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CONCLUSIONS AND RECOMMENDATIONS*

Despite the 1994-95 peso crisis and a sharp economic slowdown in 2001, Mexico's GDP grew by 41% overall between 1990 and 2001 while its *population increased by 22%* (the highest rate among OECD countries) to reach over 100 million today. The Mexican economy is the eighth largest in the OECD and the largest in Latin America, though GDP per capita is among the lowest in the OECD area. These national data mask the existence of *dual consumption and production patterns* and the persistence of regional disparities. Income inequality in Mexico is among the greatest in the OECD area. *Poverty* remains widespread, affecting 53 million people in urban and rural areas, including in particular the indigenous population. Particularly since 1994 (conclusion of the North American Free Trade Agreement and accession to the OECD), Mexico has pursued a policy aimed at *opening up its economy* and integrating it with world markets. Mexico is Latin America's most important exporting country by far; it has extensive oil and natural gas reserves and a wealth of other mineral resources, while its industrial sector is competitive in many fields. With 1.3% of world land area, Mexico hosts about 12% of known terrestrial biota and is one of the world's 12 *megadiverse countries*.

Strong *decoupling* of environmental pressure from GDP, as seen in a number of OECD countries, has not yet been achieved in Mexico. Indeed, recovery from the currency crisis and overall subsequent rapid economic growth have occurred together with increased pressures on the environment, including through pollution and natural resource use, despite the establishment of a solid environmental legal and institutional framework. Further, Mexico has adopted an ambitious approach to environmental governance, increasingly mainstreaming sustainable development as a guiding principle of sectoral policy-making processes

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and as a shared responsibility of different sectors and institutions. Today, *priority environmental issues* include: water and forest management, which have become issues of national security; integrated management of natural resources; environmental management and environmental planning at the watershed level; decentralisation of environmental management and decision-making; increased public participation and the right of access to environmental information; ensuring that users of natural resources pay for the environmental cost of resource use; and, strengthening of environmental legislation, inspection and compliance rates. Several of these issues reflect pressures on the environment deriving from Mexico's development choices and demography, as some 1.5 million new citizens per year increase the challenges of providing basic environmental services.

To meet these challenges, it will be necessary for Mexico to: i) thoroughly implement its environmental policies, improving cost-effectiveness and financing to extend environmental infrastructure; ii) further integrate environmental concerns into economic and social decisions; and iii) meet its international environmental commitments. This report examines progress made by Mexico *since the previous OECD Environmental Performance Review* in 1998, and the extent to which the country's *domestic objectives and international commitments* are being met. It also reviews progress in the context of the *OECD Environmental Strategy*.^{*} Some 61 recommendations are made that could help strengthen Mexico's environmental progress in the context of sustainable development.

1. Environmental Management

Implementing environmental policies and developing the environmental infrastructure

Environmental legislation progressed during the review period. The General Law on Ecological Balance and Environmental Protection (covering air, sea and fresh water quality, hazardous waste, soil, protected areas, environmental impact assessment and noise) was updated in 1996 to introduce *integrated pollution control* for air, water and waste (introducing a Single Environmental License) and, in 2001, to establish the right of *public access to environmental information* and to strengthen public participation. New general laws were recently enacted

* The objectives of the "OECD Environmental Strategy for the First Decade of the 21st Century" are covered in the following sections of these Conclusions and Recommendations: maintaining the integrity of ecosystems (Section 1), decoupling of environmental pressures from economic growth (Sections 2.1 and 2.3), integration of social and environmental concerns (Section 2.2) and global environmental interdependence (Section 3).

on wildlife protection (2000) and on waste management (2003). In addition, all states have created their own environmental legal regimes. An increasing number of environmental offences are considered in the criminal code, and penal sanctions have been taken (e.g. for arson in forests). *Emission standards* are now linked to environmental quality objectives for recipient bodies. *Voluntary industry audits* have led to the granting of clean industry certificates. *User charges for Federal marine reserves* have recently been introduced and will be extended to terrestrial protected natural areas. Efforts are being made to develop public-private partnerships in the water sector.

