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Preface

The ECE Committee on Environmental Policy included the Environmental Performance Review of Latvia in its work programme in May 1997. In September of the same year, the preparatory mission for the project was organized, and a team of both national and ECE experts was formed to carry out the review. The Governments of Finland, Germany, Italy, Kazakhstan, Turkey and Ukraine made national experts available for the task. The Commission of the European Communities funded an adviser on EU practices. The Bilthoven Division of the WHO European Centre for Environment and Health contributed its expertise and resources for the preparation of the review of environmental health issues. The travel expenses of the experts from countries in transition and from the ECE secretariat were covered by extra-budgetary funds, which had been provided by Finland, Italy, and Norway. The successful conclusion of the project would not have been possible without the generous support from all these sources.

The review team prepared a report on the environmental performance of Latvia before, during and after the review mission in Riga in April 1998. The Latvian partners in discussion with the review team did not spare time or effort in responding to the queries and requests made. The report by the review team, including draft recommendations for the solution of existing problems in national environmental policy and management, was submitted for evaluation to the ECE Committee on Environmental Policy at its annual session in Geneva, on 1 October 1998. A high-level delegation from Latvia attended this session. It was headed by the State Minister for Environmental Protection and also included representatives of the Ministry of Transport and the Ministry of Welfare. The evaluation by the Committee was based on the in-depth preparation by two reviewing countries, Portugal and Ukraine. At the end of its evaluation, the Committee agreed on a final set of recommendations for inclusion in this publication.

The consideration of the EPR report confirmed the strategy that has been applied to Latvian environmental policy and management during the transition period. The inherited acute environmental problems have been tackled essentially on a case by case basis. The long-term solution of the problems will have to be accompanied also by strategic orientations for environmental policy. The development of such orientations in co-operation with both governmental and non-governmental partners is a need also related to the efforts by Latvia to approach European practices of environmental management. The Latvian Ministry of Environmental Protection and Regional Development is fully aware of the considerable resources that are required at all levels for the full transformation to such practices.

The ECE Committee on Environmental Policy and the ECE review team wish the Latvian environmental managers success in implementing and following up the policy recommendations that are included in this review.

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The preparatory mission for the project took place from 3-5 September 1997. The review mission was organized from 31 March to 9 April 1998 and the Peer Review was held in Geneva on 1 October 1998. The ECE Committee on Environmental Policy adopted the recommendations set out in this publication.

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ABBREVIATIONS

AQG	Air Quality Guideline
BAT	Best available technologies
BATNEEC	Best available technologies not entailing excessive cost
BEOROP	Baltic Environmental Agricultural Run-off Project
BOD	Biochemical oxygen demand
CEFTA	Central European Free Trade Agreement
CFC	Chlorofluorocarbon
CHP	Combined heat and power (plant)
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CM	Cabinet of Ministers
COD	Chemical oxygen demand
CPI	Consumer price index
CSB	Central Statistical Bureau
DHS	District heating system
DM	Deutsche mark
DOAS	Differential Optical Absorption Spectroscopy
EBRD	European Bank for Reconstruction and Development
EC	European Community
ECMC	Environmental Consultancy and Monitoring Centre
ECU	European currency unit
EDC	Environmental Data Centre
EEC	European Economic Community
EECONET	European Ecological Network
EFTA	European Free Trade Association
EIA	Environmental impact assessment
EIB	European Investment Bank
ELV	Emission limit value
EMAS	Environmental management and audit scheme
EMEP	Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe
EPA	Environmental Protection Agency
EPR	Environmental Performance Review
ESDP	European Spatial Development Perspective
ESI	Environmental State Inspectorate
EU	European Union
FDI	Foreign direct investment
FGD	Flue-gas desulphurization
GDP	Gross domestic product
GMO	Genetically modified organism
GNP	Gross national product
HFO	Heavy fuel oil
HMs	Heavy metals
HP	Heating plant
HPP	Hydropower plant
IEA	International Energy Agency
IFI	International financial institution
IPCC	Intergovernmental Panel on Climate Change
IPPC	Integrated Pollution Prevention Control
ISO	International Organization for Standardization
IUCN	World Conservation Union
LATAK	Latvian National Accreditation Office
LEIF	Latvian Environmental Investment Fund
LEPF	Latvian Environmental Protection Fund

LHA	Latvian Hydrometeorological Agency
LPG	Liquefied petroleum gas
LU	Livestock unit
MARPOL	International Convention for the Prevention of Pollution from Ships
MEPRD	Ministry of Environmental Protection and Regional Development
MoA	Ministry of Agriculture
MoT	Ministry of Transport
MoW	Ministry of Welfare
MPE	Maximum permissible emission
MSC	Meteorological Syntesizing Centre
MWWTU	Municipal waste-water treatment unit
NEAP	National Environmental Action Programme
NEPP	National Environmental Policy Plan
NGO	Non-governmental organization
NMVOC	Non-methane volatile organic compound
ODS	Ozone-depleting substances
OECD	Organisation for Economic Co-operation and Development
PCB	Polychlorinated biphenyl
PCDD	Dioxin
PHARE	Assistance for Economic Restructuring in the Countries of Central and Eastern Europe
PIP	Public Investment Programme
PM	Particulate matter
POP	Persistent organic pollutant
PPP	Polluter-pays principle
R&D	Research and development
REB	Regional Environmental Board
REC	Regional Environmental Centre for Central and Eastern Europe
SEE	State Ecological Expertise
SMEB	Special Municipal Environmental Budget
SMEs	Small and medium-size enterprises
SOE	State-owned enterprise
SSEB	Special State Environmental Budget
TACIS	Technical Assistance to the Commonwealth of Independent States
TEC	Thermoelectric plants
TPE	Temporary permissible emissions
TPES	Total primary energy supply
TPP	Thermal power plant
UNECE	United Nations Economic Commission for Europe
UNIDO	United Nations Industrial Development Organization
US$	United States dollar
US/EPA	United States Environmental Protection Agency
USAID	United States Agency for International Development
VASAB	Visions and Strategies Around the Baltic Sea
VAT	Value-added tax
VOC	Volatile organic compound
WHO	World Health Organization
WMO	World Meteorological Organization
WTO	World Trade Organization

SIGNS AND MEASURES

..	not available
-	nil or negligible
.	decimal point
ha	hectare
t	metric tonne
g	gram
kg	kilogram
mg	milligram
:g	microgram
ng	nanogram
m^2	square metre
m^3	cubic metre
km	kilometre
km^2	square kilometre
toe	tonne of oil equivalent
l	litre
ml	millilitre
min	minute
s	second
PJ	petajoule
GJ	gigajoule
kW_{el}	kilowatt (electric)
kW_{th}	kilowatt (thermal)
MW_{el}	megawatt (electric)
MW_{th}	megawatt (thermal)
MWh	megawatt-hour
TWh	terawatt-hour
Bq	becquerel
y	year
cap	capita
DWT	Dry weight tonne

CURRENCY

Monetary unit: Lat (Kat)

Exchange rates: The Latvian National Currency, the lat, was introduced in May 1993.

