of Land Tenure (<i>Comision par la Regulacion de la Tenencia de la Tierra</i>)
CP	Counterpart
CP	Composting Plant
DDF	Department of the DF
DF	Federal District (<i>Distrito Federal</i>)
DF/R	Draft Final Report
DGMA	General Direction of Environment (<i>Dirección General del Medio Ambiente</i>)
DGSU	General Direction of Urban Services (<i>Dirección General de Servicios Urbanos</i>)
DSR	Debt Service Ratio
EF	External Fund
EIA	Environmental Impact Assessment
EIRR	Economic Internal Rate of Return
FDS	Final Disposal Site
F/S	Feasibility Study
FIRR	Financial Internal Rate of Return
FIVIDESU	Housing, Social and Urban Development Trust (<i>Fideicomiso de Vivienda, Desarrollo Social y Urbano</i>)

GATT	General Agreement on Tariffs and Trade
GC	Gathering Center (<i>Centro de Acopio</i>)
GDF	Government of the Federal District (<i>Gobierno del Distrito Federal</i>)
GPS	Global Positioning System
GRP	Gross Regional Product
HDPE	High-Density-Polyethylene
IC/R	Inception Report
IEE	Initial Environmental Examination
IMSS	Mexican Social Security Institute (<i>Instituto Mexicano del Seguro Social</i>)
INARE	National Institute of Recyclers (<i>Instituto Nacional de Recicladores</i>)
INDECO	National Institute for the Development of Rural Community and Popular Housing (<i>Instituto Nacional par el Desarrollo de la Comunidad Rural y de la Vivienda Popular</i>)
INE	National Institute of Ecology (<i>Instituto Nacional de Ecología</i>)
INEGI	National Institute of Statistics, Geography and Informatics (<i>Instituto Nacional de Estadística, Geografía e Informática</i>)
INFONAVIT	National Institute for the Workers Housing Promotion. (<i>Instituto Nacional de Fomento a la Vivienda del Trabajador</i>)
ISSSTE	Institute of Security and Social Service for State Workers (<i>Instituto de Seguridad y Servicios Sociales para los Trabajadores del Estado</i>)
IT/R	Interim Report
JICA	Japan International Cooperation Agency
L/C	Letter of Credit
LGEEPA	Ecological Balance and Environmental Protection Law (<i>Ley General de Equilibrio Ecológico y Protección al Ambiente</i>)
M/M	Minutes of Meeting
M/P	Master Plan
MIA	Environmental Impact Assessment Report (<i>Manifestaciones de Impacto Ambiental</i>)
NAFTA	North American Free-Trade Agreement
NIT	New Intermediate Treatment
NOM	Mexican Official Norm (<i>Norma Oficial Mexicana</i>)
OCR	Ordinary Capital Resource

OF	Own Fund
O&M	Operation and Maintenance (<i>Operación y Mantenimiento</i>)
OECD	Organization for Economic Cooperation and Development
OW	Organization of Workers
P/R	Progress Report
PAHO	Pan-American Health Organization
PEMEX	Petróleos Mexicanos
PET	Polyethylene terephthalate
POS	Public Opinion Survey
PP	Processing Plant
PROFEPA	Office of the Federal Attorney for Environmental Protection
RIMEX	Mexican Industrial Recycles
S/P	Selection Plant
SC	Santa Catarina
SCT	Secretariat of Communication and Transport (<i>Secretaría de Comunicaciones y Transportes</i>)
SDN	Secretariat of National Defense (<i>Secretaría de la Defensa Nacional</i>)
SECOFI	Secretariat of Trade and Industrial Development (<i>Secretaría de Comercio y Fomento Industrial</i>)
SEMARNAP	Secretariat of Environment, Natural Resources and Fishing (<i>Secretaría del Medio Ambiente, Recursos Naturales y Pesca</i>)
SERVIMET	Servicios Metropolitanos, SA
SHCP	Secretary of Finance and Public Credit (<i>Secretaría de Hacienda y Crédito Público</i>)
SJA	San Juan de Aragón
SL	Sanitary Landfill (<i>Relleno Sanitario, RS</i>)
SM	Secretariat of Navy (<i>Secretaría de Marina</i>)
SMA	Secretariat of Environmental of the GDF (<i>Secretaría del Medio Ambiente</i>)
SOS	Secretariat of Works and Services (<i>Secretaría de Obras y Servicios</i>)
SSA	Secretariat of Health and Assistance (<i>Secretaría de Salud</i>)
SWM	Solid Waste Management
T/S	Transfer Station
TDS	Total Dissolved Solids

TGs	Task Groups
UNAM	National Autonomous University of Mexico (<i>Universidad Nacional Autonoma de Mexico</i>)
WACS	Waste Amount and Composition Survey
WB	World Bank
WTP	Willingness to Pay
ZMVM	Mexico Valley Metropolitan Area (<i>Zona Metropolitana del Valle de México</i>)

Glossary

1. Botes: 10-30 liters capacity containers.
2. Cabos: Operation supervisor.
3. Chácharas: Mechanic apparatus, furniture and other articles thrown away as wasteArtifacts, menages and other goods thrown away.
4. Finca: Fees paid by large and medium waste generators.
5. Láminas: Ferrous metal sheets and tin plate.
6. Pepenador: Waste-picker.
7. Propina: Tip paid by minor waste generators.
8. Tambos: 200 liters drum container.

Annex A

Profile of the Study Area

Contents

	Page :
A Profile of the Study Area	A-1
A.1 Natural Condition.....	A-1
A.1.1 Location.....	A-1
A.1.2 Topography.....	A-1
A.1.3 Climate.....	A-1
A.1.4 Geological Condition.....	A-3
A.2 Socioeconomic Conditions.....	A-5
A.2.1 Growth and Macro Management of Economy.....	A-5
A.2.2 Regional Economy, District Federal.....	A-17
A.2.3 Administration.....	A-21
A.2.4 Population.....	A-23
A.2.5 Industrial Structure of Mexico.....	A-27
A.2.6 Education.....	A-28
A.2.7 Community Structure.....	A-30
A.2.8 Squatter Settlements.....	A-30
A.2.9 Public Health.....	A-32
A.3 Urban Structure.....	A-34
A.3.1 General Situation.....	A-34
A.3.2 Land Use Conditions.....	A-34
A.3.3 Population Density.....	A-35
A.3.4 Transportation.....	A-36
A.4 Financial Conditions.....	A-37
A.4.1 Public Finance of DF Government.....	A-37
A.4.2 Taxation System and Public Utilities Charge Collection System.....	A-43
A.5 Environmental Policy.....	A-50
A.5.1 General Review.....	A-50
A.5.2 Organizations Concerned.....	A-51
A.5.3 Legislation.....	A-55

List of Tables

	Page :
Table A-1: Monthly Average Temperature.....	A-2
Table A-2: Monthly Average Precipitation.....	A-3
Table A-3: Key Economic Indicators (1).....	A-10
Table A-4: Key Economic/Social Indicators (2).....	A-12
Table A-5: Economic Indicators.....	A-14
Table A-6: State and DF Profiles, 1997.....	A-19
Table A-7: DF Government Evolution within the National Organizational Framework.....	A-21
Table A-8: Population and Population Growth of the DF, State of Mexico and the Country.....	A-24

Table A-9: Key Population Indicators of the DF (1990 Census).....	A-24
Table A-10: Predetermined Population Growth Rate for Delegations	A-25
Table A-11: Estimated Population of the DF for 1997.....	A-26
Table A-12: Population of Selected Municipalities in the State of Mexico	A-27
Table A-13: Illiterate Population Aged 15 Years and Older in the DF, by Delegation and by Sex Group (Nov. 1995).....	A-29
Table A-14: The Number of Pupils Registered, Teachers, Number of Schools and Classrooms in the DF (1995-96).....	A-29
Table A-15: Infrastructure and Resources of Health Sector in the DF, 1995	A-33
Table A-16: Morbidity and Mortality due to Diarrhea Diseases in the DF - 1991 .	A-33
Table A-17: Surface Area of Nature Protection Areas by Delegation.....	A-35
Table A-18: Population Density in the DF by Delegation.....	A-36
Table A-19: Change in Financial Position of DF Government, 1995-1998.....	A-39
Table A-20: Public Revenues, Expenditures and Budget Allocation for SWM, 1995- 1998	A-39
Table A-21: Consolidated Balance of Public Debt as of March 31, 1998.....	A-42
Table A-22: Consolidated Public Debt Service as of March 31, 1998.....	A-42
Table A-23: Federal and Local Government Expenditure and Taxes.....	A-45
Table A-24: DF Revenue by Source, 1995-1998.....	A-46
Table A-25: Structure of Government by Administrative Order, 1994.....	A-47
Table A-26: Distribution of SEMARNAP's Budget	A-52
Table A-27: The Number of Projects Subject to EIA Regulation in 1997 by Sector	A-60

List of Figures

	Page :
Figure A-1: Monthly Average Temperature	A-2
Figure A-2: Monthly Average Precipitation	A-3
Figure A-3: Geological Map.....	A-4
Figure A-4: Chronological Change in Macro Indicators, 1990 - 1997.....	A-16
Figure A-5: Industrial Structure of DF, 1997.....	A-18
Figure A-6: Order by Size of Aggregate Products.....	A-20
Figure A-7: Industrial Structure in Mexico, 1997.....	A-28
Figure A-8: Identification of Generations of Municipal Solid Waste Who should Pay for Services for Urban Cleansing.....	A-49

A Profile of the Study Area

A.1 Natural Condition

A.1.1 Location

Mexico covers 1,958 thousand km², which is the 14th largest of the world. It shares a border of more than 3,100 km with the United States to the north. The other neighbors are Guatemala and Belize in the south-east with frontiers of 940 km and 250 km, respectively. The country faces Pacific Ocean on the west limited with a 7,400 km coast line, and have a 2,800 km shore on the east exposed to Mexican Gulf and Caribbean Sea.

Mexico City lies between 19°03' and 19°35' at north latitude and between 99°22' and 98°57' at west longitude in the south west corner of Mexico Valley, which is in the center of the country. It has an area of 1,505km² and borders the State of Mexico on the west, north and east and the State of Morelos on the south.

A.1.2 Topography

The topography of the country of Mexico is complex: it possesses coastal plains and highlands over 1,000 meters above sea level with volcanoes which are as high as 5,000m. The Mexico Valley, on which Mexico City is located, has an area of 9,600km² and the altitude of its central plain ranges from 2,240 to 2,390m above sea level.

The western part of the country drains towards the Pacific Ocean and the eastern part towards the Gulf of Mexico and the Caribbean Sea. Since the Mexico Valley is surrounded by volcanic mountains of 5,000m at extreme, however, there is no natural outlets for surface waters from the valley. Thus the Mexico Valley forms an independent watershed of its own.

Looking at the DF and its surrounding, there is a mountainous area over 3,000m altitude, called Sierra de Chichinautzin, on the border of DF and the State of Morelos, which also corresponds with the south edge of the Mexico Valley. Mount Ajusco, which is 3,898 meters high and the highest in this area, stands in the middle of Tlalpan delegation in the DF. For this reason, the DF is generally sloping toward north. Another mountainous area, Sierra de Monte Alto, is found about 10 km away to the west of the DF making a gentle slope toward east in the west part of DF. There are other two mountainous areas of smaller scale: Sierra de Santa Catarina in east of the DF divides delegations of Iztapalapa and Tlahuac and Sierra de Guadalupe is on the north border with the State of Mexico.

A.1.3 Climate

The climate of Mexico varies over the country due to its diverse topography: it has areas permanently covered with snow and areas of rain forests with abundant wild lives.

Although the latitude is relatively low, the outstanding topography of Mexico City makes its climate temperate and dry. The annual average temperature typically ranges from 10 to 25°C with an average of 15°C. The hottest month is May, the minimum temperature being 12°C and the maximum temperature being 26°C, while the coldest month is January with the minimum of 6°C and the maximum of 19°C.

Table A-1 and Figure A-1 show the monthly temperature averaged for about half century at three meteorological stations. Tacubaya is in the urbanized area, Ajusco is in a mountain and Gran Canal is in the outskirts of the northeast of Mexico City.

Table A-1: Monthly Average Temperature

Name of the Station	Period	Months (Degree Centigrade)											
		Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Tacubaya	1921-1996	12.9	14.3	16.5	17.7	17.9	17.3	16.1	16.1	15.8	15.1	13.9	13.0
Ajusco	1962-1997	9.1	10.1	11.9	13.1	13.5	12.8	11.7	12.0	11.6	11.2	10.2	9.6
Gran Canal	1950-1990	13.4	14.7	17.1	18.7	19.3	19.0	18.0	18.2	17.9	16.8	15.1	13.7

Source: CNA

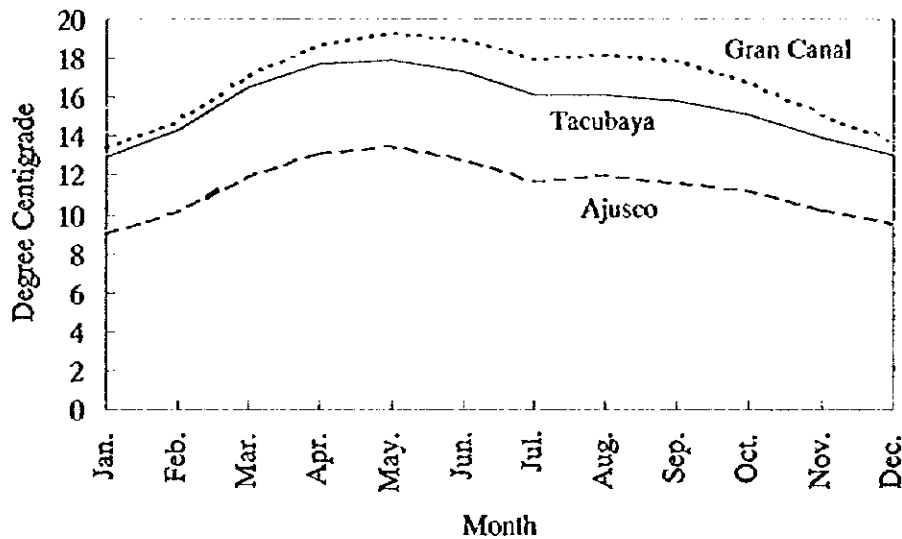


Figure A-1: Monthly Average Temperature

That hard rain is seen only in a limited season illustrates a tropical feature of Mexico City. Its average annual rainfall is recorded at about 600mm, with a general trend that northwest part of the DF has less rainfall than southeast mountainous area. Most of rainfall is concentrated in a period from June to September. February is the driest only having 5 to 8 mm of monthly precipitation at average in the plateau. (Table A-2, Figure A-2)

Table A-2: Monthly Average Precipitation

Name of the Station	Annual Precipitation	Months											
		Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Tacubaya	785.9	8.3	5.7	10.2	24.6	57.1	135.7	172.9	157.6	136.1	57.0	14.0	6.7
Ajusco	1,173.6	17.8	12.7	13.2	37.8	95.3	212.2	234.3	237.1	211.9	78.7	13.0	9.6
Gran Canal	580.9	7.4	7.8	10.6	22.3	50.4	99.9	122.2	111.6	92.4	43.2	8.2	4.9

Source: CNA. Monthly Rainfall Record.