However, though Mexico has recognised the severe environmental degradation confronting it, time as well as sustained and continuous efforts will be required to implement and fund its environmental policies. Devolution of environmental policy implementation has not been accompanied by adequate capacity building at state

It is *recommended* to:

- improve *enforcement of environmental legislation*, especially for nature and forest protection, by enhancing the human and financial capacity of PROFEPA and fostering partnerships with police authorities; review water related enforcement and compliance and include waste water discharge in integrated pollution control licences;
- extend the application of the *user and polluter pays principles* through better pricing of water and waste services, with due regard to social constraints;
- review the scope for introducing *new economic instruments* such as product charges on hazardous waste streams, air emission charges, payments for environmental services and water pollution charges;
- expand *environmental infrastructure*; in particular, increase related spending (e.g. from public, private and international sources), improve efficiency in the provision of environmental services, and develop public-private partnerships in the water and waste sectors;
- accompany decentralisation of environmental management to states and municipalities through commensurate *devolution of powers to tax and charge for environmental services* and determined efforts to build local administrative and technical capacity;
- formalise *institutional integration* mechanisms relating to sustainable development; further integrate environmental concerns into economic, fiscal and sectoral policies (e.g. transport, energy, agriculture, tourism).

and municipal levels. This *implementation gap* reflects, in particular, the complex and sometimes unclear distribution of environmental competency across levels of government and limited local authority to raise revenues from taxes or charges. The scope of *environmental enforcement* has been broadened to address unsustainable use of natural resources (e.g. illegal forest cutting) but without the necessary parallel increases in staff and budget of the Federal Attorney for Environmental Protection (PROFEPA). Irrigation Districts continue to be inspected separately by the National Water Commission (which both inspects and enforces its own irrigation schemes), while individual irrigation schemes (50% of irrigation water) are virtually uninspected. There is wide scope to extend the use of *economic instruments*, particularly in air and waste management. User charges for water and waste water services are set below cost recovery levels. Farmers are exempt from water abstraction charges. *Pollution abatement and control expenditure* has remained low by OECD standards. In fact, there are very large needs with respect to environmental infrastructure (e.g. water supply, waste water collection and treatment, waste infrastructure) which reflect cumulated underinvestment in such infrastructure and rapid population increase in urban areas. Given Mexico's environmental objectives, there is a *financing gap*: insufficient Federal spending on environmental protection, limited application of the user and polluter pays principles, the limited revenue-raising ability of states and municipalities and low reliance on external financing all explain Mexico's difficulties.

Air

Air pollution has significantly declined overall in urban areas during the last ten years, including in the megacity of Mexico. CO, SO₂ and lead concentrations have decreased in many Mexican cities. There is evidence of a reduction of acute respiratory diseases in children under five. Mexico has switched from fuel oil to natural gas for part of its electricity production; the share of *natural gas* in total primary energy supply increased to 21% while oil's share fell to 62%. Seven large metropolitan areas have adopted local *air quality management programmes* that address pollution by the industry, service and transport sectors as well as environmental recovery. *Fuel quality improvements* have been the cornerstone of these programmes. Reducing the lead and sulphur content of motor vehicle fuels contributed to the reduction of some emissions from mobile sources. A regional surcharge was applied to petrol in order to finance environmental improvement measures in the Valley of Mexico Metropolitan Area (ZMVM) and to internalise environmental externalities. Further, several Official Mexican *Standards* have been issued concerning emissions from mobile and fixed sources, and more stringent *limit values* have been introduced for *vehicle emissions* of CO, NO_x

and hydrocarbons. Vehicles with catalytic converters replaced after five years of operation, clean companies, and facilities using natural gas have been exempted from air quality emergency plans due to a recent regulation. The number of firms voluntarily carrying out eco-audits has consistently increased. Significant progress has been made with implementation of the OECD recommendation on the Pollutant Release and Transfer Register.

However, *exposure to air pollution remains a severe threat to public health*. Extremely high pollution episodes have become rare, but the number of days on which air quality standards are exceeded has remained unchanged. *Suspended particles and photochemical ozone* are of particular concern. Ambient air quality standards for PM₁₀ are exceeded up to 30% of the year in all metropolitan areas. The goal of reducing national NO_x emissions by 40% by 2000 was not achieved.