Year	1 US$	1 ECU	1 DM
1992	0.74	0.95	0.47
1993	0.67	0.79	0.41
1994	0.56	0.67	0.35
1995	0.53	0.69	0.37
1996	0.55	0.67	0.35
1997	0.58	0.65	0.33
1998*	0.60	0.65	0.33

Source: International Financial Statistics, IMF, 1998

* on 1 September 1998

Introduction

FEATURES OF LATVIA

I. Physical structure and human development

The political context

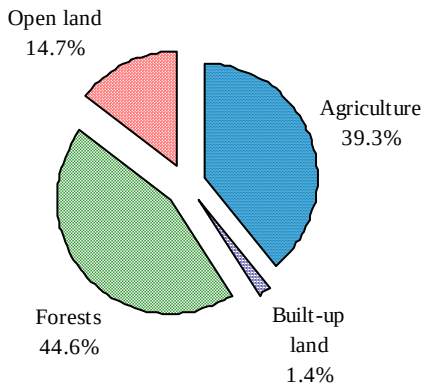
Located on the eastern coast of the Baltic Sea, Latvia shares borders with the Russian Federation and Belarus to the east, Lithuania to the south and Estonia to the north. With a coastline of over 500 km, the country's history and present development are closely linked to the regional Baltic context. An independent Latvian nation was proclaimed for the first time in November 1918. It ended with the annexation by the USSR in 1940. After the Second World War, extensive collectivization took place in connection with a wave of deportations. At the same time, the industrialization of the country was accelerated. Independence was again proclaimed on 4 May 1990 and resumed de facto in September 1991. Latvia is an associate member of the European Union (EU), and applied for full EU membership in October 1995. In February 1998, the "Europe Agreements" entered into force.

Land and climate

The climate is influenced by maritime currents and thus humid and moderately warm, with precipitation particularly from October to March. Sharp changes in weather conditions are common in Latvia. Under the influence of cyclones, winters are relatively mild, but summers are cool, rainy and cloudy.

The average altitude of the territory is low (87 m above sea level). The highest elevation is at 312 m in the eastern hills. An abundance of forests, water and bogs characterizes its topography. 39 per cent of the country's surface is used for agricultural purposes. There has been a steady decline in agricultural land use in the past 40 years, with a loss of 1 million ha of agricultural land over this period in favour of forests. This trend is continuing, with the surface of arable land decreasing annually. Of the total agricultural area of 2.53 million ha, 68 per cent are arable lands, 31 per cent meadows and pastures and 1 per cent permanent crops. Forests cover 44.6 per cent of the country, and bogs 5.6 per cent (see Figure I.1).

Figure I.1: Land use in Latvia, 1996



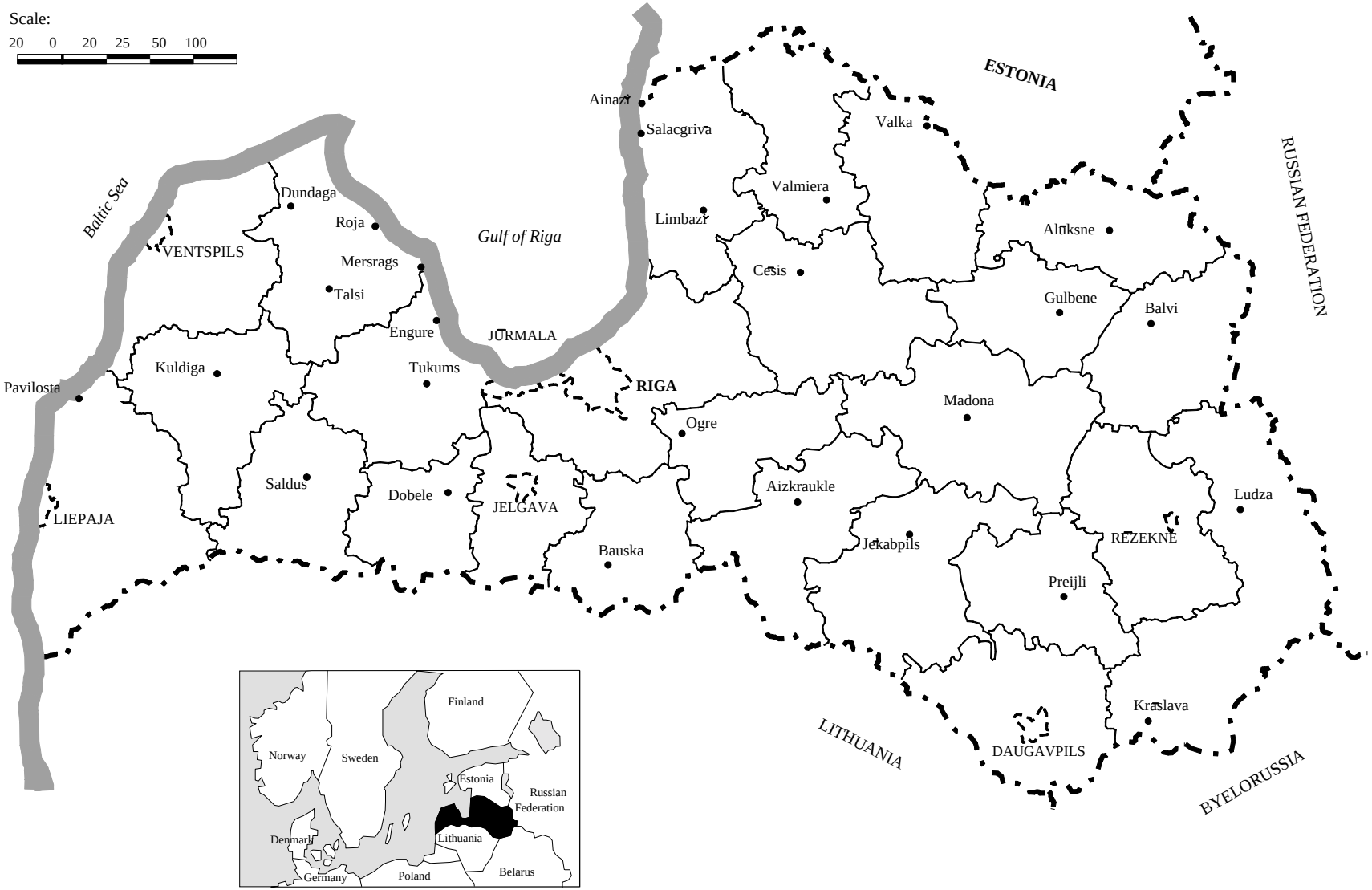
Source: IEDS database

Latvia is endowed with abundant surface water and groundwater resources of 34 and 4.7 billion m^3 per year, respectively, and a fairly high density of bodies of water and watercourses (0.58 km/km^2), all forming part of the Baltic Sea watershed. There are many small, shallow lakes, with over 2 250 lakes of more than 1 ha. The main rivers are the Daugava, Lielupe, Gauja and the Venta, which are all transboundary. Rivers and lakes alike have suffered from human activity, the main problems being eutrophication and other forms of pollution. Latvia uses only 1.7 per cent of its water resources – one of the lowest levels in Europe.

Population

Latvia is the second largest Baltic State after Lithuania in terms of population. It has 2.48 million inhabitants (1997) and a population density of 38 inh/km^2. Birth rates are low and the population is ageing. 13 per cent of the population was 65 or older at the beginning of 1996. According to the population register in July 1997, the biggest minority is Russian (30.2 per cent). The other main minorities are Belarusian, Ukrainian and Polish.

Map of Latvia
(administrative units and main cities)



They each make up between 2 and 4 per cent of the population. Just over 1 per cent is Lithuanian. The official language of the country is Latvian.

The demographic profile is marked by a large imbalance between the urban and rural population (1996). With 69 per cent of Latvia's population living in urban areas, it surpasses the European average. Moreover, 35.3 per cent of the total population lives in the Riga conurbation, which has 883 000 inhabitants. Daugavpils is the second largest city, with 128 000 inhabitants, followed by Liepaja (98 000 inhabitants), Jelgava, Jurmala, Rezekne and Ventspils, with populations between 70 000 and 40 000.

Unemployment in the agricultural sector has encouraged people to migrate to the cities in recent years. In spite of the relatively small size of its towns, Latvia experiences urban population pressures mainly because of its poor urban infrastructure. The main problems are water supply and sanitation, as well as poor urban transport facilities, growing pressure from the increasing number of cars, and the critical housing situation.