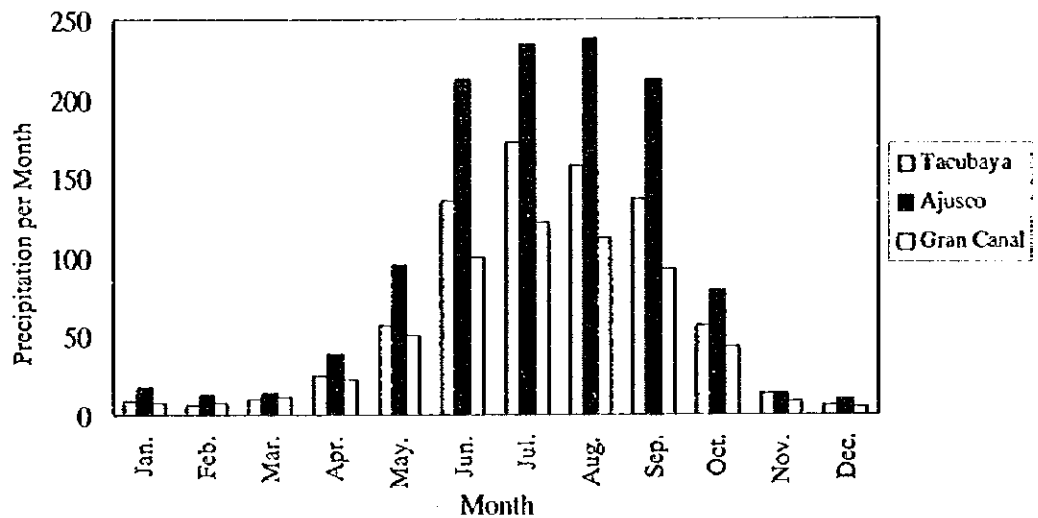
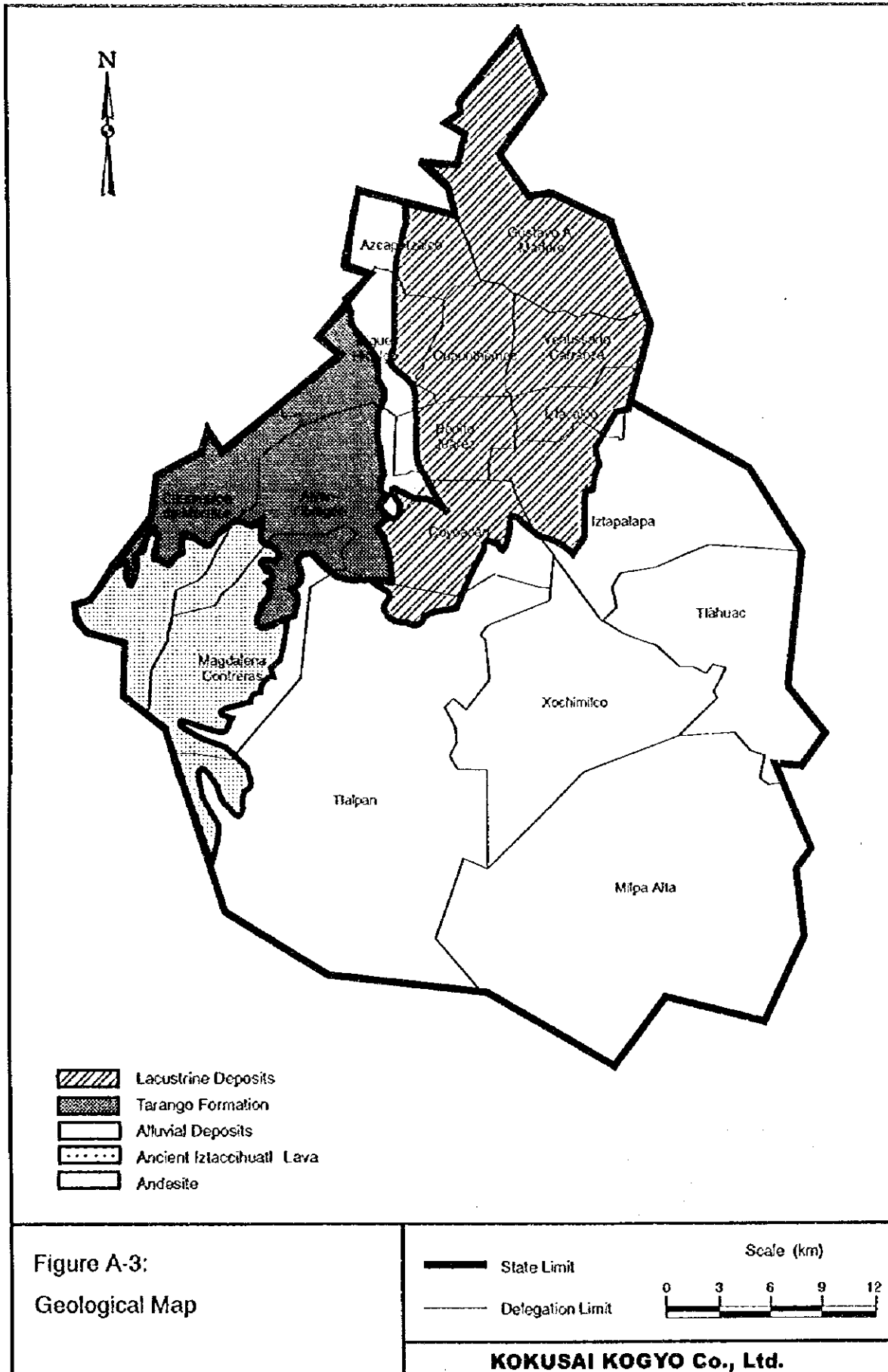


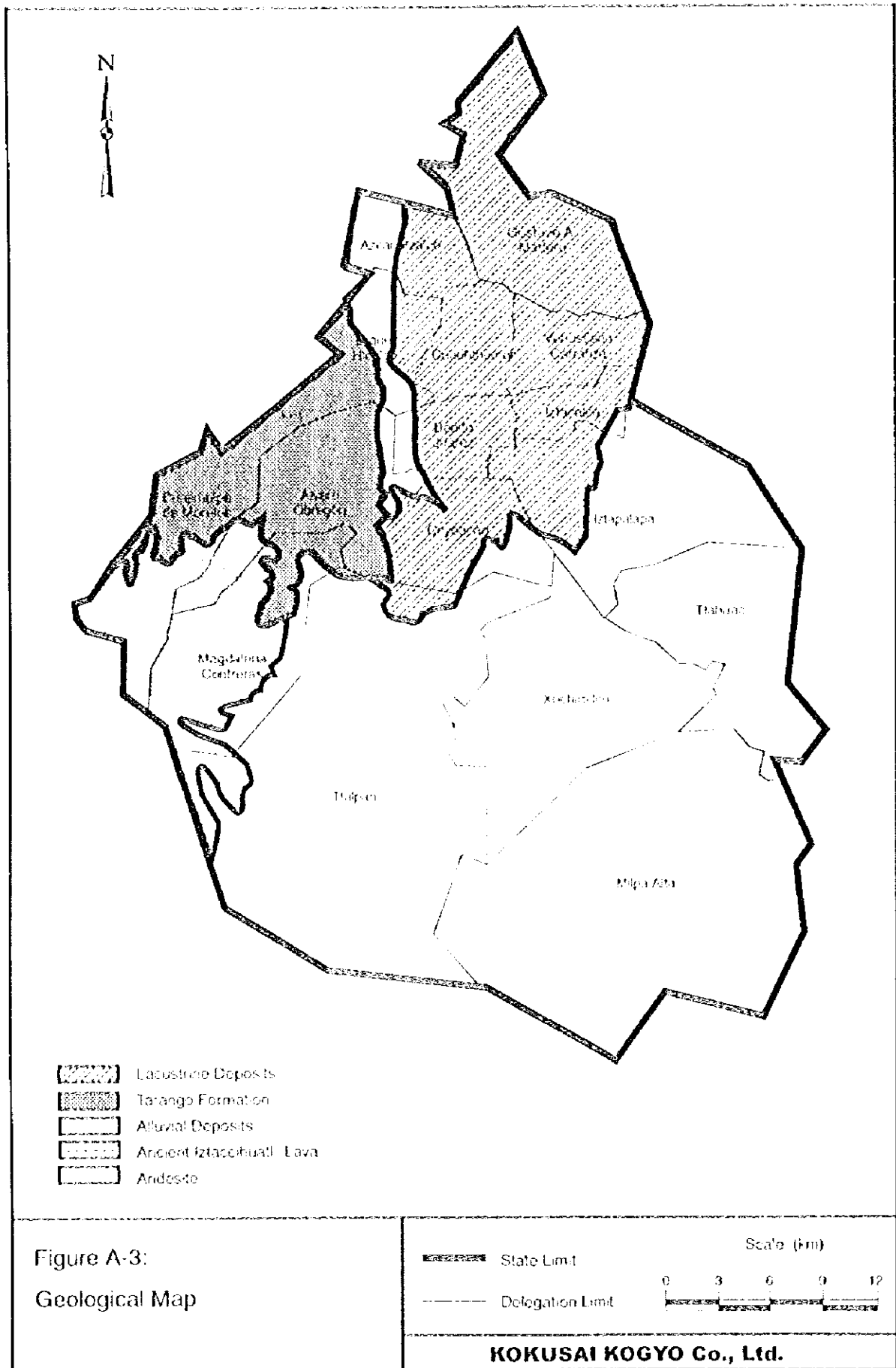
Figure A-2: Monthly Average Precipitation

A.1.4 Geological Condition

Geologically the DF can be classified into five. The northeast part of the DF, in which the most urbanized area of the present city is included, is Lacustrine Deposits since this part was within a single water body at the end of the ice age. This water body was then divided into five lakes, namely Zumpango, Xaltocan, Texcoco, Chalco and Xochimilco. The natural evaporation, withdrawal of lake shore and artificial reclamation have formed what they are now. The center of Mexico City was in the Texcoco lake until about the 18th century. Xochimilco drainage area in the south east of Mexico City is the remnant and the other four lakes are in the State of Mexico.

In the northwest lies the Tarango Formation. The Alluvial Deposits forms a corridor between the Lacustrine Deposits and the Tarango Formation. The south west of the DF part is formed by lava of ancient Iztaccihuatl. The rest is Andesite which is made with lava of Chichinautzin mountains and extends the most south part of the DF.





A.2 Socioeconomic Conditions

A.2.1 Growth and Macro Management of Economy

A.2.1.1 Proposition

a. Growth and Macro Management of Economy

Mexico is now back on the track for steady progress and economic recovery through the unexpectedly rapid and robust accomplishment of four-years of stabilization and reform initiated in FY1995. Over the past four years, reform of the financial sector, monetary, investment, exchange rate and trade regimes, and of the tax system have initiated a quiet economic revolution. With these reforms, Mexico has again joined the growing group of countries that have gradually but persistently taken measures to increase their integration with the globalized economy. Initiated with the outline look at the economic front of global and the Latin American region recently in place, this section overviews the country's long and winding path where the macro management of economy as initiated by the government and the people of Mexico, and growth took place in the past decades. For an easy and quick look at the economy, a chronological changes in major macroeconomic indicators are illustrated in Table A-5 as attached.

a.1 A Bird's Eye View of Global and Regional Outlook – 1997 and Onwards

The Asian crisis and a recession in Japan will lead to the weakest global performance for the years to come, while a global slump is not in prospect. With the current estimate of 2.9 percent in 1998, which is evidently sluggish by recent standards of 3.5 percent of the long-run average growth rate, world growth will recover somewhat in 1999 and would revert to the pre-crisis rates in 2000¹. In the North and Latin America region, the United State and Canadian economy continues to expand very rapidly. The short-term fiscal outlook in the US is the best in the G7. Owing to strong revenue growth in line with the economic expansion currently in place and the fiscal tightening in the past six years, a small federal-budget surplus seems likely this year, the first time the public finances have been in balance since 1969. Nonetheless, the US economy will slow late in 1998 as the collapse in Asian demand would start to have a negative impact on US trade sector, notably, weaker exports to the region and increased penetration by import suppliers. By 1999 this outcome will be broadening out into the non-tradable sectors as slower employment growth and softer equity prices hit private consumption, while the more difficult domestic and external environment slows investment growth. The policy response in Latin American countries to the onset of the Asian crisis was encouraging with the generally better-regulated and more robust banking sectors in the region. While Latin America seemingly continue to have economic drawbacks, among others, a preponderance of pegged exchange rates and large current-account deficits, the long-term growth prospects are remained optimistic. After a slow-down in 1998, the economic growth is anticipated to accelerate towards 5 percent by the end of 2002.

¹ This forecast is produced with the aid of the Global Econometric Model (GEM) developed and maintained by London Business School and the London-based National Institute of Economic and Social Research. (Ref. EIU, *Global Outlook*, 2nd Quarter 1998)

a.2 Mexico – Advent of Economic Crisis, 1995

Mexico, with Gross National Products per capita (GNP p.c.) of about \$4,420 (1997) placing it currently amongst the lower middle-income², and severely indebted countries³, is at a cross roads requiring efficient management and long-term planning of economy from the government. On the economic front during the most period of the 1950s and 60s, the performance was well in shape in the wake of some substantial economic turbulence that ended in large devaluation and fiscal adjustment in the early 1950s. With growth, financial stability, and relatively robust external accounts that took place during the two-decades, the period has come to be known as the time of "stabilization development", while retaining real GDP growth rates of roughly 6 percent per annum. Economic policy during this period was mostly inward-looking import-substituting industrialization with the state actively involved in regulation, production and distribution. While the global economy was seriously affected by the twice of oil crisis in the 1970's, Mexico, an oil-exporter, under the administration of President Luis Echeverria attempted to foster growth through expansion of public sector expenditures, rising subsidies, protection of high cost domestic production, and reducing unemployment by placing workers on government payrolls. Public sector expenditures as a percentage of GDP increased by more than half between 1971 and 1976, arising from 20.9 percent to 31.9 percent. External deficits associated with government borrowing and an increasingly overvalued exchange rate led to a large increase of the country's foreign debts of \$ 28 billion from \$6.3 billion during the same period.

Following the first financial and economic crisis in 1977 and a quick recovery by increased oil revenue in the subsequent year, Mexico experienced in 1982 another economic crisis. Rapidly rising public expenditures unmatched by revenue growth led to the unprecedented level of 40.1 percent of GDP, while fiscal deficit reached nearly 18 percent of GDP. In February 1982, the Bank of Mexico stopped supporting the peso, thereby leading to a 40 percent devaluation in US dollar term. As capital flight intensified, coupled with the nationalization of the Banks in September 1982 and the mandatory conversion of US dollar deposits into pesos, the world banking community and private sector lost confidence in committing new funds to Mexico in the amounts required. As such, Mexico had to experience another devaluation of 35 percent in a year and the suspension of amortization payments on most of the country's external public debts. Also introduced pertain to exchange controls and quantitative restrictions covering all imports.

Meanwhile, there was considerable periodical variation in performance on the economic front, reflecting the uncertain course of macroeconomics policies and the economy's vulnerability to external shocks. Faced with the aftermath of the debt crisis as noted above, late 1982 began with a stabilization program under the Extended Fund Facility from the International Monetary Fund (IMF). Combined with structural

²Lower middle-income economies are classified as those with a GNP per capita of more than \$766 but less than \$3,035 in 1995, while upper middle-income economies ranging \$3,036-\$9,385. Classification by income does not necessarily reflect development status. Besides Turkey, Mexico is amongst the few developing economies that are members of the Organization of Economic Cooperation and Development (OECD).

³Severely indebted means either of the two key ratios, vis-à-vis, present value of debt service to GNP and present value of debt service to exports is above critical level, while exceeding 80 percent and 220 percent respectively. (Ref: World Bank, *Trends in Developing Economies 1996*, p.579)

change that took place in several segments of the economy, inception of this program turned out to be drastic contraction of domestic demand, through fiscal, exchange rate, and the monetary policy, and the introduction of market mechanism in resource allocation. The import substitution policy was replaced by an export orientation, and the preceding regulatory framework was substituted for a more market-oriented economic environment. While the stabilization effort for the succeeding years was impressive, with public sector expenditure downsized to 33 percent of GDP, net foreign reserves increased from a negative \$2.0 billion to \$6.5 billion by the end of 1984, and total net foreign borrowing declined about 4 percent in real terms, stabilization in the absence of more fundamental restructuring could not restore Mexico's creditworthiness nor put the country on the track of sustainable growth. Despite tight fiscal and monetary policies, inflation rose to the level much higher than had been projected, the fiscal deficit leveled off, and GDP recovered only partially in the middle of 1980's.