It is *recommended* to:

- continue to strengthen *implementation and enforcement* of the regulatory system;
- extend air emissions regulation to additional *industrial branches* and update existing regulations for SMEs; improve compliance rates, particularly for the most polluting firms;
- better enforce *vehicle inspection*, make it mandatory in the most polluted cities and extend it to buses and lorries; speed up *renewal of the vehicle fleet*; further develop and implement *traffic management* in urban areas, giving appropriate priority to public transport;
- strengthen integration of air quality concerns in the industry, transport and energy sectors through use of *economic instruments* as well as elimination of subsidies with harmful environmental effects;
- continue efforts to improve *fuel quality*; in particular, reduce the sulphur content of diesel and petrol, internalise externalities in fuel prices; proceed with appropriate investment to reduce emissions and to prevent accidents in the energy sector (e.g. in refineries, power plants);
- give higher priority to pollutants with significant impacts on *human health*; in particular extend air quality monitoring to include PM_{2.5} and VOCs;
- further develop the air management capacity of *states and municipalities*; extend *air emission estimates* to the whole country, including to all cities with over 500 000 inhabitants and to energy and industrial facilities; strengthen criteria in air quality emergency plans and extend such plans to the most polluted cities.

An integrated, long-term approach is required to reduce ozone concentrations to safe levels in the ZMVM. Relatively high levels of emissions from the transport, industry and energy sectors remain a challenge. *Transport* is growing rapidly: the number and use of private vehicles, as well as freight transport, are increasing partly as a result of NAFTA. This “volume effect” has offset the benefits of improved fuels, vehicle standards and traffic management measures. Implementation and enforcement of vehicle inspection programmes is to be strengthened for both cars and commercial vehicles (e.g. buses and lorries). Conversion of high-use vehicles (such as taxis) to compressed natural gas might be usefully revisited. Regulation of *industrial emissions* from specific branches requires updating (e.g. for SMEs) and several branches are still unregulated. Three-quarters of firms inspected in 1998-2002 were not in compliance with air emission standards. Concerning the *energy sector*, the national oil company (PEMEX) has already made important investments and half its facilities are working towards obtaining clean industry certificates; however, it still needs to invest massively to control air pollution (e.g. in its refineries) and to prevent accidents at production facilities. The energy sector reform has not been engaged. The potential for using economic instruments and reducing economic distortions with negative environmental consequences (e.g. due to subsidies) remains to be further explored in the transport industry and energy sectors.

Water

Mexico made substantial progress towards the targets it set itself in the 1995-2000 National Water Plan. Targets for providing access to *water supply, sanitation services and waste water treatment* were largely met in urban areas, though performance fell somewhat short of targets in rural areas. Over 95% of drinking water supplied is now disinfected, with a consequent dramatic decrease in the number of cases of gastro-intestinal disease and the disappearance of cholera. There has been progress towards *decentralisation* of water management: several National Water Commission programmes are now administered at state level; state water laws have been passed in many but not yet all states, and state water commissions have been created. About 25 *river basin councils* are now operating. Administration of *irrigation districts* has been transferred to user associations, which have management and financial responsibility for operating and maintaining their irrigation systems. Water abstraction rights and permits for waste water discharge have been recorded in a Public Register available on Internet. Mexico has greatly improved its water information systems; large amounts of water data and documentation are available. Stakeholder participation in water management is actively promoted.

Use of water resources nonetheless remains *unsustainable*. *Investment in water infrastructure*, already low by OECD standards, fell in real terms during the 1990s. It currently stands at about *half of the investment that would be required* to achieve a sustainable scenario by 2025. Little over one-quarter of urban waste water is treated. Few waste water utilities met the 2000 deadline for effluent limits (set in a 1996 standard); the rest were subject to large fines. Some treatment stations are not operating due to lack of funds. Industrial discharges are largely untreated. The operational standard at treatment stations is often well below design specifications. Water utilities find it difficult to make customers pay their water bills, with the result that their income is too low to maintain good service. *Enforcement* also suffers from inadequate resourcing, and standards are not well respected. *Water losses* from irrigation and drinking water supply systems, despite recent improvements, remain high. The degree of *over-exploitation of groundwater* resources is increasing. Ecological aspects of water quality have so far been given too little consideration.