At 7.2 per cent (1997), Latvia's unemployment rate is the highest in the Baltics. Women are especially affected, making up 55.9 per cent of the unemployed. The 30-49 age bracket (both sexes) and unskilled workers and workers with specialized secondary education are also hard hit. These figures seem to reflect the large-scale lay-offs in occupations and sectors of the centrally planned economy that have since undergone major restructuring. Long-term unemployment is a growing phenomenon in the labour market - it is estimated that 17.2 per cent of job seekers have been unemployed for 3 to 4 years - contributing, together with low retirement pensions, to increasing poverty in Latvia. Calculations reveal a relatively wide poverty gap, especially if the subsistence minimum is used as the poverty threshold; the monthly outlays of most of the poor fall 25 per cent short of the threshold. Unemployment reflects regional disparities in economic development; while unemployment in Ventspils and Riga stands at barely 3 per cent, it soars in rural regions, up to 29 per cent in Rezekne and Latgale.

The difficult living conditions resulting from the economic recession, lifestyle factors and the poor quality of the environment may have an impact on human health. Life expectancy is well below the European average. The national average is 69.3 years, but in rural areas and among the male population it is even lower. Infant mortality is also higher than the average in central and eastern Europe or the EU. It is estimated that around 40 per cent of children and 50 per cent of adults suffer from various health problems related to environmental conditions (chronic bronchial asthma and allergic respiratory diseases in highly polluted cities such as Olaine and Ventspils, diseases relating to poor water quality, repeated outbreaks of gastrointestinal infections, bacterial dysentery and hepatitis A in several cities, etc.- for more details, see chapter 12).

Legal, administrative and institutional structures

The Declaration of the Renewal of the Independence of the Republic of Latvia, passed in May 1990 by the Latvian Parliament, proclaimed the restoration of the parliamentary system. The Satversme (Constitution), which was originally adopted in 1922, was restored in 1993. The highest legislative body in Latvia is the one-chamber Saeima (Parliament), whose 100 deputies are elected by direct suffrage for a three-year term. Elections for the 6th Saeima were held in October 1995. The next elections will be in October 1998.

Local issues are the responsibility of elected local governments, which have their own budgets and the right to levy local taxes. Local administration has a two-tier structure. At present, Latvia is divided into 26 counties and seven municipalities (see map, page 2). However, the administrative structure at local and regional level is undergoing extensive restructuring and there are plans for a further decentralization. The main issue in the current regional policy is to foster the development of disadvantaged regions. A Law on Areas which Need Special Support was passed in 1997. It contains criteria and conditions that 'disadvantaged' regions have to meet to apply for State support.

II. Economic conditions

Development of the economy

The breakdown of regulating mechanisms and the collapse of intra-Soviet trade relations account for Latvia's sharp economic decline in 1991-1992. Traditionally, the lack of natural resources had forced Latvia to turn to processing industries, favoured by a well-developed transport infrastructure. The timber, paper and pulp industries and food processing are such traditional industries. However, with its integration into the

former Soviet Union's centrally planned economy, Latvian industry became less diversified. It specialized in heavy industry, machine building and electronics (representing 55 per cent of total industrial production before independence) with a heavy reliance on imported raw materials. With the transition, these imports were paid for at world market prices. In 1992, energy imports amounted to 27 per cent of GDP.

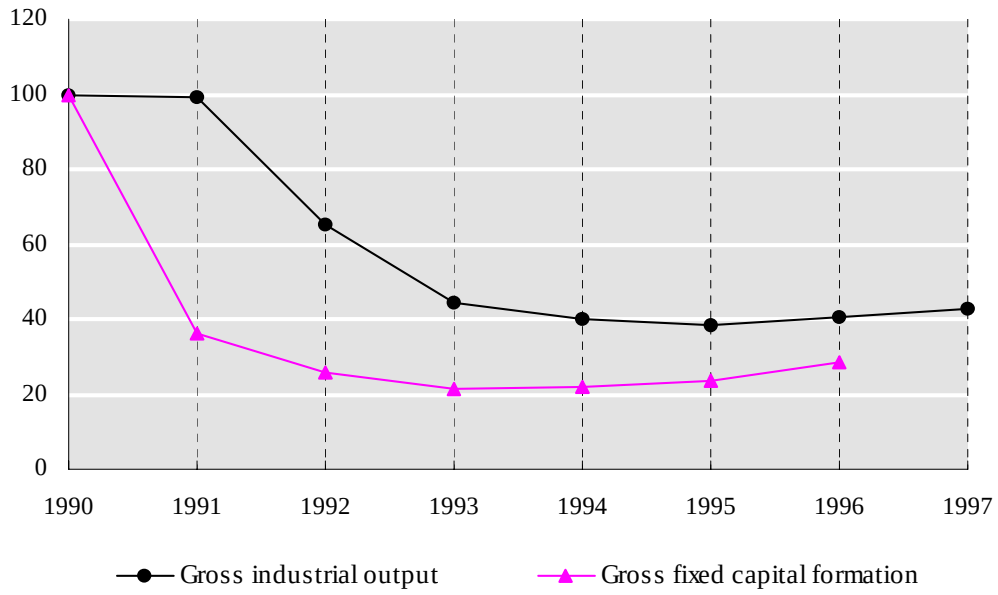
Industrial output remained depressed in 1994 and 1995 (see Table I.1 for selected economic indicators), but picked up in 1996, ending the year with a modest 0.7 per cent increase. Yet, this is merely one third of its 1989 level. Light industry and food processing recovered in 1996, as did timber and wood processing. Since the beginning of the economic reforms, the production of electrical machinery and equipment, communication equipment, and machinery has continued to decline.

GDP suffered a severe decline in 1992-1993, but growth picked up marginally as of 1994, mainly on account of a growth in services, with positive rates in 1996 (3.3 per cent), 1997 (6.5 per cent) and a forecast of 5-6 per cent for 1998. However, growth has remained slow largely because of a very low domestic demand, which has had little impact on the economy, even though since 1996 the economy has recovered from the 1995 banking crisis. As of 1995, however, investments have taken up, at stronger growth rates than industrial output, after plummeting in the first years of independence (see Figure I.2).

In 1992, the transport and transit industry sector accounted for almost 17 per cent of GDP. With the expansion of trade relations and new transport routes, transit transport is set to remain a major sector of the country's economy (see Figure I.3). Cargo turnover in Latvia's ports increased by 15 per cent in the first three months of 1997 over the same period of the preceding year. Latvia is a major transit and storage country for energy products, mainly from the Russian Federation. A major oil pipeline crosses the country from Novopololtsk in Belarus to the oil terminals of Ventspils. Gas and LPG also transit through Latvia. With three international ports, Ventspils, Liepaja and Riga, maritime transport is the main transit sector. Within the economic space of the USSR, the first two ports were especially important because of their ice-free conditions. Ventspils is Latvia's largest port. Oil and oil products account for over 70 per cent of its total turnover, chemical industry for the remaining 30 per cent. In the first quarter of 1997, it accounted for 77 per cent of the country's total cargo turnover. Liepaja used to be a major Soviet naval base, and economic activity there has been limited since the transition, with a modest turnover of timber and construction materials. However, a major restructuring of the port is expected to follow the recent creation of a special economic zone.

Figure I.2: Gross industrial output and gross fixed capital formation, 1990-1997

Indices, 1990=100



Source: UN/ECE Economic Survey of Europe, 1998 No.1.