Mr. Salinas de Gortari who took office in 1988 promised a new era of pluralism and transparency in political life, while on the economic front being determined to modernize the economy by opening it up to market forces. With this, the early 1990's began with the government's new policies of outward-oriented, private sector-led, and international integration development strategy that set the basis for resumed growth. The key elements in the success of the strategy were, among others, fiscal austerity, the opening of the economy and a changing role for the government. There was deregulation in the finance, transport and communications, and agriculture, forestry and fishery sectors. Inflation dropped sharply to less than 10 percent in 1993, down from an average of 90 percent per annum during 1982-1988. Through expenditure cuts, combined with revenue increase, the overall public sector financial balance went from a deficit of 16.9 percent of GDP in 1982 to a surplus of about 0.5 percent in 1992. The government's direct role in the economy was reduced through the implementation of sweeping privatization program that generated funds in excess of US\$ 21 billion. The government cut the number of nationalized banks from 60 to 19, of which the government privatized 18 banks in 1991-92⁴. Subsequently in 1993, new domestic banks were allowed to establish in a bid to improve the availability of credit and drive intermediation margins down through competition. Banks operating in the US and Canada were granted licenses to its subsidiaries in the following year.

In the meantime, the trade liberalization initiated by Mr. Miguel de la Madrid, Mr. Salinas's predecessor, was consolidated and enhanced by the forging of free-trade pacts, inclusive of the North American Free-Trade Agreement (NAFTA) with the US and Canada that came into force in 1994. While Mexico joined the General Agreement on Tariffs and Trade (GATT) in 1986, the country signed the Montevideo Treaty for setting up the Latin America Free Trade Association, and subsequently, pursued greater regional integration by entering into free trade agreements with Chile (1991), Costa Rica, Bolivia, Venezuela, and Colombia all in 1994.

⁴ From the outset, the newly privatized banks had severe burden of non-performing loans. By September 1995 the ratio of bad debts to the banking system's total loan portfolio had risen from 8.3 percent to 17.2 percent and consequently to a peak of 19.2 percent at the end of 1994 and in February 1996, respectively.

A.2.1.2 1994 External Debt Crisis and Recent Performance

a. 1994 Debt Crisis

Yet, the reforms of the mid- to late 1980s and the early 1990s did not deliver the expected rapid growth, poverty reduction and improvements in social welfare. Lasting macroeconomic stability was not achieved as reflected in the 1994 crisis. This was largely due to a failure in structural reforms, though significant they were, to bring about the necessary increase in domestic savings and associated capital accumulation, and productivity, the fundamentals of growth. The rate of national saving downsized substantially to 16 percent of GNP in 1993 from an average of 24 percent during 1981-85. With the deterioration of internal saving as given, relatively high performance in economic growth during this period took place at the cost of an increase in net inflows of foreign debts⁵, thus ended in the peso crisis of 1994-95.⁶

Slow productivity growth, lower domestic savings, and an appreciated exchange rate altogether implied a large expansion of the current deficit, with 7 percent of GDP in 1992-1994 arising from 3 percent of GDP in 1989-1990. This order of magnitude of current account deficits had been offset prior to 1994 by extremely high levels of private capital inflows to finance. In 1993, net foreign capital inflows of \$29 billion over-financed the current account deficit of \$23 billion, while leaving \$6 billion of reserve gains. In the meantime, growing investors concern about the increasing vulnerability of the Mexican economy, coupled with political instability, notably, the uprising in Chiapas and political assassinations, and the rise of interest rates in the US shuttered net capital inflows drastically down to \$10 billion in 1994.

Difficulty was further encountered by the government which reckoned that the slowing of capital inflows and rising pressure were a temporary phenomenon. During the period of mounting pressure on the peso and the losing reserves in December 1994 and the initial two months in 1995, the interest rate policy adjustment undertaken by the government came too late and too little, thereby leading inevitably to a loss of valuable time when the government could have increased the flexibility of the exchange rate band with reserves at a reasonable level. Capital outflows intensified with the reserves downsized to around \$6 billion in the end of 1994, less than a month's import, from \$25 billion at the start of the year. Financial markets continued to exhibit great volatility in January and February, with the peso continuing to depreciate. What made worse was that the monetary authority shifted the composition of domestic public debt from peso-denominated securities (*cepes*) to dollar-indexed securities (*tesobonos*), transferring the exchange rate risk from investors to the government. Further, issuance of *tesobonos* created short-term, dollar-linked liabilities of nearly \$30 billion, thus accelerating the vulnerability of the economy.⁷

At the root of Mexico's financial difficulties was that macro-management of economy, though improved, had been inconsistent in maintaining fiscal and monetary

⁵ Net inflow of foreign debts surmounted in excess of 6 percent of GNP per annum during 1992-94.

⁶ With this in view, World Bank undertook the study, namely, *Mexico: Stabilizing Savings for Growth*, in 1997 to examine the behavior of the Mexico saving rate in the year after 1987 and to evaluate several hypotheses that have been put forth to account for its decline.

⁷ Reference: World Bank, *Trend in Developing Economies, 1996, Financial Sector Restructuring Program, 1995*

discipline, external competitiveness, and prudent debt management. Financial stability and efficient resource allocation were undermined also by weak banking system, vis-à-vis, a deficient incentive regulatory and supervisory framework for banks. Public institutional weakness undermining quality of governance blunted the edge of expenditure programs aimed at poverty reduction. Consequently, high interest rates, tight monetary policy and a climate of uncertainty choked private investment. Swinging fiscal cuts caused sharp falls in public investment and spending, as such the urban unemployment rate surged to 7.6 percent. Fuelled by peso devaluation, another chronic macro-disequilibrium, notably, inflation, eroded wages, thus leading to a collapse of private consumption. Real GDP in 1995 sharply downsized to -6.2 percent from the annual average rate of 3.9 percent during the period of 1990-94. Domestic fixed investment plunged 30 percent and formal sector unemployment rate doubled. The only positive development took place in the external sector with a surge of exports accompanied by a fall in imports.

b. Economic Program in March 1995

Faced with this difficulty in economic management, the Zedillo Ponce de Leon administration responded with a strong adjustment program on 9 March 1995 to alleviate the situation under the assistance of the international finance package. Those include, among others, (i) a substantial tightening of monetary and fiscal policies, (ii) a large exchange rate adjustment through moving to a floating exchange rate regime, (iii) steps to deal with the severe distress in the banking system, (iv) initiation of further structural reforms in social security, and deregulation and privatization, and (v) measures to strengthen the social safety net to alleviate the inverse impact on the poor. Consequently, Mexico made substantial progress in a relatively short period of time in restoring financial stability and paving roads for a resumption of growth. Robust exports already in place since 1994, associated with improved competitiveness resulting from exchange rate adjustment, have drastically cut the current account deficit, while correcting a fundamental disequilibrium underlying the 1994 financial crisis. With this, the country's economy rebounded in 1996 with real GDP rising by 5.1 percent, reversing the decline of 6.2 percent in 1995. Inflation went on a downward course, with consumer prices settling at respective of 35.2 percent and 20.4 percent in 1996 and 1997 as compared with 51 percent in 1995. The backslide of inflation allowed the peso to stabilize and interest rate to decline, with the annual rate on the bench-mark 28-day *cetes*⁸ falling from a peak of 48.24 percent during the crisis to 32.91 percent in 1996 and subsequently to 21.3 percent in November 1997⁹. Improved investor confidence was reflected in progress in the country's access to international capital markets, such that part of Mexico's external obligations being refinanced on more favorable terms, and, together with the international assistance package, rebuild foreign reserves.

A.2.1.3 Performance in 1997, Short-term Outlook, and Medium Term Policy Framework (PRONAFIDE)

In the course of 1997, considerable advance was attained in series of aspects regarding the domestic environment. Economic performance as borne out by the major macroeconomic indicators is elucidated as follows. In 1997, the GDP at current

⁸ Average interest rate on 28-day peso Federal Treasury Certificates

⁹ Source: OECD, *Economic Survey 1998, Mexico*, February 1998

price amounted to \$418.1 billion equivalent (P3,182.3 billion as per 1997 foreign exchange quotation) strongly arising from \$330.0 billion, and the GDP per capita in nominal term increased in dollar term to \$4,419.9 equivalent from \$3,468 equivalent¹⁰. GDP growth rate in real term was 7.0 percent arising from 5.1 percent in the previous year. Inflation amounted to 15.7 percent, while the fiscal and current account deficits remained at comfortable levels of -0.5 percent and -1.7 percent, respectively. With the newly created 882,000 permanent jobs in 1997¹¹ and a further 122,000 during January and February 1998, the open unemployment rate fell to 3.3 percent in November and 2.8 percent in December 1997. While the figures are the lowest ever since the first quarter of 1994, the portion of the labor force employed at below the legal minimum wage remained at about 14.5 percent.

Deputy Finance Secretary was quoted on 31 July 1998 as saying that the country's GDP growth posted 6.6 percent in real terms in the first half of the year, while exceeding the government and most analysts' projection of 4.5 to 5 percent. In his address, he also indicated that the dip of oil price that inversely affected government spending has not had an impact enough on other economic sectors because of currently meager share of oil standing at 6 percent of the country's exports. In the meantime, the government downsized its growth outlook for 1998 to 5.0 percent from 5.2 percent, following the announcement of the first of three budget cuts.¹²

Table A-3: Key Economic Indicators (1)

GDP (1997, estimate)	US\$ 418.1 billion
GDP per capita (1997, estimate)	US\$ 4,419.9
Annual Real Growth Rate of GDP (1997, estimate)	7.0 %
Consumer Prices % Change (1997) ¹³	15.7 %
Exchange Rate (1997 average, Ps/\$)	7.91

Sources: EIU, *Country Report*, 1st Quarter, 1998

• Short-Term Outlook

Resilience in the face of the spillover effect of the Asian financial crisis has demonstrated the increasing strength of Mexican economy and soundness of macro-management of economic policies adopted by the Government. The impact of the crisis was two-folded on the Mexican economy, inter alia, (i) through the trade balance, and (ii) through the impact on the capital inflows into the country. Firstly, the crisis has brought a substantial appreciation of the peso against those of the Asian currencies, thereby leading to an undermining of export competitiveness of Mexican products in the US market. Moreover, lowering growth in the industrialized economies due to the crisis inevitably reduced demand for the Mexican products abroad. Secondly, a worldwide asset deflation substantially squashed capital exports

¹⁰ For comparison, the weighted averages of GDP per capita at current price in 1997 for the world and Latin America amounted to \$5,866, and \$4,604, respectively. (Source: EIU, *Global Outlook*, 1998)

¹¹ Source: EIU, *Country Report, Mexico, 2nd Quarter*. The figure supposedly includes the job creation both in the formal and informal sectors. Meanwhile, in the 1st Quarter edition, EIU indicates that 674,000 jobs have been created in the formal sector in the same year.

¹² Source: *The News*, August 1, 1998. Official figures on economic growth will be released on 19 August 1998.

¹³ For reference, another economic report figured out the inflation rate at 15.7 percent in 1997. (IIF, *Mexico Economic Report*, Feb 1998)

from industrialized economies, as such the international financial markets be more volatile and the Mexico's access to foreign resources not be easy as was before. Nonetheless, the financial shock from international markets was briskly absorbed by providing macroeconomic stability in the economy, through a combination of relatively higher domestic interest rates, a modest nominal depreciation of the exchange rate, and a \$0.6 billion loss of international reserves¹⁴. The confidence is also rooted in the facts as previously noted, vis-à-vis, the highest economic growth observed in more than fifteen years, a substantial decrease in inflation, private expenditure reactivation, creation of job opportunities of above 1 million, and a noticeable contraction of real and nominal interest rates.

The recovery of the Mexican economy has gained momentum with monetary policy committed to further disinflation and prudent fiscal policy firmly underway. While the external constraint remains a concern for the medium-term outlook, foreign direct investment and other long-term capital inflow would finance the current account deficits as long as it remained moderate. Additionally, higher domestic saving is needed to avoid too heavy reliance on foreign borrowings and direct investment. With this in view, sustaining income growth with low inflation, coupled with further enhancement of the effectiveness of taxation and public spending are on the top line of the policy agenda for the government.

Numerically, real GDP growth rate in 1998 would slow to substantial level of around 4.3 percent, while a robust export performance would lift the aggregate supply back to around 5 percent in 1998 and 1999, respectively. In a mid-term outlook for the Mexican economy as a whole, the annual growth rate of real GDP per annum over the period of 1998 through 2002 is forecasted to outnumber the entire world and Latin America with 4.4 percent as against 3.7 percent for the latter. Utility tariff increase and an associated high inflation in the early 1998 drew some attention and worries that year-end inflation rate would be far beyond the target of 12 percent, while reaching at around 13.4 percent in 1998, and subsequently falling around 4 percent down to 9.1 percent in 1999. Should the peso weaken abruptly in the years ahead, the outlook for inflation would be bleaker, accordingly. While exports will continue to rise in the years to come, stronger domestic demand would also increase the pace of import growth. With this in view, the deterioration of the trade balance would widen the current-account deficit to 2.7 percent of GDP and 3 percent in 1998 and 1999, respectively¹⁵. Mexico's total external debt stock will grow in line with the increase of indebtedness of the private sector. External debt to refinance a large proportion of repayments falling due 1998-2000 will reach \$186.3 billion and \$192.7 billion, or alternatively 160.4 percent and 149.9 percent of export values in 1998 and 1999, respectively. As regards the evolution of exchange rate under the influence of capital flows, and goods/service flows in part, year-end currency quotations of the peso

¹⁴ In September and October 1997, the nominal exchange rate depreciated more than 2.0 percent during the first half of the previous business day, thereby leading to an automatic implementation of a built-in stabilizer of the Mexican floating exchange rate regime. Bank of Mexico intervened in the foreign exchange market to moderate the pressure on the peso.