It is *recommended* to:

- increase current water-related *investments* and management efforts, in order to meet Mexico's 2025 long-term objectives and the 2015 Johannesburg targets for water supply and sanitation, with due regard to the rural population;
- pursue current proposals to increase *compliance* by local utilities and industry with the effluent limits and deadlines of 1996 standard;
- encourage drinking water and waste water facilities to obtain ISO accreditation to improve the *operational performance* of treatment plants;
- continue efforts to improve the *water efficiency of agricultural irrigation*, particularly groundwater-fed irrigation; take measures to halt overexploitation of groundwater aquifers;
- further develop demand management measures that encourage *sustainable water use* and further progress in the transition towards pricing of water services, whilst giving attention to the special needs of the poor;
- strengthen and further develop an *integrated watershed approach* to both improve water and forest resources management and provide environment-related services more efficiently;
- reinforce current policies for *awareness raising* on water quality and for fostering stakeholder participation in water basin management;
- give greater weight in water management to the protection of *aquatic ecosystems* (e.g. rivers, lakes, estuaries, deltas, wetlands).

Waste

Significant efforts have been made to improve *hazardous waste management* in Mexico. Treatment and disposal capacity is increasing steadily and rapidly, with proper waste management capacity reaching 50% of hazardous waste generation and 100% of biological and infectious waste generation. A system to monitor hazardous waste generation, treatment and disposal has been established and its coverage is expanding. The inter-ministerial framework for managing use of toxic chemicals has been active, and efforts to promote substitution of non-hazardous for hazardous substances have been strengthened. Work to identify *contaminated sites* has begun, with these sites being prioritised according to the urgency for remediation. Remediation has been initiated at two sites.

In contrast, *municipal waste management* is at an early stage. Framework legislation has recently been approved but it remains to be implemented. Proper disposal capacity is so inadequate that over half of municipal waste is sent to uncontrolled and illegal landfills. Local governments do not have the capacity

It is *recommended* to:

- *enforce waste regulations* and reduce *illegal disposal* of hazardous and municipal waste, at national and local government levels;
- continue to enhance *hazardous waste management*, and to improve monitoring of hazardous waste generation, by working towards the completion target for the national registry (100% coverage by 2006);
- implement the newly adopted framework legislation for *municipal waste management*; increase the waste management capacity of municipal authorities and operating enterprises;
- develop a national strategy and local programmes to reduce urban and hazardous waste generation;
- increase *investment in infrastructure* (e.g. new sanitary landfills, closure of illegal landfills) for municipal waste management and extend services to medium and small cities;
- improve and modernise *recycling and reuse of municipal waste*, introducing producer responsibility for selected waste streams and taking social factors into account (e.g. the role of the informal sector); increase *composting of organic waste*;
- speed up identification of *contaminated sites*; develop and implement a national remediation strategy.

for proper waste management. Most households do not pay for waste collection. While a deposit-refund scheme was recently proposed for plastic bottles, there is still little use of economic instruments. Though part of municipal waste is recycled in the informal sector, recycling rates in Mexico are among the lowest in any OECD country. Little has been done to address waste streams of concern (e.g. tyres, used oil, plastic packaging).

Nature and biodiversity

As a megadiverse country, Mexico hosts approximately 12% of the world's total biodiversity. It is a world centre of origin and domestication of food germ plasm. Mexico now has a *complete legal and institutional framework* with which to tackle challenges relating to conservation and sustainable use of biodiversity. It has adopted a model National Biodiversity Strategy and is taking steps to define and implement a National Biodiversity Action Plan. Biodiversity and natural resource policies since the 1990s have aimed at changing production activities with adverse environmental impacts and using biological resources in a sustainable way. *Designated protected areas* increased substantially during the review period. This was accompanied by the establishment of the National Commission for Protected Natural Areas and the National System of Protected Natural Areas, adoption of a number of management plans, and increased funding from public, private and international sources. The National Forestry Commission was created in 2001 to implement the National Forest Strategy, whose objectives are to reduce rural poverty, increase the share of forestry in GDP and reduce deforestation by 75% over the period 2001-25. This led to a 15-fold increase of Mexico's budget for forest management and to enactment in 2003 of a new law for sustainable forest management. Concerning species, some progress was made with conservation and recovery projects for several priority species and the System of Units for the Conservation, Management and Sustainable Use of Wildlife, which covers over one-third of the national territory. The introduction of *incentives for conservation* and sustainable use of biodiversity (e.g. charges at marine national parks, proposed payments for environmental services to forest communities implementing biodiversity conservation initiatives) is a positive step.