Table I.1: Selected economic indicators for Latvia, 1991-1997

	1991	1992	1993	1994	1995	1996	1997
GDP in constant prices 1995 Lats, million	4 243.4	2 764.2	2 353.2	2 368.4	2 349.2	2 427.7	2 586.7
GDP in current prices Lats, million	143.3	1 004.6	1 467.0	2 042.6	2 349.2	2 829.1	3 211.2
GDP in current prices US$, billion	..	1.5	2.2	3.7	4.5	5.1	5.5
GDP (% change over previous year) (on constant prices 1995)	- 10.4	- 34.9	- 14.9	0.6	- 0.8	3.3	6.5
Industrial output (% change over previous year)	..	- 34.6	- 32.3	- 6.8	- 3.7	5.5	6.1
Agricultural output (% change over previous year)	- 2.1	- 15.1	- 13.4	- 16.9	- 3.4	- 11.0	..
Measured labour productivity (% change over previous year)	- 9.6	- 32.3	- 8.0	4.0	- 0.3	4.1	..
CPI (% change over the preceding year, annual average)	172.2	951.2	109.1	35.7	25.0	17.7	8.5
PPI (% change over the preceding year, annual average)	192.0	1 310.0	117.1	17.0	12.0	13.8	4.3
Total employment (% change over previous year)	..	..	- 7.4	- 10.1	- 3.4	- 2.7	1.9
Registered unemployment (% of labour force)	..	..	5.8	6.5	6.6	7.2	6.7
Balance of trade in goods and non-factor services (million US$)	..	..	332.0	60.0	- 106.0	- 414.0	..
Current account balance (million US$)	..	207.0	417.0	201.0	- 16.0	- 279.0	- 441.0
(as % of GDP)	..	..	..	5.5	0.4	5.4	8.0
Foreign exchange reserves (million US$)	..	50.0	334.0	545.0	503.0	652.0	702.0
(as months of imports)	..	0.6	3.2	3.9	2.7	2.5	2.4
Total net external debt (billion US$)	..	-	- 0.1	- 0.2	- 0.1	- 0.2	- 0.3
Ratio of net debt to exports	..	1.0	- 6.0	- 11.0	- 5.0	- 9.0	- 11.0
Ratio of gross debt to GDP	..	-	- 7.0	10.0	9.0	8.0	7.0
Net FDI inflows (million US$)	..	43.0	45.0	214.0	180.0	382.0	418.0
(as % of GDP)	..	2.9	2.1	5.9	4.0	7.4	7.6
Cumulative FDI (million US$)	..	43.0	88.0	302.0	482.0	864.0	1 282.0

Source: UNECE and national statistics.

Construction, which had suffered enormous losses in the first years of transition (annual output nearly halved in the years 1991-1993), recovered well in 1994 and 1995 (11-16 per cent), but again lost momentum in 1996.

The agricultural sector, however, is the worst off. Output fell by a cumulative 58.4 per cent over the period 1991-1994 and has continued declining since, albeit less drastically. This persisting crisis is explained by the lack of input, the lack of markets and upstream and downstream bottlenecks.

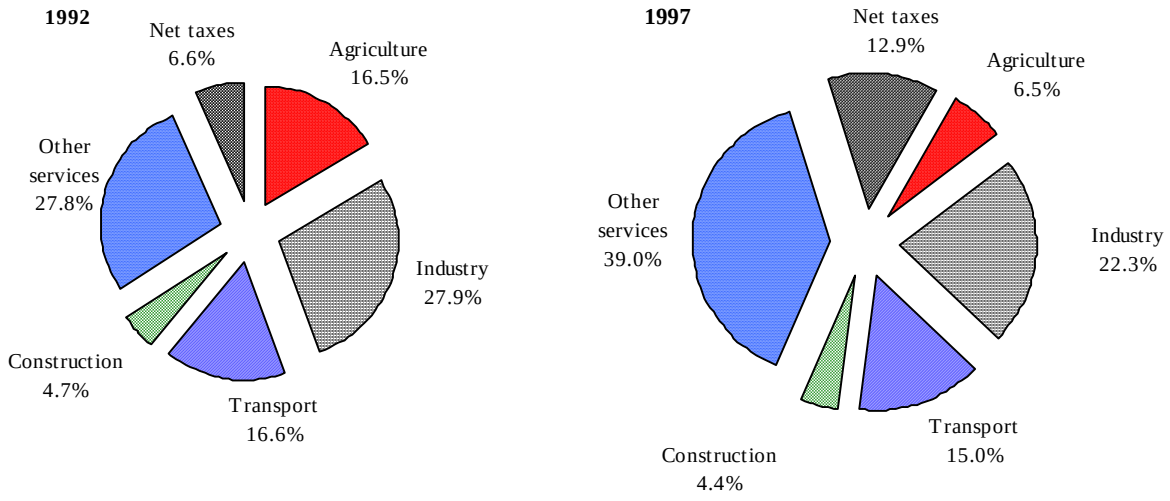
The sectoral composition of GDP has changed since transition, as the contribution from the agricultural sector has shrunk. Indeed, agricultural output, which accounted for 16.5 per cent of GDP in 1992, saw its share in GDP dwindle to 6.5 per cent in 1997. The service sector has expanded, accounting for 39.0 per cent of GDP in 1997, as opposed to 27.8 per cent in 1992. Construction and industrial output, in terms of GDP, have remained stable or declined only marginally.

The past years have seen an expansion of the private sector, which accounted for 64 per cent of employment and contributed 60 per cent to GDP in 1997, and a growing importance of the transit sector. Although excess employment is still estimated to be quite high, there has been a noticeable gain in labour productivity. Also, the country's trade performance in 1997 seems to reflect an increased productive capacity in a number of export sectors (e.g. wood and textiles) and the positive effects of the privatization efforts and investments of recent years.

Monetary policy

In the first year of independence and economic transition, the Latvian economy followed the hyperinflation of the rouble, which reached almost 400 per cent in the first six months of 1992. The

Figure I.3: Structure of GDP by sector , 1992 and 1997



Source: UNECE macroeconomic database.

Agriculture refers to "Agriculture, hunting and forestry" and "Fishing" (NACE A-B).
Industry refers to "Mining and quarrying", "Manufacturing" and "Electricity, gas and water supply" (NACE C-E).
Transport refers to "Transport, storage and communication" (NACE I).

year closed with a December-over-December increase of 951.3 per cent. With the introduction of a national currency (temporary Latvian rouble in May 1992 and a domestic currency, the lat, in May 1993), inflation slowed, reaching monthly one-digit figures as of the second half of 1993. Inflation has declined steadily, with a December-over-December change of 35.9 per cent in 1994, 17.6 per cent in 1996, an annual inflation rate of 8.4 per cent in 1997, and 6 per cent in March 1998 over March 1997. The essential aspects of the Latvian monetary policy have been to keep interest rates down, opting for a fixed exchange rate regime and a control through the Bank of Latvia of refinancing rates and market operations, including the foreign exchange market. Over 1996, the Bank cut refinancing rates from 24 per cent in January to 9.5 per cent in December, and at present, refinancing rates stand at 4 per cent (March 1998). The effects of the banking crisis which hit Latvia in 1994-1995, caused at least partially by uncontrolled capital inflows and the ensuing rapid increase in loans, many of which were “bad” loans, have largely been overcome.

The Investment Bank of Latvia was founded in 1992 under the auspices of the Baltic Investment Programme. This Programme envisaged a bank that could provide medium- and long-term finance to commercially viable enterprises in Latvia. Currently, the Bank provides these services at more competitive rates than other commercial banks in Latvia, and since October 1996, it has been the official financial intermediary of the joint venture programme of PHARE-TACIS.