¹⁵ Mexico's trade deficit swelled 22 percent to \$530 million in June 1998, expanding for the 12th month in a row, largely due to the dynamic drop in oil price, an increase in agricultural imports, and the 45-day General Motors strike and plant closing in the US. With this, imports totaled \$10.8 billion, a jump of 7.4 percent from May 1998. In the meantime, the country's exports increased by 9.8 percent over June 1998, growing 10.5 percent for the first half of this year, totaling to the figure of \$10.3 billion. (Ref: *The News*, July 23, 1998)

against the US\$ are anticipated to go downward to respective of 8.98 and 9.54 per unit of greenback, or 10.2 percent and 15.3 percent of deterioration from 1997 level, in 1998 and 1999.¹⁶

A.2.1.4 National Development Program and Recent Peso Plunge 1998

a. National Program for Financing Development 1997-2000 (PRONAFIDE)

Meanwhile, the government announced a macroeconomic scenario in November 1997, namely, the National Program for Financing Development 1997-2000 (PRONAFIDE), thus setting forth the policy framework for the remaining period of the administration currently in place. While elaborating on the government's broad strategy as reflected in the "National Development Plan 1995-2000", the program articulated an explicit statement of principles, coupled with a quantitative baseline scenario, for policy makers to adopt over the 3-4 year period ahead in a bid to maintain a stable macroeconomic environment in the country. While stressing the importance of domestic saving to finance investment, the program aimed to reduce the economy's vulnerability to changes in foreign investors' sentiments. The baseline scenario envisages a gradual return of GDP growth rate of 5.6 percent at the end of the period, led by exports and investment, while consumption picks up at a leisurely pace. Inflation is targeted to keep on a declining path, while falling to 7.5 percent by 2000 from 15.7 percent in 1997. In line with the increase in foreign savings to 3.2 percent of GDP, gross domestic saving is envisaged to reach 22.2 percent of GDP in 2000, both arising from 1.6 percent and 20.6 percent of GDP in 1997, respectively. Current account deficit in 2000 is presumably benchmarked at US\$15.3 billion arising from \$6.0 billion in 1997, whereas the public sector deficit downsizes to 0.3 percent of GDP from 0.5 percent during the same time framework.¹⁷

Table A-4: Key Economic/Social Indicators (2)

Public Expenditure as per GDP (1997, estimate)	23.1 %
Central Gov. Fiscal Deficit as per GDP (1997)	-0.5 %
Current Account Balance as per GDP (1997)	-1.7 %
Debt Service Ratio (1997, estimate)	31.3 %
Population Growth, (Annual Average 1993-97)	2.52 %
Population Growth, (End of Period, 1997)	1.7 %
Compensation of Employees as % of GDP (Current, 1995)	31.1%
Unemployment Rate (December 1997)	2.8 %
Income Share of Richest 20% (1992)	55.6 %

Sources: EIU, *Country Profile*, Dec 1997, Institute of International Finance, *Mexico Economic Report*, Feb 1998, World Bank, *Country Assistance Strategy*, Nov. 1996, OECD, *Economic Survey 1998, Mexico*, February 1998, Banco de México, *The Mexican Economy 1998*

¹⁶ EIU, *Op. cit.*, 1st Quarter 1998

¹⁷ To be noted that macroeconomic variables as given in PRONAFIDE are presented not as forecasts but rather as trend evolutions that serve as a benchmark, while developments from one year to another could fluctuate around the baseline. (Ref: OECD, *Economic Surveys 1998, Mexico*, 1998, Banco de Mexico, *The Mexican Economy*, 1998, June 1998)

b. **Peso Plunge in August 1998**

With jitters over Russia and fears that Venezuela could be forced to follow Moscow's lead and devalue against the US currency, the shock wave swept Mexican and other Latin American markets in the end of August 1998. The Mexican peso, battered to a new historic low of 9.78 per dollar on 21 August 1998, was being quoted at a sliver under 10.0 to the US currency at the international airport foreign exchange booths over the weekend, while culminating in a sharp outflow of funds and raising the prospect of further hemorrhaging. Provided that the trend in the finance markets liners for sometime to come, imports become costly, forcing local prices upward. With this in view, few analysts foresee inflation coming in below 14 percent for 1998, while the government has thus far declined to revise the country's inflation target of 12.0 percent for the same year. In the financial market, the benchmark 28-day government treasury certificates (*cetes*) rose to 36.94 percent, a dramatic 978 basis point leap, on 8 September 1998 to a 28-months high, while the stock market (*Bolsa*) IPC index rose for a second day and the peso remained unchanged at 10.26 per US dollar.¹⁸

In the meantime, the government seems currently not ready for market intervention by way of injecting more dollars from the reserves to support the exchange rate. Also, the government has already been forced to cut \$4 billion in spending from its 1998 budget due to the 10-year lows of crude oil prices. Oil prices have not yet recovered to the point that would allow Mexico to avoid further budget adjustments. Nonetheless, Under-Secretary for Revenue is quoted as saying that the Ministry of Finance has virtually ruled out further budget cuts this year because the 1999 budget has to be sent to Congress by mid-November.

¹⁸ Source: *The News*, 9 September 1998

Table A-5: Economic Indicators

	Actual										Estimate		Project	
	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998		
86-96 Av.														
GDP (\$ bil. Current) 2/														
GDP (Peso bil. Current) 6/	193.3	390.4	507.6	686.4	865.2	1,019.2	1,127.6	1,419.1	1,835.5	2,508.0	3,260.3	402.5		
GDP (Peso bil. 1993 price) 8/				1,140.8	1,189.0	1,232.2	1,256.2	1,311.7	1,230.8	1,294.5	1,385.2			
GDP p.c. (\$ Current) 5/						4.097	4.421	4.535	3.029	3.468	4.091			
Real GDP GR 1/	2.0	1.9	1.2	4.2	5.1	3.6	2.0	4.4	-6.2	5.1	7.0			
Inflation (CPI, %)	159.1	51.7	19.7	29.2	19.8	11.9	8.0	7.1	52.0	27.7	15.7			
Current Account Deficit (% of GDP) 2/														
Total External Debts (% of GDP) 5/						36.2	38	38.6	60.2	50	38.5	34.9		
Net Public Debt (% of GDP) 2/3/	73	61.9	55.1	45.8	35.8	26.7	21.9	21.9	31.3	28.6	22.3			
Debt Service Ratio 5/				37.7%	45.0%	32.8%	34.2%	28.9%	35.2%	35.1%	21.8%			
Exports (\$ bil.) 2/	27.6	30.7	35.2	40.7	42.7	46.2	51.9	60.9	79.5	96.0	110.4			
External Debt Services (\$bil.) 2/				16.1	16.1	20.8	17	20.8	23	33.8	38.8			
Total External Debts (% of GDP) 2/								33.7	59.2	49.8	38.2			
Interest Payments (% of GDP) 2/4/				9.6	5.1	3.9	2.9	2.3	4.6	4.4	4.1			
Fiscal Deficit (% of GDP) 5/						-1.4	-0.3	0.7	0.6	0.5				
Public Sector Deficit (% of GDP) 2/ to 35				-2.2	-0.4	1.4	0.7	-0.3	-0.2	-0.1	-0.7			
Unemployment Rate, % of Labor Force	3.8	3.9	3.5	2.9	2.7	2.8	3.4	3.6	6.3	5.5				
3-month CETES (interest rate)	102.8	58.65	44.77	35.03	19.82	15.89	15.5	14.62	48.24	32.91	19.9			
Deposit Rate (average cost of funds)						15.7	15.3	13.3	39.2	28.4	20.5			
Real Deposit Rate 5/						0.2	5.2	5.9	3.1	-4.3	0.1			
Compensation of employee, % of GDP 1/	30.5	26.8	26.2	29.5	30.9	32.9	34.7	35.3	31.1					
Av. Remuneration p.c. 7/			5,150	6,547	8,406	10,966	13,624	15,891	17,819	20,877	25,776			
Public Sector			8,872	11,292	14,862	19,291	23,863	29,308	34,047	39,485	49,463			
Private Sector			4,258	5,447	6,985	9,184	11,572	13,278	14,687	17,711	21,143			
Minimum Wage, nationwide, Jan	2.8	7.0	7.8	10.8	12.1	13.1	14.0	15.0	20.7	24.3	28.0			
Minimum Wage, DF & A region	3.1	7.8	8.6	11.9	13.3	14.3	15.3	16.3	22.6	26.5	30.2			
Real Minimum Wage Index (1985=100) 2/	86.1	75.2	70.3	63.8	61	58.2	57.3	57.3	50.2	46	48.4			
Exchange Rate (Period Ave) 2/ 6/	1,378	2,273	2,461	2,813	3,018	3,0949	3,1156	3.37	6.4	7.6	8.1	9.1		
Population (mil) 3/	81.2	82.84	84.49	86.15	87.84	89.54	91.21	93.01	91.1	92.9	94.7			
GDP/P bil. Current 1/	193.3	390.5	416.3	548.9	738.9	949.1	1,125.3	1,256.2	1,420.2	1,837.8	2,544.2			
GDP p.c. (P. Current)						25.7	17.6	10.0	17.3	20.0				
Av. Nominal Earnings Change (%)						1.9	1.4	3.1	2.0	2.5	2.7	2.3		
Industrialized Countries real GDP Growth Rate 5/	3.3	4.3	3.2	2.0	0.4	3.9	3.4	5.1	6.1	5.6	5.9	6.2		
\$LJIBOR (6-month, av.) 5/														
Brent spot oil price (\$/brr. av.)				19.34	17.03	15.82	17.06	20.65	19.1	18.5				
Mexico crude oil export price (\$/brr)				14.85	13.29	13.88	15.58	18.23	16.87	13.97				

	Actual										Estimate		Project	
	86-96 Av.	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	
GDP by Origin (% current pr)														
Agriculture, Forestry, Fishing					7.2					5.0		5.2		
Mining					2.1					1.6		1.3		
Manufacturing					19.0					19.1		20.1		
Construction					3.6					3.7		4		
Electricity, Gas, and Water					1.2					1.2		1.5		
Commerce, Restaurants, Hotels					22.6					19.2		18.5		
Transport, Communication					8.3					9.1		9.9		
Finance, Insurance, real estate					12.1					16.8		15.3		
Community Service					16.3					20.7		21.2		
Imputed Banking Services 2/										96.4		-2.7		
GDP by Origin (P bil, current pr)														
Agriculture, Forestry, Fishing										71.0				
Mining										22.7				
Manufacturing										271.3				
Construction										52.5				
Electricity, Gas, and Water										17.0				
Commerce, Restaurants, Hotels										272.7				
Transport, Communication										129.2				
Finance, Insurance, real estate										238.6				
Community Service										294.0				

1/ -1988:1980 price basis, 1989-1996:1993 price basis, OECD 1998

2/ Source: Banco de Mexico, The Mexican Economy 1998

3/ EIU, Country Profile, Mexico 1997-98, IMF/IFS (1991-1994)

4/ total interest payments of the budgetary public sector

5/ Institute of International Finance, Mexico Economic Report, 1998(1995-98), IMF, IFS, (1987-94)

6/ IMF, International Financial Statistics, July 1998

7/ INEGI, Ingreso y Gasto, 1997, p.29

8/ Banco de Mexico, The Mexican Economy 1998

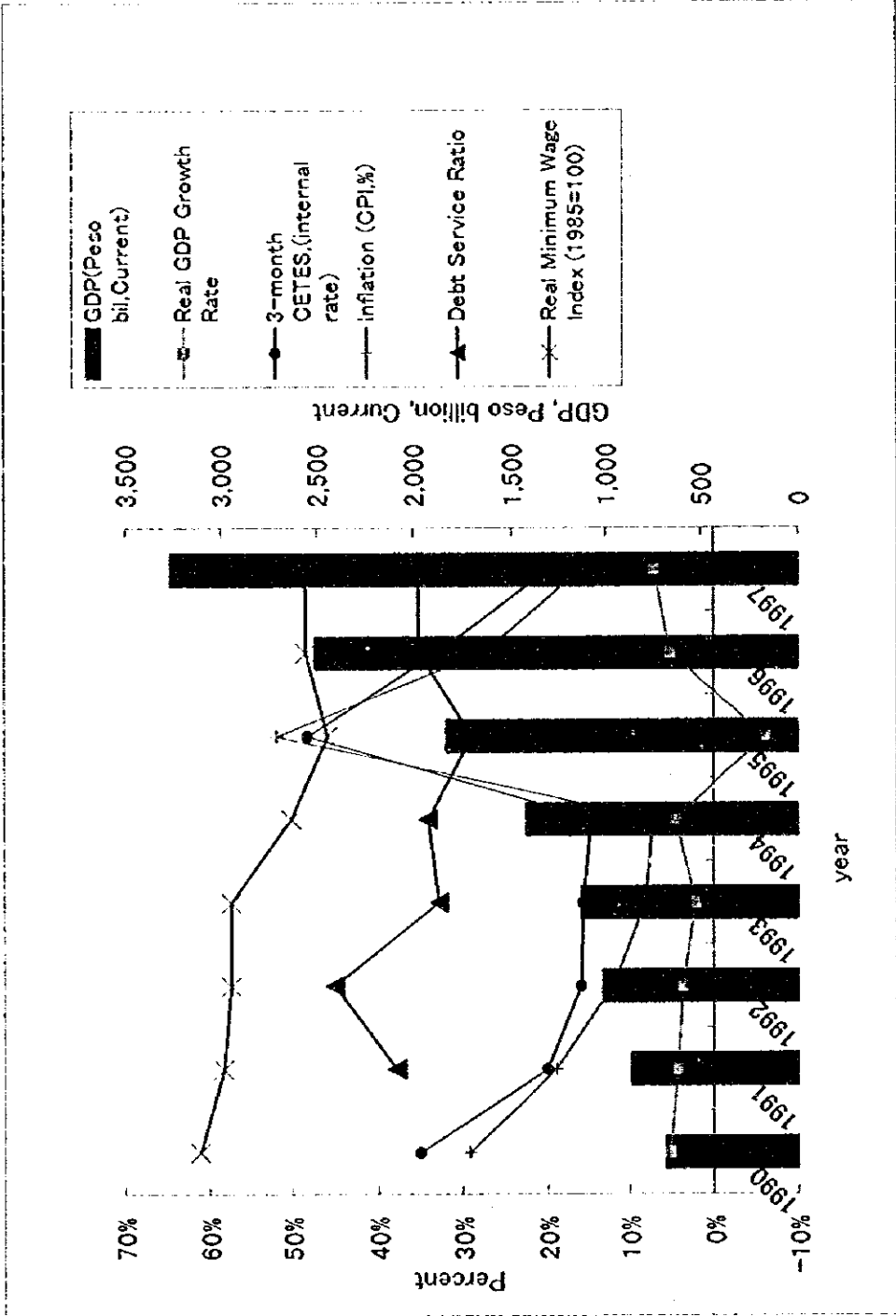


Figure A-4: Chronological Change in Macro Indicators, 1990 - 1997

A.2.2 Regional Economy, Federal District

The United Mexican States is divided into five major regional groups, vis-à-vis, North, Central, South, East, and West, with the numbers of states therein ranging 10, eight¹⁹, six, four, and four, in that order. Administratively, the Federal District (DF) is a part of the Central region with other seven states inclusive of State of Mexico, Guanajuato, Guerrero, and the remaining.

A.2.2.1 Macroeconomic Indicators

As is well aware of, the DF is the center of national activities, of government, of industry and trade, of finance and commerce, and of education and culture. On the economic front, the nominal Gross Regional Product (GRP) was \$ 97.0 billion in 1997 while accounting for 24.1 percent of the aggregate supply of the country. Of this, the largest chunk emanated from the service sector with 23.1 percent followed by other major sectors, vis-à-vis, the manufacturing, Trade, Finance and Insurance, Transportation and Communication, Construction, Mining, and Agriculture and Livestock sector while each of which accounting for 21.6 percent, 21.3 percent, 16.7 percent, 10.8 percent, 6.1 percent, 0.3 percent, and 0.1 percent, in that order.²⁰ As shown above, little contribution has been made to GRP from the primary sector that pertains to the Agriculture and Livestock, and the Mining sub-sectors therein in DF.

With the total population of a little less than 8.5 million (9.3 percent of the country's total population), the nominal Gross Regional Product (GRP) per capita of DF was about \$11,426 in 1997 which stands at around 2.6 times higher than the aggregate national products per capita. Annual average rate of growth in GRP for DF over the period of 1990 through 1996 was 2.1 percent, whereas that remained 3.5 percent during the period of pre-currency crisis in the end of 1994.

Viewed in this light, productivity of human resources, as borne out by the GRP per capita, in DF was placed well above the national average, while reflecting an extreme supremacy in the economy. State profiles in numerical and visual information are attached as Table A-6 and Figure A-6, respectively.

¹⁹ Correctly, the Central region comprises seven states and Distrito Federal.

²⁰ Source: *Ibid.*, p.127

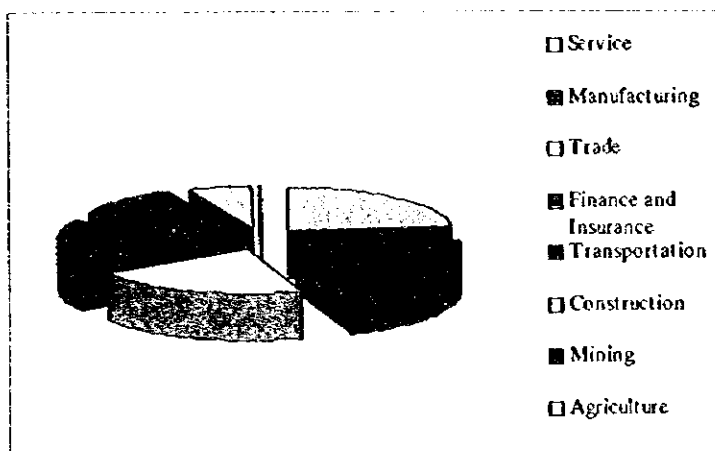


Figure A-5: Industrial Structure of DF, 1997

A.2.2.2 Mexico Valley Metropolitan Zone (ZMVM)

In the meantime, DF constitutes part of the Mexico Valley Metropolitan Zone (ZMVM) with a geographical segment of the State of Mexico. In aggregate, ZMVM has a geographical area of 9,000 sq. kilometers at the altitude of 2,240 meters from the sea level. Population in the region was around 17 million while accounting for 18.9 percent of the country's aggregate in 1995.