However, *important problems requiring solutions can still be identified*. Mexico's biological wealth is *seriously threatened* and is undervalued as a primary factor in socio-economic development. Biodiversity loss and issues have been associated with the pressures created by inadequate earlier development policies: conversion of natural habitats to unsustainable agricultural schemes, deforestation in temperate and tropical forests, overgrazing of arid zone vegetation,

It is *recommended* to:

- integrate *biodiversity* concerns into the planning, execution and evaluation of public policies (e.g. agriculture, forestry, tourism, rural development), in line with the National Biodiversity Strategy and National Biodiversity Action Plan;
- significantly increase *financial resources* (from public, private and international sources) for biodiversity conservation at national, state and local levels, including through user charges;
- further develop the National System of *Protected Natural Areas*: extending its geographical and ecological coverage; providing resources to develop and implement management plans; promoting the establishment of biological corridors; and stimulating participation by private initiatives, as well as indigenous and local communities, in their conservation;
- foster recovery of *endangered species* populations, protecting their natural habitats and reducing illegal trafficking in wild species;
- support conservation and management of terrestrial and aquatic ecosystems *outside protected natural areas*; expand *ecological land planning*;
- combat *deforestation*, particularly for tropical woods and forests: strengthening reforestation programmes; promoting sustainable forest management; encouraging forest certification; and redirecting agricultural subsidies in forest areas to finance public ecological assets;
- consolidate *information systems* on Mexico's biological diversity and introduce *monitoring and evaluation* of biodiversity related policies and actions;
- Promote new laws to regulate the access to and sustainable use of *genetic resources*, consistent with international trade and multilateral environmental agreements.

illegal trade in threatened species, conservation conflicts in protected areas, lack of integrated coastal zone management programmes, risks of genetic contamination. The *deforestation* rate is still extremely high (among the highest in the world). Despite progress in managing protected areas, these areas account for under 10% of the territory and some types of ecosystems are under-represented; human, material and financial resources are still insufficient, leaving a sizeable number of protected areas without management plans. In the last few years the number of endangered *animal and plant species* has increased. There is a lack of specific legislation regulating access to and sustainable use of genetic resources.

2. Towards Sustainable Development

Integration of environmental concerns in economic decisions

Attaining sustainable development has become increasingly an explicit aim of the strategic National Development Plan (issued by the Office of the President and covering six year periods, based on a 25-year outlook). This plan provides the framework for the programming of much Federal public expenditure by sectors. *Environmental programming* is co-ordinated with other sectoral programming. The National Environmental and Natural Resources Programme is issued every six years. The Programme to Promote Sustainable Development in the Federal Government seeks to include sustainable development targets and action plans in sectoral planning. “Presidential” targets have been set for all ministries, including performance requirements in terms of environmental outcomes and public administration. Two national crusades have been launched, to raise public awareness of tropical deforestation and water resources and of waste management. Since 2001, the Ministry of Environment and Natural Resources (SEMARNAT), which oversees air, water and waste management as well as nature conservation and forestry, has participated in inter-ministerial economic, social and law and order meetings. There is *institutional integration* of environmental concerns within tourism policies (e.g. national eco-tourism programme, Agenda 21 for the tourism sector) and within energy policies (resulting in lower energy intensity and weak decoupling of total final energy consumption from economic growth, fuel switching from oil to natural gas, improvement of road fuel quality). Prices of *road fuel* have steadily increased. A petrol surcharge was levied in Mexico City’s metropolitan area to raise revenue for environmental activities; it has been discontinued.