Foreign investment and financing

To promote foreign investment, a special agency, the Latvian Development Agency, was set up in 1993. Also involved in promoting export, its main task in terms of foreign direct investment (FDI) is to assist and advise foreign investors. It also submits proposals for legislative amendments concerning investment policies. In terms of capital, the biggest contributor to FDI is the United Kingdom (19 per cent), followed by the United States (14 per cent), Denmark (12 per cent), Finland (9 per cent) and Germany (7 per cent).

External financing and the relationship with international financial institutions are crucial for the development of the Latvian economy. Latvia joined the International Monetary Fund (IMF) in September 1992 and the World Bank in August 1992. The same year, it received an IMF loan worth US$ 80 million to back its monetary reform and the introduction of a national currency. In March 1998, its special drawing right (SDR) stood at 6.07.

Latvia has received a relatively high and stable share of FDI in the region. Whereas external financial flows into Estonia, which were very high at the beginning of the transition period, began to stagnate in 1995-1996, flows to Latvia have remained constant. In 1997 it accumulated the highest FDI stocks in the region (US$ 775 million out of a total of US$ 1 787 million); net flows exceeded 5 per cent of GDP. Inflows include loans raised on foreign markets, offset by portfolio investments abroad, marking the country's access to foreign credit markets. In January 1997, Latvia received its first international credit rating: a triple B from Standard and Poor's, which was renewed in 1998.

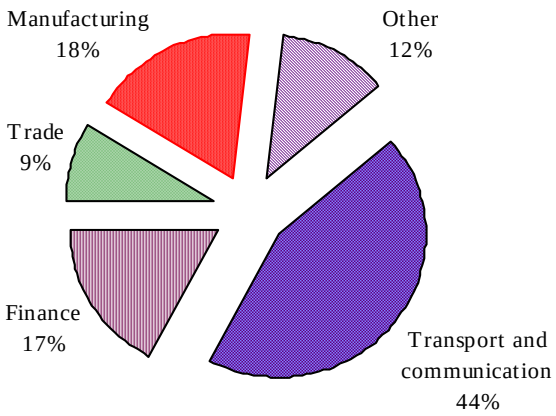
Latvia's telephone network was the first public utility to be privatized in 1994. A British-Finnish consortium, Tilts Communications, owned by Cable & Wireless (70 per cent) and Telecom Finland (30 per cent), initially agreed to invest over $160 million in modernizing Latvia's telecommunications infrastructure, with further investments expected in 1998. Lattelekom is Latvia's single largest investment recipient.

Foreign trade and reserves

Since 1995, Latvia's export-to-GDP ratio has stood at 30 per cent and its import-to-GDP ratio has increased steadily since 1994, reaching 50 per cent in 1997. At the beginning of 1997, export growth slackened, resulting in smaller surpluses than the preceding year; the growing surplus in the transport sector was offset by the deficit in tourism. However, Latvia's trade in goods and services grew at the fastest pace in the region, with recovery picking up toward the end of 1996 and trade volumes growing by 20 per cent in 1997. Exports grew 22.2 per cent to 972 million lats and import surged 23.8 per cent to 1 582 million lats in 1997. In general, the balance of trade deteriorated by some 15 per cent between the first half of 1996 and the first half of 1997, which is moderate compared to its Baltic neighbours (Estonia 50 per cent and Lithuania 65 per cent). The trade deficit arose largely in trade with other countries in transition. Exports to western market economies picked up considerably. The EU share in Latvia's imports is 53 per cent, in Latvia's exports it is 49 per cent. Latvia's commodity exports have seen an increase in wood, wood products and textiles. Machinery, mineral products and transport vehicles constitute the main commodity imports. However, exports are still largely undiversified, with a mere five products accounting for over 72 per cent of the country's exports.

The current account deficit worsened in the first half of 1996, reaching 7.4 per cent of GDP, in spite of a significant surplus in the export of transport services. As concerns the country's external debt, the aggregate liquidity ratio of 3 months worth of imports was again not attained in 1997 (slightly

Figure I.4: Foreign direct investment by sector, 1992-1997



Source: OECD, Investment Guide for Latvia, 1998.

worsening in comparison to 1996 to 2.3 months). Increases in foreign exchange reserves were paralleled by a rapid growth in imports of goods and services. However, official reserves exceed gross debt, and the ratio of gross debt to GDP has been falling by 1 per cent a year since 1994.

Privatization

Privatization was considered a major policy objective and a basic legal framework was set up in 1991-1993 and has since gradually developed. A Privatization Agency was created in 1993. Lease buy-outs were a major form of privatization in the first years. The general approach in the early stages was cautious and decentralized. The rights of former owners were recognized. Small and medium-sized enterprises were very rapidly privatized.

The privatization of State-owned enterprises, especially in the key sectors, long remained controversial. The Latvian gas company, Latvijas Gaze, was turned into a joint-stock company in January 1994, and at the beginning was the Baltic gas company with the largest State shareholding (98 per cent). For the time being it is managed by the Latvian Privatization Agency. The objective is to gradually sell off shares to investors and commercialize the company's operations. Two strategic investors, the German consortium Ruhrgas/Preussen Elektra and the Russian Gazprom, have acquired a 32.5 per cent stake in Latvijas Gaze.

Since 1995, mass voucher programmes have been carried out. The Privatization Agency has held public auctions to accelerate the sale of the remaining State-owned firms. A law passed in March 1993 provided for the privatization in agriculture, which has created a class of smallholders. Most collective farms have been transformed into joint-stock companies.

The privatization process is now considered practically completed or nearing completion: in mid-1997, 94 per cent of all State enterprises were either privatized or assigned for privatization. New laws adopted in 1997 envisage the possibility of selling land, albeit only in certain cases. Such sales could begin in 2000, when the land reform is completed.

PART I: THE FRAMEWORK FOR ENVIRONMENTAL POLICY AND MANAGEMENT

Chapter 1

LEGAL INSTRUMENTS, INSTITUTIONAL ARRANGEMENTS AND ENVIRONMENTAL REGULATIONS

1.1 The legal framework

Legal instruments

According to its Constitution, Latvia's variety of legal acts has the following hierarchy:

- Constitution;
- International treaties approved by the Parliament: they prevail over domestic law;
- Laws;
- Regulations of the Cabinet of Ministers having the force of law (theoretically only in cases of urgent necessity between sessions of Parliament and if the respective issues are not covered by a law; also, a legal basis authorizing the Cabinet is required. Parliament has to approve these regulations three months after reconvening. If they are not approved within this time, they lose their legal force);
- Other regulations of the Cabinet of Ministers;
- Binding local government regulations.

The President of the State, the Cabinet of Ministers, a quorum of at least five members of Parliament, or at least 1/10 of the electorate can propose legislative initiatives. Normally, the competent ministry will draft a law, and at their weekly meeting the State Secretaries will determine which ministries will be consulted. This varies according to the topic, but the Ministry of Finance, the Ministry of Justice and the European Integration Bureau (which is directly subordinated to the Prime Minister) are always involved. The consulted ministries may comment on the draft, and the responsible Committee of Cabinet Ministers harmonizes these various opinions. Once approved by the Government, the draft law is submitted to the Parliament. There, it has to pass three readings before the President of State promulgates it.

Environmental legislation

Latvia's environmental legislation consists of many individual statutes, adopted at different times, rather than an environmental legal system. Some regulations, e.g. standards on emissions and environmental quality, as well as the old Water and Air Protection Laws, date from the Soviet period. New legislation is constantly being adopted. In particular, new environmental regulations are now being developed in connection with the EU approximation process.

The former Soviet legislation continues to be applied if it is not contrary to the Constitutional Law on the National Status of the Republic of Latvia. According to the Decision of the Council of Ministers on the Application of Norms and Technical Standards in the Republic of Latvia (1992), norms and standards apply until new ones are adopted or the existing ones are explicitly revoked. To increase legal certainty, there is a proposal to revoke all Soviet laws and regulations, including the standards from the Soviet period, as from 1 January 1999. It is expected that, after the necessary readings in Parliament, there will at least be a list clearly indicating which laws from that period remain in force and which ones are revoked.