As regards the labor market in ZMVM, around a quarter of the workforce in the country's secondary and the tertial sectors are in the region in 1995. Specifically, the manufacturing and the commerce sub-sectors registered respective of around 2.1 million (24.5 percent) and 5.1 million (27.0 percent) out of the total workforce of 34.3 million in Mexico in the same year.²¹ The lawful minimum wage in the region during the period of January through March 1998 was P30.2 per day, whereas the national average remained 7.3 percent lower at P27.99.²²

²¹ References: Pan-American Health Organization, "Análisis Sectorial de Residuos Sólidos en la Zona Metropolitana de Valle de México", #14, February 1998, and International Monetary Fund (IMF), "International Financial Statistics", 1997

²² Source: INEGI, Mexican Bulletin of Statistical Information, #27, June 1998, p.124

Table A-6: State and DF Profiles, 1997

	Actual Figures			Percentage Share			
	Land Area (sq. km)	Population ('000)	Firms ('000)	Land Area	Population	Firms	GNP
North (10 States)	1,119,437	20,812	489	57.3%	22.8%	22.3%	24.5%
Baja California	69,921	2,112.1	47.2	3.6%	2.3%	2.2%	2.5%
Baja California Sur	73,475	375.5	10.9	3.8%	0.4%	0.5%	0.5%
Coahuila	149,982	2,173.8	54.0	7.7%	2.4%	2.5%	2.8%
Chihuahua	244,938	2,793.5	64.1	12.5%	3.1%	2.9%	2.9%
Durango	123,181	1,431.7	29.4	6.3%	1.6%	1.3%	1.2%
Nuevo Leon	64,924	3,550.1	89.9	3.3%	3.9%	4.1%	6.5%
Sinaloa	58,328	2,425.6	49.4	3.0%	2.7%	2.3%	2.2%
Sonora	182,052	2,085.5	48.0	9.3%	2.3%	2.2%	2.6%
Tamaulipas	79,384	2,527.3	65.8	4.1%	2.8%	3.0%	2.6%
Zacatecas	73,252	1,336.5	29.8	3.7%	1.5%	1.4%	0.8%
Central (7 States & DF)	257,802	33,277	838	13.2%	36.5%	38.3%	45.8%
Aguascalientes	5,471.0	862.7	24.7	0.3%	0.9%	1.1%	0.9%
Distrito Federal	1,479.0	8,489.0	303.8	0.1%	9.3%	13.9%	24.1%
Estado de Mexico	21,335.0	11,707.9	226.0	1.1%	12.8%	10.3%	10.5%
Guanajuato	30,491.0	4,406.6	105.9	1.6%	4.8%	4.8%	3.5%
Guerrero	64,281.0	2,916.6	60.2	3.3%	3.2%	2.8%	2.0%
Morelos	59,928.0	1,442.7	42.7	3.1%	1.6%	2.0%	1.6%
Queretaro	11,749.0	1,250.5	27.0	0.6%	1.4%	1.2%	1.4%
San Luis Potosi	63,068.0	2,200.7	47.9	3.2%	2.4%	2.2%	1.8%
South (6)	332,856	11,465	252	17.0%	12.6%	11.5%	9.2%
Campeche	50,812.0	642.5	17.3	2.6%	0.7%	0.8%	1.6%
Chiapas	74,211.0	3,584.8	65.5	3.8%	3.9%	3.0%	1.8%
Oaxaca	93,952.0	3,228.9	69.2	4.8%	3.5%	3.2%	1.7%
Quintana Roo	50,212.0	703.5	18.1	2.6%	0.8%	0.8%	1.3%
Tabasco	25,267.0	1,748.8	27.8	1.3%	1.9%	1.3%	1.5%
Yucatan	38,402.0	1,556.6	53.7	2.0%	1.7%	2.5%	1.3%
East (4)	130,430	14,358	323	6.7%	15.8%	14.8%	10.3%
Hidalgo	20,813.0	2,112.5	39.1	1.1%	2.3%	1.8%	1.6%
Puebla	33,902.0	4,624.3	123.6	1.7%	5.1%	5.7%	3.2%
Tlaxcala	4,016.0	883.9	22.8	0.2%	1.0%	1.0%	0.6%
Veracruz	71,699.0	6,737.3	137.6	3.7%	7.4%	6.3%	4.9%
West (4)	112,911	11,247	285	5.8%	12.3%	13.0%	10.2%
Colima	5,191.0	488.0	15.5	0.3%	0.5%	0.7%	0.6%
Jalisco	20,813.0	5,991.2	151.8	1.1%	6.6%	6.9%	6.6%
Michoacan	59,928.0	3,870.6	95.0	3.1%	4.2%	4.3%	2.3%
Nayarit	26,979.0	896.7	22.9	1.4%	1.0%	1.0%	0.7%
Total	1,953,436	91,158	2,187	100%	100%	100%	100%

Order by Size of Aggregate Products

State	GRP Share	Accumulative GRP Share
1 Distrito Federal	24.1%	100.0%
2 Estado de Mexico	10.5%	76.0%
3 Jalisco	6.6%	65.5%
4 Nuevo Leon	6.5%	58.9%
5 Veracruz	4.9%	52.4%
6 Guanajuato	3.5%	47.5%
7 Puebla	3.2%	44.0%
8 Chihuahua	2.9%	40.8%
9 Coahuila	2.8%	37.9%
10 Sonora	2.6%	35.1%
11 Tamaulipas	2.6%	32.5%
12 Baja California	2.5%	29.9%
13 Michoacan	2.3%	27.4%
14 Sinaloa	2.2%	25.1%
15 Guerrero	2.0%	22.9%
16 San Luis Potosi	1.8%	20.9%
17 Chiapas	1.8%	19.1%
18 Oaxaca	1.7%	17.3%
19 Campeche	1.6%	15.6%
20 Morelos	1.6%	14.0%
21 Hidalgo	1.6%	12.4%
22 Tabasco	1.5%	10.8%
23 Queretaro	1.4%	9.3%
24 Quitana Roo	1.3%	7.9%
25 Yucatan	1.3%	6.6%
26 Durango	1.2%	5.3%
27 Aguascalientes	0.9%	4.1%
28 Zacatecas	0.8%	3.2%
29 Nayarit	0.7%	2.4%
30 Colima	0.6%	1.7%
31 Tlaxcala	0.6%	1.1%
32 Baja California Sur	0.5%	0.5%

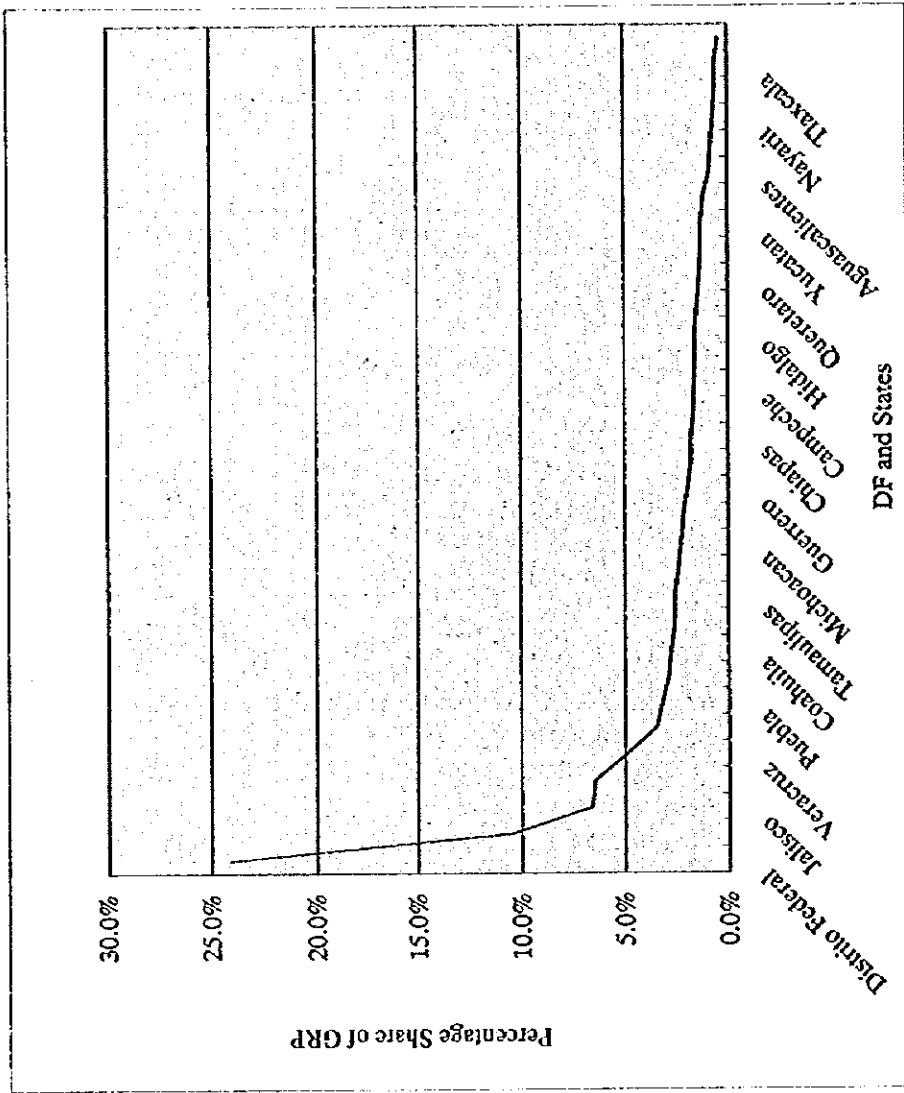


Figure A-6: Order by Size of Aggregate Products

A.2.3 Administration

The Federal District is where the Powers of the Union reside and the capital of the Mexican United States. It is a legal entity, owns patrimony and bears legal capacity to acquire and to own all type of goods which can be necessary to execute activities, functions and public services within its responsibility.

The Department of the Federal District (DDF) had been characterized for more than 55 years (1941 to 1997), unlike the other 31 federative entities, for being governed by a Government Delegate who was appointed by the Republic president.

During this period, government competencies for both federative and municipal entities were equally undertaken by the DDF. Probably this is the main political feature which differentiates the DF from the rest of the country.

From December 1st, 1997, the Federal District has a Governor who is elected through popular election. The current Governor will be in office until 2000.

Each Delegate of the 16 Political Delegations who are currently proposed by the Head of the Government of the DF and ratified by the Legislative Assembly, will be elected through an election process by the end of the year 2000. Consequently, delegations will function as municipalities in a federative entity.

What was described above is shown in the following table:

Table A-7: DF Government Evolution within the National Organizational Framework

From 1947 to 1997	From 1997 to 2000	After 2000
31 Federative Entities integrated Politically, Administratively and Territorially by Free and Sovereign Municipalities	31 Federative Entities integrated Politically, Administratively and Territorially by Free and Sovereign Municipalities	31 Federative Entities integrated Politically, Administratively and Territorially by Free and Sovereign Municipalities
A Federal District consisting of 16 Political Delegations whose executive heads are appointed through the direct political intervention by the Republic President.	The Federal District Governor is elected through popular election who also appoints Political Delegates for the 16 Delegations.	A Federal District integrated by 16 Political Delegations which executive heads will be elected through a democratic election process.

It is necessary to point out that the governmental functions, which will be assumed by the DF and the 16 political delegations beginning in 2000, should be clearly defined by the Congress of the Union. It should establish whether it will have a style which is typical of any other federative entities with its municipalities or it will have a different structure.

The new doctrine, related to the changes in the DF government, from December 1st 1997, are proclaimed in the decree published in the official Paper of the Federation on the same date. This decree reforms the **Internal Regulation** of the Public Administration of the Federal District which is sustained by **Government Statute of the DF** published on **22nd of April, 1998** in the DF Official Gaceta. This regulatory instrument establishes that the Head of the Federal District Government will be in charge of the local executive organs; public administration will be under the

responsibility of just one person who will be elected through free, direct and secret universal voting following the regulations and the electoral law issued by the DF Legislative Assembly.

On the other hand, the Government Head election will take place every 6 years on the same day with the election for Constitutional President of the Mexican United States. Furthermore, it is established that the Government Head could be removed by the Senators Chamber within the Congress of the Federation; additionally, a person who will replace the Governor and finish the term could be named (following a proposal from the president of the Republic). Meanwhile, the DF Legislative Assembly appoints him/her.

Moreover, regarding the DF's political administrative structure, the following should be pointed out:

The DF government is in charge of the Federation Powers and the local Legislative, Executive and Judicial powers; these are:

- The DF Legislative Assembly.
- The DF Government Head.
- The Justice Superior Court.

The DF Legislative Assembly (ALDF) has the fundamental function of legislating matters for the DF in areas that are specifically conferred to the assembly by the Political Constitution of the Mexican United States. Among the most important powers related to urban cleansing, the ALDF has responsibility for:

- Issuing legal precepts to organize public treasury, major accounting and budget, accounting and public expenditure of the DF.
- Legislating to preserve the environment and ecological protection.
- Regulating the provision and concession of public services.
- Legislating for cleansing services.

The Head of Government in the DF, regarding Urban Cleansing, has the power to:

- Sign coordination agreements with the Federation, States and Municipalities and also conciliation agreements with social and private sectors.
- Sign coordination agreements regarding hazardous waste which are considered of low hazardousness respecting what is established in the General Law of Ecological Balance and Environmental Protection.
- Agree with the Federation, bordering States and Municipalities on the constitution, integration and operation of "Metropolitan Commissions for the collection, treatment, and disposal of solid waste".
- Sign agreements with the Federation, bordering States and Municipalities, respecting what is established by the Metropolitan Commissions, in order to define territorial and functional scopes regarding the provision of public services.

The main task of the **DF Justice Court** is to apply the judicial function in the territory of that entity, following what is established by the Organic Law.

To execute the Public Administration task, the DF headquarter is supported by several **Centralized Administrative Units** as well as some **decentralized organs**. The main Centralized Administrative Units are the following:

- Secretariat of Government.
- Secretariat of Urban Development and Housing.
- Secretariat of Economic Development.
- Secretariat of Environment.
- Secretariat of Works and Services.
- Secretariat of Finance.
- Secretariat of Transportation and Roads.
- Secretariat of Public Security.
- Main Officer.
- General Controllorship.

The decentralized administrative organs over which government management is sustained are called **Political Delegations** which have functional autonomy over its territory.

The DF Public Administration has, within its responsibility, public services established by the law, regarding administrative and financial management. Public services could be given as concession, in case where it is required by the general interest and the nature of the services can allow this to take place. Concession could be given to those who meet the requirements as stipulated in the Law, but only after a declaration were issued by the Government head.

A.2.4 Population

a. Population Trend in the GDF

The National Census, which started in 1895 in Mexico, has been implemented every 10 years since 1930. The last one was the 11th National Census, conducted in 1990. Besides, an extra census focusing on only population and the number of households were carried out in 1995.

Population and average annual population growth rate of the DF, State of Mexico and the country from 1930 to 1995 are presented in Table A-8.