However, Mexico has not achieved strong *decoupling* of environmental pressure from economic growth as has been done in some other OECD countries. This reflects its development choices as well as rapid population growth. Major sources of direct *environmental pressure* include road traffic, industrial and agricultural production, and energy production and consumption. Road freight traffic increased by 78% between 1990 and 2001, while industrial production, agricultural outputs and primary energy supply rose by 43%, 33% and 24%, respectively. *Market-based integration* has remained very limited. There have been many proposals to improve energy pricing and transport taxation, but few have been put into practice. Excise duty on fuels, designed to protect public revenue and consumer prices from fluctuations in world oil prices, and taxes on vehicles could be further differentiated according to environmental externalities. No

It is *recommended* to:

- fully take into account environmental concerns should *fiscal reform* be completed; there is a strong need for an increase in revenues to invest in environmental infrastructure;
- improve the environmental effectiveness of *energy and transport taxes*, differentiated according to air pollutant emissions and fuel efficiency; consider wider use of green taxes (petrol surcharge) to internalise environmental externalities and raise revenues;
- remove *environmentally harmful subsidies* (e.g. electricity and water) whilst giving due consideration to social concerns (e.g. replacement by direct income support for poor farmers and households so as not to distort price signals);
- improve *institutional integration within agriculture policies*, including through creating an environmental unit within the Ministry of Agriculture, Rural Development, Fisheries and Food;
- prepare a strategic environmental assessment of *transport policy*, including measures to reduce urban traffic congestion and develop rail and sea freight traffic, based on cost-benefit analysis;
- finalise the *strategy on energy and the environment*, with nationwide objectives and targets and expected completion dates, including for PEMEX and the Federal Electricity Commission's facilities.

strategic environmental assessment is carried out in the case of *transport sector policies*. Limited efforts have been made to influence modal split, resulting in a 78% increase in road freight traffic over the decade. There is very little institutional and market-based integration within the *agricultural sector*. On the contrary, support is provided for the development of intensive irrigated production, and the various agricultural and rural development programmes are designed and implemented with little regard to environmental protection. Progress in developing *renewable energy sources* has been slow, and further investments are needed to expand natural gas production and distribution to meet targets.

Integration of environmental and social concerns

In the last five to ten years, Mexico has made significant progress in reducing the health impacts of pollution. In particular, a *drop in child mortality rates* (e.g. from acute gastro-intestinal and respiratory diseases) is related to water disinfection and air quality improvements. An *active policy towards income and employment generation* through environmental/natural resources management

programmes is achieving positive and sizeable results. The quantity and variety of environmental information available from national authorities (e.g. data, indicators, environmental accounting, state of the environment reports, Pollutant Release and Transfer Registers) has progressed to an advanced stage, though (as in many other countries) statistics from different agencies are not always consistent and some gaps remain. Mexico recently introduced a new law on *transparency of government activities and public access to information*; this emphasis is reflected in the whole array of its environmental laws and regulations. SEMARNAT and the Ministry of Social Development are committed to work together to certify each other's programmes, with a view to meeting both environmental and social objectives. *Environmental education* in both the formal and non-formal educational systems is commendable, as are attempts to reach the least literate part of the population. Indigenous people have been given extended rights, which should enable them to benefit more from the biodiversity they help conserve.

However, efforts on all these fronts (e.g. health, income generation, education, rights of indigenous communities), as well as improvement of access to environmental services, need to be consolidated and extended. Poverty and regional inequalities hamper further progress. *Access to basic services* such as safe water, basic sanitation and electricity remain inadequate, particularly in less-developed regions and poorer communities (including urban slums). Respiratory illnesses due to urban air pollution, as well as indoor air pollution in rural

It is *recommended* to:

- further improve health and quality of life, particularly in areas with high marginalisation levels, by reducing the share of people who do not have *access to basic services* (e.g. safe water, basic sanitation, electricity);
- continue to promote initiatives that contribute to *income and/or job generation* together with environmental improvements (e.g. reforestation, eco-tourism, sustainable forestry), particularly in rural and less developed regions;
- further strengthen *environmental education and awareness*, especially among young people;
- continue the development and *use of indicators* to measure environmental progress and related institutional effectiveness;
- ensure practical implementation of the *right of access to environmental information*.

communities where wood-burning stoves are used, still need to be addressed. While a register of hazardous activities has been established, handling of hazardous chemicals and pesticides (especially by migrant farm workers) still entails significant occupational health risks. There is a correlation between poverty and deforestation, as clearing forested land for subsistence farming is often the only way marginalised farmers can secure a livelihood. In many instances such progress will require not only well targeted programmes and more efficient environmental management, but also increased financing.