The Law on Environmental Protection of 1991, an "umbrella law" with basic rules and principles on different aspects of environmental protection and management of natural resources, the Law on State Ecological Expertise of 1990 with its EIA instrument, and the Law on Natural Resources Taxes of 1995, including economic incentives, economic sanctions and funding of State and local environmental management, are particularly important. The Law on Environmental Protection, one of the very first laws adopted after

independence, was already amended in 1997, and is to be revised and modernized again in the near future. Laws and regulations that are particularly relevant for environmental management and currently in force or in preparation are listed in the following box.

Box 1.1: Selected laws and regulations related to environmental management in force or under preparation

Laws and regulations in force

The Constitution (1922, restored in 1993)
Constitutional Law on the National Status of the Republic of Latvia (1991)
Law on Municipalities (1994)
Law on Environmental Protection (1991, amended 1997)
Law on State Ecological Expertise (1990)
Law on Natural Resources Taxes (1995, amended 1996)
Regulations of the Cabinet of Ministers on the Order of Adaptation of the Norms of Nature Resource Tax (1996)
Law on the Procedure of Termination of Activities of Enterprises and Organizations (1992)
Law on the Protection of the Air (1973)
Law on Water (1972)
Water Use Permit Regulations (1997)
Law on Hazardous Waste (1993, amended in 1996)
Regulations on the Order of Preparing Documents for Activities with Hazardous Waste (1996)
Regulations on Classification of Hazardous Waste and Criteria of Hazardousness (1997)
Law on the Use and Protection of Animals (1981)
Law on Fishing (1995)
Law on Hunting (1995)
Law on Forest Management and Use (1994)
Law on Specially Protected Nature Areas (1993)
Law on Kemeri National Park (1997)
Law on North Vidzeme Biosphere Reserve (1997)
Regulations on Engure Lake Nature Park (1998)
Regulations on Physical Planning (1998)
Law on Subsoil (1996)
Law on Continental Shelf and Economic Zone (1993)
Law on Shelter/Protected Belts (1997)
Law on Chemical Substances and Chemical Products (1998)
Law on Radiation Protection and Nuclear Safety (1994, amended 1997) and implementing regulations
Law on Environmental Impact Assessment (1998)

Selected environmental laws and regulations under preparation

Law on municipal waste
Law on the protection of species and habitats
Surface water quality standards, 1998
Law on risk evaluation and risk assessment

1.2 The policy framework

The Government does not regard environmental and regional development as top priorities, but these topics are, nevertheless, among the priorities. The National Environmental Policy Plan (NEPP), which was accepted by the Cabinet of Ministers on 25 April 1995, defines environmental policy goals for the coming decades, as well as priority problems. It also contains basic principles and instruments for the implementation of policy. Ministries, interested parties, economic sectors and public associations were involved in drawing up this strategic document – often in their personal rather than institutional capacity. An update of NEPP is planned for August 1998.

More specific steps are contained in the National Environmental Action Programme (NEAP), which was adopted by the State Minister for Environmental Protection in January 1997. During its development, the Regional Environmental Boards were consulted. Although the NEAP proposes some 300 actions, it is mainly used in the fields of biodiversity, agriculture, waste and water. The actions it includes are a collection of possible measures and are not in any order of priority. The NEAP is conceived as the key instrument for recording both requirements and progress in environmental protection. Due to the workload implied by the approximation process, this development process had stopped for some months, but work seems to be resuming. It is envisaged that more partners like industry and NGOs will be involved in the continuous updating of NEAP.

Although the international principle of "sustainable development", to which Governments subscribed at UNCED, in Rio de Janeiro in 1992, is taken into account when formulating policy goals, plans, rules and regulations, it does not play a particularly prominent role. The principle is not explicitly included in the Law on Environmental Protection but only reflected to some extent. In new laws, the principle is included, but not much applied so far.

Consequently, Latvia has decided to concentrate its resources on other areas of global and regional cooperation (see Chapter 5) rather than actively taking part in the Rio follow-up process. Baltic Agenda 21 did not attain high priority. However, it has played a stimulating role in the discussion concerning the establishment of a national commission on sustainable development. There is a proposal to establish such a Commission to deal with the concept of sustainability in general and supervise the implementation of Baltic Agenda 21 in particular.

1.3 Basic structure of environmental management

The structure of the Ministry of Environmental Protection and Regional Development

The Ministry of Environmental Protection and Regional Development (MEPRD), established in 1993 to replace the Environmental Protection Committee and the Ministry of Architecture and Building, is responsible for the majority and the most important issues of environmental protection. However, several other ministries are responsible for the administration of certain sectors of environmental protection and the use of land and natural resources: the Ministry of Welfare, the Ministry of Agriculture, the Ministry of the Interior and the Ministry of Transport.

The main task of MEPRD is to work out and, together with other State administrative institutions, implement common policies for environmental protection, conservation and rational use of natural resources, regional development, local State administration, tourism, hydrometeorology, building and subsoil use. The structure of the Ministry is shown in Figure 1.1.

The MEPRD has a core of about 120 staff. In addition, a complex system of subordinated and supervised institutions and a network of eight Regional Environmental Boards (REBs) with another 1 600 staff depend on its budget (for details, see Figure 1.2). Institutions subordinated to the Ministry - e.g. the State Environmental Expertise Board, the Environmental Data Centre, the eight REBs, and the State Environmental Inspectorate - are under the direct control of MEPRD. They either operate on the regional level (e.g. REBs) or carry out specific functions for the Ministry (e.g. Inspectorate). The control of MEPRD over "supervised" institutions is less strict; the Minister merely advises those institutions on their work (e.g. State Geology Service). Other institutions of which the Ministry is 'in charge' are not State institutions as such; they merely fulfil functions on behalf of the State (e.g. non-profit State enterprise "Vides projekti"). Efforts to establish an environmental protection agency, bringing together most of these institutions and performing their functions, have not yet succeeded.

Regional Environmental Boards

In terms of controlling and enforcing environmental legislation, in particular legal requirements to prevent and limit pollution, the most important institutions are the Regional Environmental Boards (REBs). There are eight regional boards, each of them covering two to four administrative districts. They carry out environmental policy on the regional level. Their tasks include:

- undertaking environmental expertise on the regional level (see also section 1.6 below),
- supervising the use of natural resources (including pollution) in the region, including controlling compliance with quotas, limits and licences, and
- licensing the use of natural resources.