Table A-8: Population and Population Growth of the DF, State of Mexico and the Country

Year	DF		State of Mexico		MEXICO		Ratio of DF to MEXICO (%)
	Population persons	Average Annual Growth Rate (%)	Population persons	Average Annual Growth Rate (%)	Population persons	Average Annual Growth Rate (%)	
1930	1,229,576	---	990,112	---	16,552,722	---	7.4
1940	1,757,530	3.6	1,146,034	1.5	19,652,552	1.7	8.9
1950	3,050,442	5.7	1,392,623	2.0	25,779,074	2.8	11.8
1960	4,870,876	4.8	1,897,851	3.1	34,923,126	3.1	13.9
1970	6,874,165	3.5	3,833,185	7.3	48,325,238	3.3	14.2
1980	8,831,079	2.5	7,564,335	7.0	66,846,833	3.3	13.2
1990	8,235,744	-0.7	9,815,795	2.6	81,249,645	2.0	10.1
1995	8,489,007	0.6	11,707,964	3.6	91,158,290	2.3	9.3

Source: Estadísticas Históricas México, INEGI, DGE

In the table above, the average annual population growth rate was calculated using the formula shown below.

$$r = (Pp/Pb)^{1/n} - 1$$

where r : Population growth rate per year
 Pp : Population at time p
 Pb : Population at time b , i.e. n years earlier
 n : Period from time p to time b expressed as the number of years

The annual population growth rate of the DF varied from 2.5% to 5.7% during the 50 years from 1930. The population of the DF had accounted for more than 10 % of that of whole country from 1950 to 1980. The growth rate of the DF during 1980 - 1990 was less than zero. It has been recovered from 1990 to 0.6%, which is, however, lower than the growth rate of the State of Mexico and the country.

Population growth in the DF until the 1980s is presumably attributed to immigration from other cities and rural areas for more job opportunities and better living standards. The population trend since the 1980s reflects the recent urbanization in the entire Metropolitan Zone which covers the DF and surrounding municipalities in the State of Mexico.

Table A-9 shows the demographic essence of the DF extracted from the 1990 Census.

Table A-9: Key Population Indicators of the DF (1990 Census)

Total population	8,235,744
Male population	3,939,911
Female population	4,295,833
Average household size	4.58
Annual average population growth rate 1980-1990	-0.70%

b. Population Projection Method for the DF

The projection of DF's population is attempted by several institutions including PAHO, whose study results are shown in the PAHO's report.

The DGSU calculates the population for each year using the results of the 1990 Census and the predetermined population growth rate of each delegation (see Table A-10).

The predetermined annual growth rate was officially reported by the Department of the DF (DDF) in 1996. On the other hand, PAHO's population estimation was based on different growth rate based on their own study. Accordingly, there is a disparity in the result of population estimation by the DGSU and PAHO. Annual population growth rate used by PAHO was 0.59%, which was applied to all delegation.

The present study will follow the method of the DGSU to estimate the DF's population.

Table A-10: Predetermined Population Growth Rate for Delegations

Delegation	1990 - 1995	1996 - 2000	2001 - 2010
Alvaro Obregon	1.22	0.44	0.47
Azcapotzalco	-1.64	0.25	0.28
Benito Juarez	-1.68	0.25	0.28
Coyoacan	1.71	0.45	0.58
Cuajimalpa	3.53	1.72	1.75
Cuauhtemoc	-2.13	0.30	0.33
Gustavo A.Madero	0.89	0.10	0.13
Iztacalco	-1.59	0.03	0.41
Iztapalapa	2.65	0.53	0.68
M.Contreras	2.05	1.28	0.61
Miguel Hidalgo	-2.13	0.30	0.33
Milpa Alta	3.00	1.39	1.43
Tlahuac	4.46	1.40	1.71
Tlalpan	3.97	0.98	1.01
V.Carranza	-2.04	0.26	0.29
Xochimilco	3.22	1.40	0.99
Total in the DF	0.60	0.50	0.57

Source: Programa General de Desarrollo Urbano del Distrito Federal Version 1996, DIARIO OFICIAL 15 de julio de 1996.

c. Estimated Population

The result of population estimation for the whole DF and delegations for 1997, where population data of the 1990 Census and predetermined population growth rate shown in Table A-10 were used, is presented in Table A-11 together with data of the 1990 and 1995 censuses.

Table A-11: Estimated Population of the DF for 1997

Delegation	Population(persons)		
	1990 (Census)	1995 (Census)	1997 (Estimated)
Alvaro Obregon	642,753	676,930	688,923
Azcapotzalco	474,688	455,131	439,188
Benito Juarez	407,811	369,956	376,576
Coyoacan	640,066	653,489	703,086
Cuajimalpa	119,669	136,873	147,340
Cuauhtemoc	595,960	540,382	538,315
Gustavo A.Madero	1,268,068	1,256,913	1,214,625
Iztacalco	448,322	418,982	414,048
Iztapalapa	1,490,499	1,696,609	1,717,259
M.Contreras	195,041	211,898	221,463
Miguel Hidalgo	406,868	364,398	367,495
Milpa Alta	63,654	81,102	75,866
Tlahuac	206,700	255,891	264,349
Tlalpan	484,866	552,516	600,703
V.Carranza	519,628	485,623	471,241
Xochimilco	271,151	332,314	326,658
Total GDF	8,235,744	8,489,007	8,567,135

As seen in the table, total population of the DF in 1997 is estimated at 8,567,135. This and the population data of the 1990 Census give an average annual population growth rate of about 0.6%.

The figures shown in Table A-11 are to be used in the present study.

d. Population of State of Mexico

Wastes discharged in part of the State of Mexico are brought to the S/Ps and/or the final disposal sites run by the GDF, and it might not be expected in the current situation that a substantial change of wastes import from these municipalities takes place in the near future. Thus, it is important to estimate future population in those municipalities as well. For this purpose, the survey results of the 1995 census and average annual population growth rate used in the PAHO's report were applied.

Table A-12 listed the names of 11 municipalities which bring their wastes to the DF's SWM system and shows the 1995 census data and population estimated for 1997.

Average annual population growth rate from 1995 to 1997 for those municipalities is calculated to be 5.7%, which is much higher than that of the DF.

Table A-12: Population of Selected Municipalities in the State of Mexico

Municipalities of State of Mexico	Population		
	1995 (persons)	1997 (persons)	Average Annual Growth Rate (%)
Atenco	27,988	28,078	0.16
Chalco	175,521	179,120	1.02
Chiautla	16,602	16,636	0.10
Chiconcuac	15,448	15,476	0.09
Cuatitlan Izcalli	417,647	438,191	2.43
Ecatepec	1,457,124	1,714,099	8.46
Ixtapaluca	187,690	191,804	1.09
Nezahualcoyotl	1,233,868	1,417,413	7.18
La paz	178,538	182,271	1.04
Texcoco	173,106	176,620	1.01
Valle del Chalco	287,073	296,741	1.67
Total	4,170,605	4,656,449	---

A.2.5 Industrial Structure of Mexico

In respect of the industrial structure, there has been considerable annual variation in performance by sectors on the economic front, reflecting the uncertain course of macroeconomics policies and the economy's vulnerability to external shocks. Mexico is predominantly a service-producing country with the tertial sector accounting for about 68.3 percent of the aggregate supply in 1996, whereas the primary and the secondary sectors contributed 5.4 percent and the balance 26.3 percent in the same year, respectively. Desegregating the aggregate supply in the economy by sectors, the largest chunk emanates from the manufacturing sector while accounting for 19.6 percent, followed by the commerce/restaurants and hotels sector, personal services, financial services, transport and communications, agriculture, construction, mining, and electricity/gas and water sector with 19.3 percent, 19.3 percent, 16.0 percent, 9.7 percent, 5.4 percent, 3.9 percent, 1.7 percent, and 1.1 percent, in that order. Of this construction, commerce/restaurants and hotels, manufacturing, and transport and communications were, among others, the fastest growing sub-sectors during 1997, with the average output growth rates of 10.2 percent, 9.9 percent, 9.8 percent, and 9.5 percent, in descending order. It would be noted that contribution of the sectors that have high linkages with manufacturing activities, vis-à-vis, transport and communications, construction, and electricity/gas and water, is somewhat moderate comparing to manufacturing.

As regards the manufacturing sector, the metal products, machinery and equipment sub-sector holds the largest share with 5.9 percent of GDP, followed by food, beverages and tobacco sub-sector, the chemical, petroleum products, rubber and plastics sub-sector, the clothing and footwear sub-sector, the non-metallic minerals except oil sub-sector, and the others, each of which accounting for 5.0 percent, 3.0 percent, 1.7 percent, 1.4 percent, and the balance 2.6 percent of GDP, in that order. Of this, the annual growth rates of the metal products, machinery and equipment sub-sector, the printings, the basic metal, and other industries were above the sectoral

average of 9.8 percent, with 16.9 percent, 13.7 percent, 12.9 percent, and 12.6 percent, respectively.²³

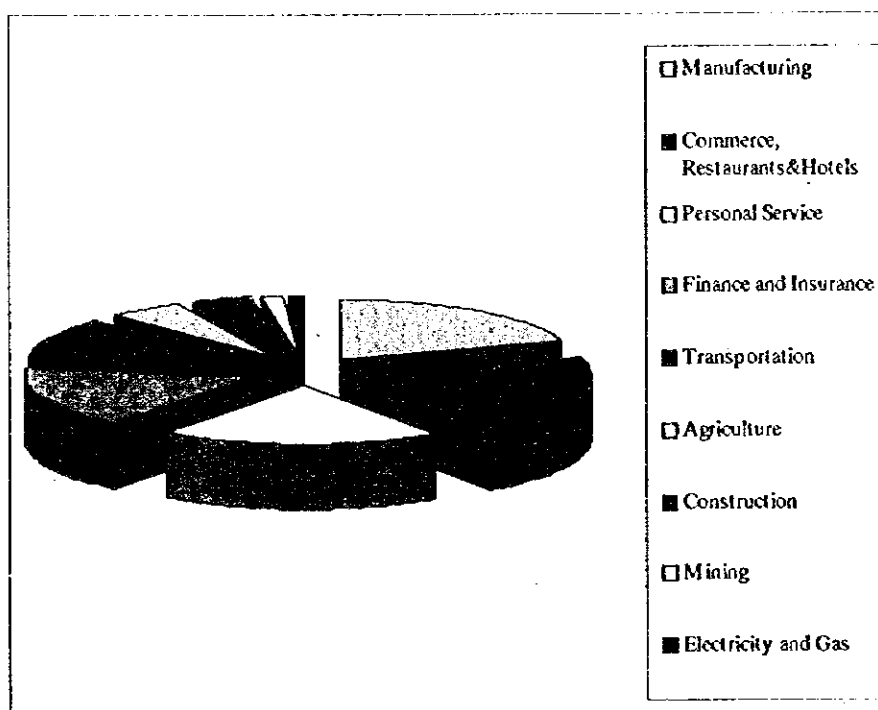


Figure A-7: Industrial Structure in Mexico, 1997

A.2.6 Education

The correlation between the education of population and public cleaning leaves no room to doubt. In general terms, the higher the education level of the population is, the greater environmental and ecological consciousness will be, as well as better personal hygiene and cleaning customs for their housing and public areas. Besides, it will be better prepared to take part in the management of its urban services, including public cleaning.

Illiterate population aged 15 years and older in the DF amounted to 182,000 people in 1995, which is the last information, and represented 3.0% of the 6,122,000 inhabitants. This illiteracy rate is very low if compared with that at a national level (10.6%). On the other hand, and as in the rest of the country, illiteracy rate among women (2.2%) is almost three-fold of that of men (0.8%). Within the 16 delegations that form the DF, Benito Juarez (1.3%) is the one with the lowest illiteracy rate, and Milpa Alta has the highest (5.7%) (Table A-13).

²³ Source: Banco de Mexico, *The Mexican Economy 1998*, June 1998, Table 11

Table A-13: Illiterate Population Aged 15 Years and Older in the DF, by Delegation and by Sex Group (Nov. 1995)

Delegation	Total population (000)	Illiterate population			
		Illiterate population (000)	% Total	% Men	% Women
Federal District	6,122	182	3.0	0.8	2.2
Azcapotzalco	337	8	2.3	0.6	1.7
Coyoacán	493	11	2.2	0.6	1.6
Cuajimalpa de Morelos	93	4	3.8	1.1	2.6
Gustavo A. Madero	909	27	3.0	0.8	2.2
Iztacalco	307	8	2.6	0.7	1.9
Iztapalapa	1,160	42	3.6	1.0	2.6
Magdalena Contreras, LA	150	6	4.0	1.3	2.7
Milpa Alta	53	3	5.7	1.9	3.8
Alvaro Obregón	485	16	3.3	0.8	2.5
Tlahuac	170	7	4.1	1.2	2.9
Tlalpan	394	13	3.3	1.0	2.3
Xochimilco	228	9	3.9	1.3	2.6
Benito Juárez	297	4	1.3	0.3	1.0
Cuauhtémoc	408	9	2.2	0.5	1.7
Miguel Hidalgo	282	6	2.1	0.4	1.8
Venustiano Carranza	357	9	2.5	0.5	2.0

Source: Prepared by the Study Team, based on INEGI's "Anuario Estadístico del Distrito Federal", year 1997.

Regarding the school level of the population aged 6-14 years, the "1996 Population and Housing Counting" shows that in 1995, 97.3% of this age group attended schools; this represented an increase over 1990, when the attendance rate was 95.1%. This percentage also shows that the DF is in better conditions than other states in the country, taking into account that the mean attendance rate is 92.2%.

Table A-14 shows the number of pupils that registered in the different educational levels, teachers, schools and classrooms in the DF for the 1995-96 period.

Table A-14: The Number of Pupils Registered, Teachers, Number of Schools and Classrooms in the DF (1995-96)

Educational level	Pupils registered	Teacher staff	Schools	Classrooms
1. Preschool	307,808	12,026	2,513	11,865
2. Primary level	1,105,368	39,421	3,336	41,945
3. Training for work	183,269	4,710	594	3,447
4. Secondary	522,634	34,582	1,279	13,247
5. Intermediate Professional	62,030	6,481	151	1,944
6. High school	325,103	21,697	506	8,820
Total DF	2,506,212	118,917	8,379	81,268

Source: Prepared by the Study Team, based on INEGI's "Anuario Estadístico del Distrito Federal", year 1997.

The education plans and programs for primary level schools, elaborated by the Secretariat of Public Education and applied to the country as of September 1993, stipulates as one of their objectives that children acquire "the basic knowledge to understand natural phenomena, specially those related to the preservation of health, the protection of the environment and the rational use of natural resources".

According to the aforementioned, the subjects known as Natural Sciences - to a greater extent- and Civic Education - to a less extent - went through some issues related to the use of drinking water, air, water and soil pollution, origin and fate of the wastes generated by houses and the community, organic and inorganic garbage, although these topics account for only 10% of the total issues in Natural Sciences.

A.2.7 Community Structure

The DF consists of 16 political delegations, which are divided at the same time into *colonias*, *manzanas* (blocks) and *calles* (streets).

In semi-rural delegations such as Milpa Alta, Cuajimalpa, Magdalena Contreras, Xochimilco and Tlahuac, there exist *pueblos* (villages) or *barrios* (neighborhoods), apart from the *colonias*.

Up to March of this year (1998), the structure of the delegation was the following:

In the DF, there exist 16 residents' associations, one per each political delegation. Each association is represented by a president, who coordinates the *colonia* heads and the latter coordinate the *manzana* leaders.

The residents' associations have the task of representing the neighbors in the demand of their needs and community concerns. They play the role of managers and advisors, as they are the official representatives of neighbors before the Government of the Federal District, which is in turn represented by the political delegations.

Due to political reasons, the residents' associations do not have great influence on the community for many years, as they moved apart from their supposed positions and lost initial commitments to the population they represented.

The participation of the residents' associations, the *colonia* heads and the *manzana* leaders will be priceless for the education of the population and its succeeding participation in the improvement of SWM for the DF.

A.2.8 Squatter Settlements

Marginal settlements of squatters, which are known in Mexico as "*colonias populares*" emerged in 1940. Estimations from the year 1976 showed that almost 50% of the metropolitan zone population lived in "*colonias populares*", which accounted for 64% of the urbanized area of the city.

The general condition for the emergence of squatter settlements is the free or low-price availability of land in the peripheral areas, which can be owned or even squatted on by families that demand housing. The features of these settlements are due to the presence of acutely adverse environmental conditions, no public services at all or a limited access to them, or there exists a problem as regards to the land tenure. In most cases, some or all of these factors are combined.