Sectoral integration: agriculture and rural development

Fertiliser and pesticide use in Mexico is low by OECD standards. Over the last ten years, while farmland area has increased, per hectare use of nitrogenous fertilisers has fallen; this is partly because direct subsidisation of agricultural inputs has been eliminated and payments based on input use have decreased considerably. There have also been efforts to improve pesticide regulations and harmonise registration procedures with those in other OECD countries. Many harmful pesticides, including chlordane and DDT (two persistent organic pollutants), have been withdrawn from the market. *Soil and water conservation infrastructure* is being rehabilitated in rainfed areas to retain rainwater and curb surface water runoff and soil erosion. The ambitious 1992 *water pricing reform* has resulted in water user associations currently covering 80% of operational and maintenance costs in irrigation districts, compared with 20% in the early 1990s. The 1992 *land tenure reform* gave many Mexican farmers titles to property, thereby providing incentives to increase productivity in agricultural and forestry activities and to consolidate small plots into viable farms. The major agricultural policy reform process aims at improving the *market orientation of agricultural production*. The overall level of agricultural support in Mexico is low by OECD standards (Producer Support Estimate of 22%). The share of incentives aimed at intensifying agricultural production is falling significantly, while that of support more decoupled from agricultural production is increasing. Payments have been introduced to prevent use of fires as a farming practice. *Eco-certification* of forest management and of shade-grown coffee plantations is being developed. Further policy reforms give greater emphasis to creation of *new income sources in rural areas*. A new Law on Sustainable Rural Development was enacted in 2001. Rural development measures have been regrouped in a comprehensive national programme (the Concurrent Special Programme). More staff and a larger budget in the Ministry of Agriculture, Rural Development, Fisheries and Food (SAGARPA) are being devoted to rural development policy.

However, commercial farmers tend to *overuse water and chemicals* on high-potential irrigated land. Agricultural water use has increased over the last 10 years; intensity of water use was already high, to the extent that water has become a significant constraint on sustainable development in many agriculture areas. Every year new areas are brought under irrigation, largely due to public investment in water infrastructure and government transfers to support on-farm irrigation, including recently increased subsidies for groundwater pumping. Consumption of methyl bromide (bromomethane), an ozone layer depleting fungicide, has dramatically increased. Traditional and subsistence farming also contributes to environmental degradation, as it tends to encroach on forests and fragile land to sustain agricultural production. *Deforestation* continues at alarming rates in tropical forests, mainly due to forest conversion to farmland or grassland. On-going agricultural policy reforms could provide new incentives for development of profitable forestry, provided the otherwise unremunerated but environmentally beneficial public services associated with forests are compensated. In fact, the link between agricultural policy and forest management has remained weak.

It is *recommended* to:

- create *synergies among agriculture, rural development, environment and natural resource management*, particularly by reinforcing institutional integration between SAGARPA and SEMARNAT and their respective agencies at the Federal and state levels and by developing a national agri-environmental strategy with quantified objectives;
- pursue efforts towards *water pricing reform in agriculture*, particularly by progressively eliminating environmentally harmful irrigation subsidies;
- contribute to the *development of profitable forestry* in the context of agricultural policy reform; in particular, further reduce incentives to intensify agricultural production and compensate populations engaged in forest management for otherwise unremunerated though environmentally beneficial public services, possibly through PROCAMPO;
- promote consolidation of forest units on ejido land into viable larger-scale forest units in the context of *land tenure reform*, and introduce more flexibility to allow contracting out of forest management;
- explore use of *economic incentives* to increase the revenues of rural populations; in particular, evaluate the potential for further promoting eco-tourism in protected areas;
- assess the environmental effects of *PROCAMPO* support payments, as well as the anticipated environmental effects of NAFTA.