Municipalities

Some tasks regarding environmental protection are delegated to local municipalities. The most important are:

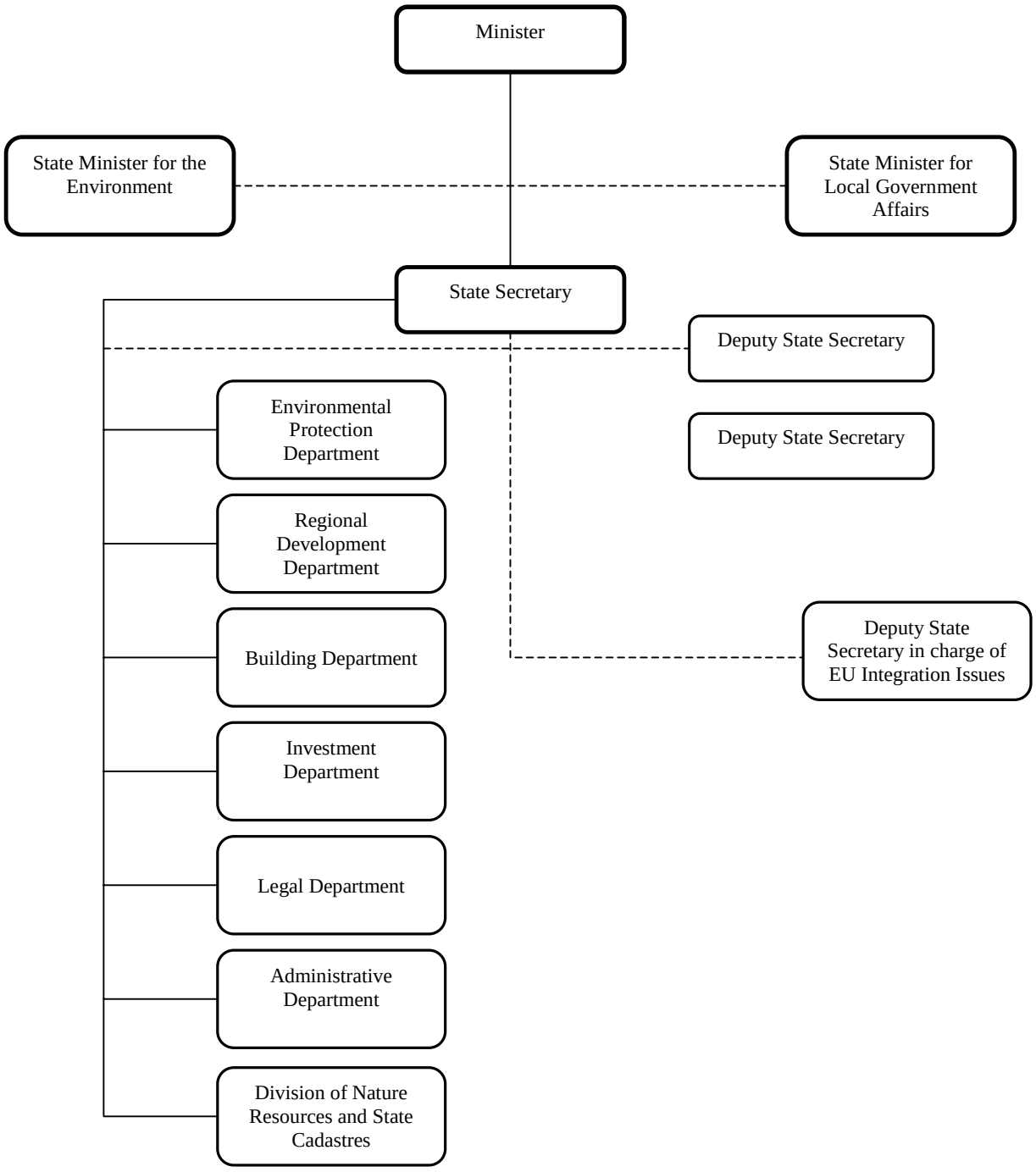
- organizing the collection, transport and disposal of non-hazardous municipal wastes, and
- organizing the water supply and waste-water treatment.

The Environmental State Inspectorate

The Environmental State Inspectors control environmental protection and the use of natural resources. The Environmental State Inspectorate (ESI) is a central MEPRD institution, consisting of substantive divisions for instance for water, air, mineral resources, flora and fauna, hazardous waste and chemicals as well as radiation protection and nuclear safety. It conducts around 1 500 inspections per year. The central State Inspectorate:

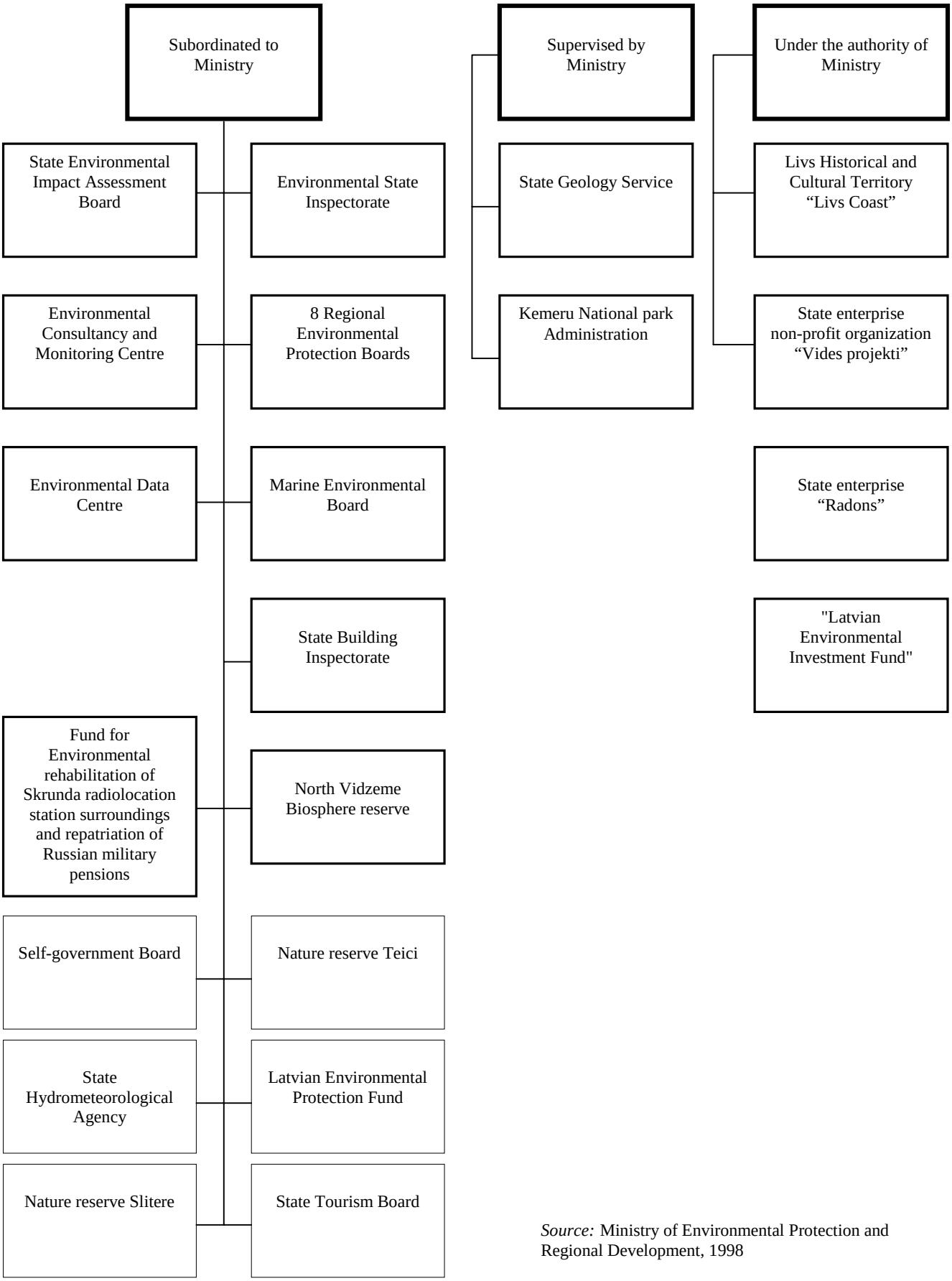
- prescribes methods,
- provides training and seminars,
- conducts inspections, either jointly with the REB inspectors or independently,
- is the lead coordinator for combating spills and explosions.

Figure 1.1: Structure of the Ministry of Environmental Protection and Regional Development



Source: Ministry of Environmental Protection and Regional Development

Figure 1.2: Institutions under the Ministry of Environmental Protection and Regional Development



Source: Ministry of Environmental Protection and Regional Development, 1998

According to the Regulations on the Statute of Environmental State Inspection, cooperation with State and municipal institutions, public organizations and other relevant institutions is required.