The increasing number of "*colonias populares*" at the northern and northeastern zone of the DF has been fostered by the urbanization and growth of the municipalities in the State of Mexico that surround the DF; as a consequence, the DF has been enclosed at the northern and northeastern zone by the co-urbanized municipalities. In the DF's southern and southwestern zone, that corresponds to the delegations Alvaro

Obregón, Milpa Alta, Cuajimalpa, Magdalena Contreras, Xochimilco and Tlahuac, the squatter settlements are limited due to the special attention by the GDF to preserve the so-called "ecological preservation zones", therefore the "colonias populares" cannot easily constitute in those limits.

Nevertheless, the expansion of squatter settlements in the Metropolitan Zone (co-urbanized municipalities of the State of Mexico) still continues, yet at a slower rate than in previous decades, due to the following reasons:

- Urban and rural migration.
- Precarious economic and concrete deficiencies conditions.
- Migration from other zones in Mexico City because of deteriorated housing which has turned uninhabitable.
- Excessive housing costs.

During the 70's, the governmental bodies started considering some programs aimed at regulating land tenure and the introduction of public services in squatter settlements. The organizations involved in this matter for the Metropolitan Zone are;

- The Urban Action and Social Integration Institute (*Instituto de Accion Urbana e Integracion Social [AURIS]*) of the State of Mexico, created in 1969;
- The Federal District Office's Attorney General's Colonias Populares Office (*Procuraduria de Colonias Populares del Departamento del Distrito Federal*);
- The Housing, Social and Urban Development Trust (*Fideicomiso de Vivienda, Desarrollo Social y Urbano*);
- The National Institute for the Development of Rural Community and Popular Housing (*Instituto Nacional para el Desarrollo de la Comunidad Rural y de la Vivienda Popular [INDECO]*); and
- The Commission for the Regulation of Land Tenure (*Comision para la regulacion de la tenencia de la tierra [CORETT]*).

It is estimated that there exist more than 300 "colonias populares" in the DF, specially in the following delegations: Alvaro Obregón, Coyoacan, Iztacalco, Iztapalapa, Tlalpan, Azcapotzalco, Gustavo A. Madero, Cuajimalpa, Magdalena Contreras, Xochimilco and Tlahuac; most of them originated in communal land (*ejido*) or ravines and former mines.

Besides, there exists a variant type of squatter settlement which is known as *ciudad perdida* ("lost city"). This only means small groups of houses that are built with wasted materials or cardboard, with an absolute lack of public services in most of the cases. These "lost cities" are located on federal lands, adjoined to the railways, on former dumping sites and non-occupied pieces of land, although it is estimated that the total population of such settlement is less than 1%.

According to the INEGI (1995 Population and Housing Counting), in November 1995 houses in the DF without drinking water installations represented only 2% of the total, and those houses whose sewerage was not connected with the public network nor to septic pits accounted for 3.6% of total houses. From the aforesaid, it can be concluded that the "colonias populares" regularization process was developed

significantly. On the other hand, this group of people - almost 400,000 persons - do not have a solid wastes collection service.

Besides, according to the publication "Orientation of the management of solid wastes in Mexico city, July 1992" (*Orientacion del manejo de residuos solidos en la ciudad de Mexico, Julio 1992*), the number of squatter settlements receiving deficient waste collection service reached 42 (most of) which were in nine delegations.

A.2.9 Public Health

The institutions by which the DF attends to public health and renders social security services are grouped as follows:

- Governmental bodies such as the Secretariat of Health and Assistance (SSA) and GDF's Medical Services;
- Social Security Institutions, formed by the Mexican Social Security Institute (IMSS), the Institute of Security and Social Services for State Workers (ISSSTE) and the services rendered by *Petróleos Mexicanos (PEMEX)*, *Ferrocarriles Nacionales de México (Mexican National Railways)*, the Secretariat of National Defense (SDN) and the Secretariat of Navy (SM); and
- The private sector.

Table A-15 shows the infrastructure and the resources of the health sector in the DF in 1995, which is the first place among the States at a national level, with the exception of external consultation units.

The population with insurance to access to medical services accounted for 52% of the DF's population in 1995. The remaining 48% is attended to by governmental institutions, whereas GDF's Medical Services covered 29% in that year.

Table A-15: Infrastructure and Resources of Health Sector in the DF, 1995

Types	DF (Nos.)	Place of order among federative entities
General Hospitals	66	first place
Specialized Hospitals	47	first place
External consultation units	667	9th place
Medical staff	23,450	first place
Paramedics	47,544	first place
Counted beds	18,207	first place
Doctors' offices	7,018	first place
Clinic analysis laboratories	286	first place
Surgery rooms	611	first place

Note: Not including private sector
Source: Secretaría de Salud. Boletín de Información Estadística N° 15, 1995. Vol. 1 Recursos y servicios. México 1996.

It is difficult to establish a direct relation between the inappropriate management of solid wastes and health, since there are several causes for diseases such as poverty, malnutrition and a lack of basic sanitation services, besides lack of or deficient management of solid wastes. However, according to the morbidity and mortality statistics of population in general terms, some infectious diseases are detected that may be prevented or reduced with proper environmental sanitation, including the appropriate management of solid wastes.

Table A-16 shows the morbidity and mortality rates due to diarrhea diseases (one of the causes selected) in the DF delegations in 1991; these figures confirm that the delegations of low socio-economic conditions with deficient sanitation services, such as Milpa Alta, have the highest morbidity and mortality rates.

Table A-16: Morbidity and Mortality due to Diarrhea Diseases in the DF - 1991

Delegation	Morbidity rate	Mortality rate
A. Obregón	1,592	9.0
Azcapotzalco	563	7.8
Benito Juárez	942	7.5
Coyoacán	1,589	6.7
Cuajimalpa	2,180	13.8
Cuauhtémoc	1,050	7.3
G. A. Madero	503	8.7
Iztacalco	951	8.2
Iztapalapa	533	9.8
Magdalena Contreras	1,226	8.6
Miguel Hidalgo	1,257	9.3
Milpa Alta	6,574	23.2
Tláhuac	3,333	10.3
Tlalpan	1,196	8.4
V. Carranza	1,238	9.3
Xochimilco	1,547	11.2

Source: SSA-OPS Rates based on per 100,000 inhabitants.

A.3 Urban Structure

A.3.1 General Situation

The civilization of Mexico City dates from 1325, the year in which the Aztecs founded their capital, Tenochtitlan. The capital was built on an island near the west shore of Texcoco Lake and covered an area of about 10 km². The Aztec Empire extended its power over a wide area which covered present Veracruz, Puebla, Oaxaca, Morelos and Guerrero for about two centuries.

On the other hand, the Aztecs were under the constant threat of flooding due to the geographical feature of the capital. While coping with the natural menace, they had created a beautiful and remarkable city, as described by the Spanish conquerors, with a highly sophisticated network of canals and dikes.

It was when the Aztecs capital, with its population of 100,000, was at the height of its prosperity that the Spanish laid siege to it. As a result, it fell under the colonization of Spain in 1519. The Spanish took over the construction works of hydrological infrastructure to overcome the problems of persistent inundation and sanitation.

It required almost three centuries for Mexico to achieve independence. During the colonization and also after the independence, the area where Tenochtitlan was flourished and the present Mexico City is developed has always been a center of politics, economy, science, information and arts of the country. Consequently, the City, attracting every human activity, has been urbanized at the outstandingly high rate to become one of the world biggest metropolises.

A.3.2 Land Use Conditions

a. General Structure of Land Use

The major land use of the country is grassland and/or pastures, accounting for 39% of the land area. The second largest is forest and other wooded land, 30%, followed by arable and permanent crop land, 13%. (OECD, *Environmental Performance Review*, p.38)

Land use of the DF can be roughly divided into two. The south half is an area which has high ecological value, corresponding to the delegations of Tlahuac, Milpa Alta, Xochimilco, Tlalpan, Magdalena Contreras, Cuajimalpa de Morelos and the south of Alvaro Obregon. The other half is an urbanized area where human habitations, commercial activities and offices are concentrated. Delegations of Cuauhtemoc, Benito Juarez, Iztacalco, Coyoacan and Iztapalapa are those particularly densely populated. Delegation of Gustavo A. Madero, located at the north end of the DF, is also highly populated, but also enjoys natural environment of the foot of Sierra de Guadalupe in its north.

In the DF, there are totally eight National Parks, six areas designated as ecology protection areas and one forest protection area. Their distribution, shown in Table A-17, agrees with what is stated above; the majority of those environmentally valuable areas are in the south of the city, especially in Magdalena Contreras where nearly half of the territory is rich in natural resources.

Table A-17: Surface Area of Nature Protection Areas by Delegation
(as of 31 December 1996)

	National Parks (ha)	Ecology Conservation Areas (ha)	Forest Protection Areas(ha)	Ratio of These to the Total Area of Each Territory (%)
Federal District	3,705.0	4,874.6	3,100.0	1.2
Coyoacán	432.0	-	-	7.5
Cuajimalpa de Morelos	1 865.0	-	-	24.6
Gustavo A. Madero	302.0	687.0	-	11.1
Iztapala	80.0	576.4	-	5.5
Magdalena Contreras	86.0	-	3,100.0	45.2
Tlalpan	940.0	727.0	-	5.5
Xochimilco	-	2,657.0	-	20.9
Miguel Hidalgo	-	227.2	-	4.8

Source: Secretary of the DDF; Committee of Natural Resources

b. Issues of Ejidos

Apart from the general outline of the land use described in the previous section, one must not overlook the issue of *ejidos* (communal land), where is the peculiarity of Mexico's land use.

The Revolution, which started in 1910, culminated to the very innovative Constitution of 1917. "Land for the Landless" movement, one of the driving forces of the Revolution, then resulted in the requisition of the large land estates for the federation. The Constitution vested the right to use such land with local communities. The land commonly owned is called *ejido* and the owners are *ejidatarios*. The conversion of the land use of *ejido* was strictly regulated by the federal laws and brought lengthy delay to the spatial city growth.

The amendment to the Constitution in 1992 gave the *ejidatarios* the right to privatize or sell the land at their discretion with an objective to facilitate the land use conversion. The land demarcation and property rights in *ejidos* are, however, still so vague that their effective utilization, with purposes of either urban development or natural resource management, is still often hindered.

Although there are limited *ejidos* within the DF itself, many of them can be seen in the outskirts of the metropolitan areas. It is necessary, therefore, to pay attention to the presence of *ejidos* and the uncertainties of their legal settings when urban development plans are to be considered.

A.3.3 Population Density

Using the 1990 Census and population data estimated for 1997, population density in the DF and in each delegation were calculated. The result is shown in Table A-18.

The DF's population in 1997 is estimated at 8,567,135 and its surface area is 150,552 ha, thus the population density comes to 56.90 person/ha. This is considerably high compared to the population density for the whole country, which is reported by PAHO to be 0.46 person/ha.

The number of delegations whose population density is higher than the DF average is 10 out of 16. The delegations of Iztacalco, Cuauhtemoc and Iztapalapa are the ones which are particularly densely populated.

Table A-18: Population Density in the DF by Delegation

Delegation	Area (ha)	1990		1997	
		Population (persons)	Population Density (persons/ha)	Population (persons)	Population Density (persons/ha)
Alvaro Obregon	8,586	642,753	74.86	688,923	80.24
Azcapotzalco	3,451	474,688	137.55	439,188	127.26
Benito Juarez	2,750	407,811	148.29	376,576	136.94
Coyoacan	5,540	640,066	115.54	703,086	126.91
Cuajimalpa	7,700	119,669	15.54	147,340	19.14
Cuauhtemoc	3,309	595,960	180.10	538,315	162.68
Gustavo A.Madero	8,700	1,268,068	145.75	1,214,625	139.61
Iztacalco	2,306	448,322	194.42	414,048	179.55
Iztapalapa	11,940	1,490,499	124.83	1,717,259	143.82
M.Contreras	7,004	195,041	27.85	221,463	31.62
Miguel Hidalgo	4,764	406,868	85.40	367,495	77.14
Milpa Alta	27,820	63,654	2.29	75,866	2.73
Tlahuac	9,300	206,700	22.23	264,349	28.42
Tlalpan	31,200	484,866	15.54	600,703	19.25
V.Carranza	3,442	519,628	150.97	471,241	136.91
Xochimilco	12,740	271,151	21.28	326,658	25.64
DF Total	150,552	8,235,744	54.70	8,567,135	56.90

A.3.4 Transportation

The transport of the DF heavily depends on its extensive road network to such an extent that it suffers from notorious air pollution.

There are two main ring road called Circuito Interior and Periferico. The former goes around the most urbanized area of the DF while the latter runs in the outer area some sections of which are in State of Mexico.

Principal road which runs from north to south is Insurgentes, which links Pachuca Hidalgo and Cuernavaca via Mexico City. Principal roads which run from east to west include Reforma, which leads to Toluca; Ermita Iztapalapa, to Puebla; Oceania and Via Tapoa to the east; and Mexico Tacuba, to Queretaro.

A number of axes roads (called *Ejes*) form a latticed road web throughout the urbanized city center (i.e., north part of the DF). Ejes Sur and Ejes Norte go in a latitudinal direction in the south and north halves of city center, respectively, while Ejes Poniente and Ejes Oriente are in a longitudinal direction in the west and east halves of city center, respectively. Then they are linked with secondary and tertiary roads extending to the suburban area. Roads in the south part of the DF are distributed sparsely, which indicates that the area is undeveloped and rich in natural environment.

Besides the road transport, the subways (or here called Metro) provide a great number of people with another essential means of travel within the city and between the city

and the State of Mexico. The use of the subways has been facilitated by the restriction of the use of vehicles in the city to improve air quality and the intention of the people not to be involved in the traffic congestion. Since the open of the first line in 1968, there have been developed nine lines and they are being further extended.

The other type of transport includes railways run by the National Railway (*Ferrocarriles Nacionales*). There is a central station in the Delegation Cuauhtemoc, but the railway is not used for daily activities but used only for long-distance travels.

A.4 Financial Conditions

A.4.1 Public Finance of DF Government²⁴

A.4.1.1 Budgetary Revenues and Expenditures of DF²⁵

While weakening financial base of the DF and state governments, in the remote area in particular, and subsequent unbalanced regional growth becoming a growing concern for the Federal government, economic management of the government of Federal District (DF) has been somewhat volatile to external factors, and internal tax fundamentals as well. The DF government budget coinciding with the calendar year comprises recurrent revenue and expenditure with no "development budget" being stipulated explicitly in the official documents. Current revenue sources for the DF government pertains to (i) own revenue and (ii) contribution from the Federal government, with the line items of the former including (a) Taxes (*Impuestos*), (b) Service Fees (*Derechos*), (c) Contribution not included from Federal Government (*Contribuciones no Comprendidas*), (d) Products (*Productos*), (e) Good Use (*Aprovechamientos*), (f) Debt Carry-Forwards from Previous Year (*ADEFAS*), and (g) Others (*Otros Ingresos*). The latter pertains to (a) contribution for improvements (*Contribuciones de Mejoras*), (b) auxiliary items of contribution (*Accesorios de las Contribuciones*), (c) federal tax revenue share (*Participaciones en Ingresos Federales*), and (d) share due to coordination activities (*Participaciones por Actos de Coordinación*). Of the funds transferred from the Federal government, tax revenue shares (*participaciones*) transferred from the Federal government constitutes the major source of income for DF government and other local (state and municipality) governments as well.

²⁴ With a paucity of reliable and consistent data and numerical information timely available, it makes most likely that the issue of public finance in Mexico is limited to the budgets of the Federal government and public entities (PEs) included in the Fed budget. These PEs included in the Fed budget or under budgetary control pertain to Petróleos Mexicano (PEMEX), Comisión Federal de Electricidad (CFE), Luz y Fuerza del Centro, Ferrocarriles Nacionales de México (FNM), Compañía Nacional de Subsistencias Populares (CONASUPO), Productora e Importadora de Papel (PIPSA), Aeropuertos y Servicio Auxiliares (ASA), Caminos y Puentes Federales de Ingresos y Servicios Conexos (CAPUFE), Lotería Nacional para la Asistencia Pública, Instituto Mexicano del Seguro Social (IMSS), and Instituto de Seguridad y Servicios Sociales de los Trabajadores del Estado (ISSSTE).