Though decoupled from production, the Programme of Direct Payments to the Countryside (PROCAMPO), introduced in 1994, has not led to significant changes in agricultural production. The option of green PROCAMPO payments for environmental purposes has scarcely been used, partly reflecting limited institutional integration between SAGARPA and SEMARNAT. The *environmental effects of PROCAMPO*, including changes in pressures on marginal farmland, have not yet been evaluated. Neither have the anticipated *environmental effects of NAFTA* (from 2003, free trade applies to all agricultural commodities except maize, beans, sugar and powdered milk). *Rural development policy* has supported poor populations, but with little attention to land use patterns. In some cases land reform has led to fragmentation of forestland or its conversion to farmland. A limited amount of ejido land has actually been sold; no attempts have been made to contract out management of large-scale forests on ejido land. Few rural development activities have combined environmental and poverty alleviation objectives. Use of economic instruments to increase local people's revenues should be further explored, as well as the potential for carbon sequestration and eco-tourism.

3. International Commitments

Mexico has greatly improved the manner in which its international environmental agenda is being addressed. To a great extent it has acted in line with other OECD countries, though it has not always been obliged to do so. It has assumed *responsibilities beyond its legal obligations* under the Climate Change Convention and the Montreal Protocol. Mexico ratified the Kyoto Protocol in 2000. CO₂ inventories have been carried out and effective measures have been taken to reduce GHG emissions. CO₂ emissions have been decoupled from GDP growth. Consumption of ozone-depleting substances has been much reduced, in advance of mandatory requirements. Mexico has important responsibilities relating to *its rich biodiversity*, but resources with which to protect the environment and conserve natural resources are limited. It has made considerable *progress towards protection of whales, sea turtles and dolphins* and has created the world's largest whale sanctuary. It promotes co-operation with like-minded countries that are also rich in biodiversity, with a view to creating an equitable system of natural resource use. *Bilateral environmental co-operation* has been strengthened, and *regional environmental co-operation* with other Latin American countries has increased. Mexico has provided technical assistance to support sustainable development in a number of Latin American countries. Tripartite environmental co-operation within North America is increasing and has led to concrete results; improvements were made recently in waste water treatment near the northern border.

However, Mexico is experiencing difficulties *implementing its legal regime*, as well as adequately *funding* projects, in order to meet its international commitments. Law and order in the environmental protection area could be improved, especially in an open economy like that of Mexico. *Air pollution* in the twin cities along the northern border has worsened, largely due to increasing international lorry traffic. Cross-border difficulties have arisen over *water use* in northern Mexico. Current plans concerning access to drinking water and basic sanitation are not consistent with undertakings under the UN Millennium Declaration or the objectives agreed at the Johannesburg Summit. Additional financial resources should be made available to ensure consistency. Regarding climate change, economic instruments are still not used as incentives for behavioural change or to finance subsidies encouraging use of cleaner energy. Activities to protect the *marine environment* and coastal ecosystems from land-based activities and pollution sources, and from pollution from ships, could be given greater attention and be better co-ordinated.

It is *recommended* to:

- continue to emphasise the use of *indicators and quantified targets* in developing result-oriented international environmental strategies;
- address the negative environmental impacts of growing *international trade and investment* in northern Mexico;
- strengthen both the institutions to enhance bilateral co-operation and the mechanisms that encourage international commitments, consistent with *environmental management decentralisation*;
- develop *like-minded countries* positions on international issues, such as biodiversity conservation, response to climate change, and international law, and assume leadership as appropriate;
- develop a national strategy to reduce the rate of growth of *GHG emissions*, with specific objectives and precise measures to be taken over the next few years, including under the proposed Clean Development Mechanism;
- seek the development of *integrated management of international water basins*, with special emphasis on efficient use of water;
- improve institutional mechanisms to provide better protection of the environment in *marine waters*, coastal waters and coastal zones, and increase involvement by SEMARNAT in this regard;
- continue to develop institutions and measures to combat marine *pollution from ships* and to respond rapidly to *oil emergencies*.