²⁵ References: *Gaceta Oficial del Departamento del Distrito Federal*, December 1994-1998, National Statistics, Geography and Informatic Institute (INEGI), *El Ingreso y El Gasto Público en México*, 1997, DF, *XIV Censo Industrial*, *XI Censo Comercial* y *XI Censo de Servicios*, 1995, *Finanzas Públicas Estatales y Municipales de México 1990-1995*, 1997, *Sistema de Cuentas Nacionales de México*, DF, *Clasificador por Objeto del Gasto*, 1995, *HACIENDA, Informes Sobre la Situación Económica, las Finanzas Públicas y la Deuda Pública*, first quarter 1998, *Cuaderno Estadístico Básico de las Finanzas Públicas del Distrito Federal*, 1997, *Cuenta Pública del DF*, 1995-1997, *Presupuesto Autorizado para DF*, 1995-1997

One of the salient features of the budgetary processes at DF is its treatment of carry forwards over fiscal years. The budget deficit at the end of fiscal year is to be carried forward as an opening balance for the following year, and be subject to the assessment by the Secretariat of Finance at DF if the deficit be complemented by new money in March or April. In the fiscal years of 1997 and 1998, budget deficits carried over from the preceding years were P.500 million and P. 600 million, accounting for 1.6 percent and 1.5 percent of the total budget, respectively²⁶. On the other side, budget surplus or unutilized budget is not to be carried forward to the next fiscal year. In the normal fiscal practice, budget adjustment would take place in prior to the last quarter of the year, while considering realignment of budget inclusive of reallocation among and/or cancellation of projects. Any adjustment of budget would not take place after October or November in the year.²⁷

Inclusive of all sources of funds as noted above, gross revenue of DF for the fiscal year 1998 is set at P. 38,712 million arising from respective of P. 31,105 million, P. 25,097 million, and P. 18,153 million in 1997, 1996, and 1995, with the average annual growth rate of 28.7 percent in nominal term.²⁸ The share of own revenue has slightly been downsizing over the same period from 60.3 percent in 1995 to 55.4 percent in 1998. Amongst the sources of own revenue of DF, Taxes dominates with 21.0 percent of the gross revenue, followed by Others, Products, Service Charges, Debt from Previous Year, Good Use, and Contribution not Included with 13.2 percent, 9.2 percent, and 9.1 percent, 1.5 percent, 1.4 percent, and 0.0 percent respectively. Tax revenue sharing transferred from the Federal government accounts for 34.9 percent in 1998 and has been somewhat declined from the highest 42.2 percent share in gross revenue in 1996. The balance amongst the transfer items is shared by Share due to Coordination, Auxiliaries, and Contribution for Improvements accounting for 7.7 percent, 1.6 percent, and 0.4 percent, in that order.

Overall expenditure of DF comprises three parts, vis-à-vis, expenditures of DF government, transfer expenditures to Delegations, and expenditures for semi-state entities. In 1998 gross fiscal expenditure was P.42,574 million of which DF government, Semi-state Entities, and Delegation accounted for 60.6 percent, 23.9 percent, and the balance 15.6 percent, while arising from P.33,566 million, P. 27,664 million, and P.19,865 million in respective of 1997, 1996, and 1995. As regards the expenditure attributed solely to the DF government, it grew annually 28.9 percent in nominal terms with P.17,682 million in 1995 to P.25,784 million in 1998. Budget deficit of DF of P. 3,862 million, or around respective of 0.47 percent and 0.1 percent of GRP and GDP in 1997, was financed by public borrowings (deuda publica), as detailed in the ensuing sub-section.

In the meantime, the financial position of local governments is, as previously noted, weak on account of volatile tax base and the central government regulations that constrain self-efforts to raise funds through financial markets. DF and other local governments manage the economy to date, the current financial position confined government activities to a limited extent. Government intervention in market

²⁶ Source: *Gaceta Oficial del departamento del Distrito Federal, December 1996, 1997*

²⁷ Hearty thanks are due to Lic. Rosalba Cruz Jimenez for her precious and the most relevant information on the issue.

²⁸ DF revenue in real term is declining while considering the high level of inflation during and post-Peso crisis period of 1995-1998.

economy, as measured by the share of public consumption out of aggregate demand, remained very low with 1.0 percent in 1997 and 6.0 percent in 1995 for DF and all the state governments, respectively²⁹.

It would also be noteworthy that in relation to population and budgetary revenue at the central level, where population in DF was 9.3 percent of the total population with 24.1 percent of the aggregate supply of the country, respectively in 1997, 6.2 percent equivalent of DF government revenue to the Federal government in the same year³⁰ seems to be obviously lower than those proportional figures. The size of the budget expenditure of DF in terms of that of the Federal government seems also extremely low with the ratios of 5.7 percent and 5.0 percent with regard to gross expenditures and programmable expenditures³¹, respectively. With this in view, it would be considered reasonable that the effort to higher revenue generating capacity of the local authority be further encouraged to meet pressing challenges in socioeconomic development of the region. Number of employees at DGSU was 436 in 1997 (*Cuenta Publica del DF 1997*, p.202). Change in financial position at DF government during the recent four years of 1995 through 1998 is summarized and given below as Table A-19. Further, a table of revenues and expenditures at each level of the governments at the central and subordinates, with the budget allocation for SWM, is attached as Table A-20.

Table A-19: Change in Financial Position of DF Government, 1995-1998

	1995	1996	1997	1998	(P. million) Annual Nominal Increase(%)
Revenue	18,153.6	25,097.3	31,105.4	38,712.0	28.7
Of which Own Revenue	10,944.7	13,980.6	17,060.1	21,464.6	25.2
Expenditure	19,386.3	27,664.2	33,566.6	42,574.4	29.9
Debt Service	221.9	1,599.4	1,860.4	2,609.4	127.7

Source: Gaceta Oficial del Distrito Federal, 1994-1997, Cuenta Pública del DF 1998

Table A-20: Public Revenues, Expenditures and Budget Allocation for SWM, 1995-1998

	1995	1996	1997	1998	(P. million)
I. Revenue					
1. Federal Government	283,195	392,600	503,300		
2. DF Government	18,153	25,097	31,105	38,712	
Of which Own Revenue	10,944	13,980	17,060	21,464	
II. Expenditures					
1. Federal Government *1	293,800	580,700	730,400		
2. DF Government (Aggregate)	19,865	27,664	33,566	42,574	

²⁹ Sources: Banco de Mexico, *op cit*, p.249, INEGI, *op cit.*, p.29

³⁰ Excluding the budgetary revenues of P.227.2 million from public enterprises and entities (PEMEX and others) from gross budgetary revenue of the Federal government that stands at P.730.4 million, or 23.0 percent of GDP in 1997. Provided that the gross revenue of the federal government be applied as a denominator, the fraction of DF government revenue against the Federal government downsizes drastically to a little more than one over 25, or 4.3 percent equivalent. (Source: Banco de Mexico, *The Mexican Economy 1998*, 1998, p.281)

³¹ As regards DF expenditure, expenditures for DF administrative bodies, or P. 25,784 million in 1998, has been taken into account.

	1995	1996	1997	1998
Of which Gasto de Capitol (%) ^{*2}	31.2	35.9		
3. Of which Debt Service	222	1,599	1,860	1,908
4. Secretariat of Works and Services	3,693	5,967	6,888	8,890
5. DGSU ^{*3}	787	1,220	1,051	
6. Delegations ^{*4}	3,529	4,795	6,102	6,629
III. SWM Budget Allocation				
1. SEDESOL	-	-	-	70.0
2. Local (DGSU+Delegations)	950.2	1,092.9	1,481.9	1,560.4
3. DF-DGSU ^{*5}			742.1	987.9
3.1 Administration			641.2	935.3
3.2 Development			100.9	52.6
Development Budget Share (%)			13.5	5.3
4. Delegations			739.8	572.5
4.1 Administration			667.1	557.2
4.2 Development			72.7	15.3

- *1 Source: IMF, *IFS* for 1995 and Banco de México, *Mexican Economy 1998* for 1996-1997
 *2 Source: *Cuenta Pública del DF* de los años 1990-1996
 *3 Source: *Cuenta Pública del DF 1996*, tomo I p.101
 *4 Source: *Cuaderno Estadístico Básico de las Finanzas Públicas del Distrito Federal, 1997*,
 *5 Source: *Estrategia Programática Sectorial 1996* for 1996, DGSU data for 1997-1998.

A.4.1.2 Public Debt of DF Government

Further concern over the District's sound management of public finance would be its external borrowing and associated financial obligation to cover the debt services. Volatility in sector growth would depend on this factor outside the control of the DF government and would place greater pressure on its financial maneuverability in the years to come.

As of the end of fiscal year 1997, the aggregate amount of external debt of DF government was P.11,786 million which was equivalent to around 0.36 percent of GDP. In a bid to round out the fiscal gap in 1998, the Congress of the Union authorized DF, as per the Article No.2 of the Income Law for the Federation and the Income Law for the District of Federal (DF), to exercise a net borrowing of P. 7.5 billion at maximum.³² With this, the consolidated debt has since the end of 1997 grew by 1.97 percent reaching to a total figure of P.12,019.9 million, or would be 0.35 percent of GDP³³. Of this, borrowings for DF administrative bodies and semi-state entities account for 77.3 percent and the remaining 22.7 percent, respectively. Difference in aggregate debt over the two period in time is made in line with the new borrowing of P. 317 million and amortization of P. 83.8 million, with the net borrowing of P. 233.2 million.

³² Reference: Instituto Nacional de Estadística, Geografía, e Informática (INEGI), Report on the status of public debt of the Federal District government is to be submitted to the Congress of the Union three times a year in compliance with what is set forth in article No. 73 sections VIII and 122, Letter C of the second base, and Letter F of the Constitution of the United Mexican States; in article 67, section XV of the Statute of the Government of District of Federal; in article 23 of the General Law on Public Debts of the DF Government. Also, SHCP has a judicial obligation to submit a report, inter alia, *Informes sobre la Situación Económica, las Finanzas Públicas y la Deuda Pública*, to Congress for review on the evolution of the economy, public finance and public debts that contains statistics regarding income and expenditures taken place over the quarter within 45 days after the end of a quarter. Annual report of public account (*Cuenta de la Hacienda Pública Federal*) is also due for review by Congress.

³³ Assuming 5 percent of GDP growth in 1998 in nominal terms.

A.4.1.3 Debt Service Ratio

Financial healthiness of entities is a function of an expense accrued each year but also the share of debt services out of the funds generated in a year. Viewed in this light, debt service ratio (*DSR*) is highlighted as a proxy index to represent soundness in financial management. Numerically defined, *DSR* is as follows.

$$DSR_t = \frac{(\text{Annual Debt Service})}{\text{Revenue}}$$

$$DSR_t = \frac{(\text{Annual Debt Service})}{\text{Own Revenue}} \quad \text{where } t \text{ denotes any year during the project period.}$$

With P. 2,609.4 million of debt service authorized by Congress for the year 1998³⁴, *DSR* in terms of the whole revenue and own revenue worked out 6.7 percent and 12.2 percent, respectively. Of the authorized debt service, P. 1,907.9 million³⁵, equivalent to 73.1 percent of the aggregate, is set forth to meet interest payments in the year.

Over the first quarter period of time in 1998, the total debt service borne out by DF government was P. 507.5 million, with amortization and interest payment of P. 83.8 million and P. 423.7 million respectively. This accounts for 83.9 percent and 19.4 percent of the programmed amount for the first trimester and the authorized for the year 1998.

Of the sources of funds for development projects as retained within DF, the largest chunk emanates from the transportation sector, in connection mainly with the Line B of Metro and auxiliaries, with 61.1 percent, followed by the hydraulic system, public works and services, environmental improvement, economic development, and technological upgrading of the Attorney General's Office while each of which accounting for 30.5 percent, 3.7 percent, 2.3 percent, 1.2 percent, and 1.2 percent. As regards the hydraulic system, the resources will be channeled, among others, for the commencement of the Cleansing Program for the Mexico Valley, replacement of wells, parametrical aqueducts, the construction of collectors, deep drainage, and hydraulic strengthening.

In the meantime, most of states had since the end of the 1980s expanded their current and capital expenditures while enjoying access to domestic financing by the banking system, thus leading to an increased fiscal deficits of P.30,904 million in aggregate, or about 1.7 percent of GDP in 1995³⁶. These deficits have been reflected in the growth of outstanding debts, which has increased by about 84.7 percent in nominal terms during the first half of the 90's (1991-1995). While States and municipalities do not have the authority to issue securities in the domestic capital market, the federal government is only the one being entitled to borrow abroad. State debt instruments are generally issued through national development banks.³⁷

Consolidated Balance of Public Debt as of March 31, 1998, and debt service as of 31 March 1998 are given in Table A-21 and Table A-22, herewith.

³⁴ Source: HACIENDA, *Informes sobre la Situación Económica, las Finanzas Pública y Deuda Pública, Acciones y Resultados del Primer Trimestre de 1998*, May 1998

³⁵ Source: Cuenta Pública del DF 1998

³⁶ Source: INEGI, *Finanzas Públicas Estatales y Municipales de México 1991-1995*, 1997, p. 29

³⁷ Reference: Teresa Ter-Minassian (ed), *Fiscal Federalism in Theory and Practice*, IMF, 1997, p.591

Table A-21: Consolidated Balance of Public Debt as of March 31, 1998

(P. million)

CONCEPT	Balance 31 Dec 1997	Positions	Amortization	Net borrowing	Balance 31 March 1998
TOTAL DEBT	11,786.7	317.0	83.8	233.2	12,019.9
CENTRAL SECTOR	9,133.6	230.3	78.2	152.1	9,285.7
BANOBRAS - French protocol	407.9		20.9	-20.9	387.0
BANOBRAS - BIRF 2824 - ME	8.6				8.6
BANOBRAS - IDB	122.2				122.2
BANOBRAS - OECF	336.7	24.6		24.6	361.3
BANOBRAS - BCH - CAF	747.6		44.0	-44.0	703.6
BANOBRAS - LINE "B" 8027	439.3				439.3
BANOBRAS - Public investments	73.0				73.0
BANOBRAS - UDI 8028 re-structuring	470.0				470.0
BANOBRAS - UDI 8032 re-structuring	470.0				470.0
BANOBRAS - UDI 8030 re-structuring	371.7				371.7
BANOBRAS - UDI 8031 re-structuring	464.8		13.3	-13.3	451.5
BANOBRAS - UDI 8037 re-structuring	500.1				500.1
BANCO BILBAO VIZCAYA	530.0				530.0
BANCOMER - Public safety	606.4				606.4
BANCOMER - ATT. GRAL.'S JUSTICE OFF.	602.1				602.1
BANCOMER - Water metering program	421.5				421.5
BANCA PROMEX	249.0				249.0
BANCA IXE	199.4				199.4
BANCOMER - Public investments	1,724.5				1,724.5
BANOBRAS-Line "B" civil & electromech. Works	332.0	205.7		205.7	537.7
BANOBRAS - Cleansing Program	1.0				1.0
NACIONAL FINANCIERA - Eximbank	32.0				32.0
NACIONAL FINANCIERA - BIRF	23.8				23.8
COORDINATED BODIES	2,653.1	86.7	5.6	81.1	2,734.2
Public Transportation System	1,885.2	50.7	5.6	45.1	1,930.3
Electric Transportation Service	66.4	36.0		36.0	102.4
Passengers' Urban Car Transportation System	701.5				701.5

Source: Report of the Government of the Federal District.

Table A-22: Consolidated Public Debt Service as of March 31, 1998

(P. million)

Concept	Authorized	Programmed for March	March so far
Central sector	1,893.0	487.3	459.3
Amortization	393.0	90.0	78.2
Interests, commissions and expenses	1,500.0	397.3	381.1
Bodies and enterprises	716.4	116.9	48.2
Amortization	308.5	16.6	5.6
Interests, commissions and expenses	407.9	100.3	42.6
TOTAL	2,609.4	604.2	507.5

Source: Report of the Government of the Federal District.