The REB inspectors, who work on the regional level, carry out several thousand inspections per year. The REBs mainly

- develop inspection plans, and
- conduct inspections, either jointly with the State Inspectorate or independently.

The regional inspectors do not report to the central Inspectorate but to the REB Directors. Thus, the central Inspectorate has no direct control over the regional inspectors and often is not even informed about their activities. Moreover, the duties and responsibilities of the central and the regional inspectorates are not always clearly defined. This can lead to a duplication of work when, for instance, the same case is examined at both levels.

This problem does not exist for hazardous waste, chemicals, radiation and nuclear safety inspections, as the State Inspectorate is fully in charge. The main duties of the radiation and nuclear safety inspectorate comprise:

- licensing, granting permits and supervising radiation problems and nuclear safety;
- supervising the transport of nuclear and radioactive materials;
- giving early notification of nuclear accidents; functioning as contact point;
- organizing a State accounting and control system for nuclear materials;
- organizing and updating the State's database of radioactive materials and sources of ionizing radiation;
- advising regional radiation safety inspectors and coordinating their work, and
- cooperating internationally on radiation and nuclear safety.

1.4 Ambient standards and quality

The majority of Latvia's environmental laws and standards are still based on the old Soviet regulations and are generally stricter than those of the EU – although not necessarily enforced. Environmental quality standards, according to Article 18 of the Law on Environmental Protection, are supposed to restrict the negative influence of economic and other activities on the surrounding environment. The minimum air and water qualities are translated into limits on, for instance, certain hazardous substances. Sectoral legislation lays down quality standards, like the Water Use Permit Regulations and the Law on the Protection of the Air. There are several hundred air and water quality standards. MEPRD is currently reviewing the water quality standards for a large set of pollutants. This is partly motivated by Latvia's need to pave the way for integration into the EU.

Closely connected to environmental quality standards are anthropogenic load norms and limits, regulating the maximum allowable loads from anthropogenic sources to the surrounding environment. Finally, emission standards directly regulate the discharge of substances (volumes and concentrations, Art. 19, Law on Environmental Protection). They are primarily used for point sources.

Moreover, there are limits on the total use of natural resources (Art. 20, Law on Environmental Protection). It seems that in practice such limits are used only for fish resources, through restrictions in the Law on Fishing.

1.5 Permitting system

Permits - for air, water and hazardous waste - are issued according to the respective sectoral laws: the Law on the Protection of the Air, the Water Use Permit Regulations, and the Law on Hazardous Waste. Permits for hazardous wastes are issued by the municipalities, the others by the REBs.

The permitting procedure starts with an application by an enterprise to the respective Regional Environmental Board. The application contains a variety of information, including data on the characteristics of the enterprise's activities, their effects on water and air, and also their waste streams. The REB reviews the application and specifies a set of limits for discharges and/or extraction which should ensure that ambient quality standards are respected.

Emission limits for enterprises are calculated using manuals prepared by different technical committees of the former Soviet Union, relating ambient concentration levels to pollutant loads. However, it is common for limits to be negotiated between enterprises and REBs, and in view of the difficult

economic situation enterprises face, a considerable degree of flexibility can be noted.

Both air and water permits contain mostly limits on daily/annual loads of pollutant emissions (tonnes per year). Permits also contain limits on concentrations of pollutants in waste streams (for water pollutants) and emission rates for pollutants, e.g. grams emitted per minute (primarily for air pollutants, but also for water pollutants). In some cases, the permits specify seasonal, and even monthly, variations in the limits. They thus restrict the "time profile" of pollutant releases into the environment. Permits currently being issued are typically valid for one year, and must be renewed thereafter. In the past, limits were issued for up to five years, and some of these permits are de facto still in force.

Latvia is planning to introduce an integrated pollution prevention system step by step. Currently, an integrated licensing system is being tested in the city of Ventspils, where many industrial and port enterprises are located. MEPRD sees the integrated pollution prevention and control (IPPC) licensing system in Ventspils as a pilot project and is looking forward to exploring jointly with the municipality of Ventspils the possibilities for improving the current system. In addition, a Danish EPA Project to Assist Latvia in its Approximation to EU Laws concerning Industrial Pollution Prevention and Control and Environmental Management of Industry, which started in early 1998, will cover the transposition and implementation of the EU Directive on IPPC.

The goal of this Directive is to prevent or, where that is not practicable, reduce emissions from industrial facilities to air, water and land. It includes measures concerning waste, thereby complicating for instance the substitution of one form of pollution for another. It covers activities with a high polluting potential, especially across frontiers. The activities of SMEs are largely left out of the IPPC Directive. The activities covered by the Directive require a permit. Either a single permit is issued for releases to air, water and waste from an industrial facility, or multiple permits are integrated through a cooperation procedure involving several permitting authorities. The permits must include emission limit values for pollutants based on the application of the best available techniques (BAT), taking into account the potential for transferring pollution from one medium to another. They must also contain measures to meet the following basic requirements:

- all appropriate measures are taken against pollution, based on BAT,
- no significant pollution is caused,
- waste production is avoided,
- energy is used efficiently,
- accidents are prevented, the consequences of any accidents that do occur are limited,
- after the cessation of activities, the necessary measures are taken to avoid any pollution risk and return the site of operation to a satisfactory state.

Additional requirements to protect soil and groundwater and manage waste are to be laid down as necessary. In addition, permits ought to contain the supplementary requirements necessary to prevent breaches of any environmental quality standard. Permits should be reconsidered periodically and updated when necessary. EU members have to apply these requirements to new installations from October 1999 and to existing installations from October 2007.

1.6 Environmental impact assessment

Scope and functions

The assessment of environmental impacts continues to be regulated in the Law on State Ecological Expertise of 1990, which was supplemented by internal administrative instructions in 1993. The Law applies not only to individual, potentially harmful projects such as factories, roads, and many other constructions and installations, but also to such strategic matters as pre-planning documentation (e.g. State programmes) for economic and territorial developments, planning and research materials, new technological developments, etc.

The expertise provides information on the state of the environment and natural resources, and on the possible impacts of proposed activities, plans, etc. According to Article 3 of the Law on State Ecological Expertise, the main goals are:

- to determine whether the level of potential environmental hazard of a particular economic or other activity which directly or indirectly affects, or in the future may affect, the surrounding environment or public health or living conditions has been correctly evaluated;

- to evaluate the environmental impact of the planned activity;
- to evaluate the permissibility of the economic activity, taking into account environmental restrictions.

This includes physical, chemical, biological and aesthetic pollution of the environment as well as the technological level of the project.

The expertise not only serves to provide information; it has stronger legal implications. According to the Law, a positive expertise is a prerequisite for any industrial project. Without it, the project cannot go ahead. In practice, projects are rarely halted. If, in the course of the examination, it seems likely that the project cannot be realized as planned, alternatives are discussed.

Only State Environmental Expertise findings have legal standing and are binding. Any other assessments or related findings, analyses, prognoses, and recommendations, regardless of their professional quality, are not binding and may serve only as background information.

Procedure

Assessments are carried out by State Ecological Expertise Boards, at either the central or the regional level. Expert commissions - including, as appropriate, specialists from MEPRD, inspectors, experts from scientific institutes in Latvia and abroad - are appointed to carry out the actual assessment. For projects of national importance such as certain big individual projects like factories, roads, gas pipelines, etc., the State Ecological Board, i.e. the central level, is responsible. This Board consists of three divisions: (1) technology and environmental protection, (2) construction plans, and (3) complex impact assessments. The Board is subordinated to MEPRD but independent when carrying out the expertise. MEPRD, however, has to approve the State Ecological Expertise.

Some, typically less complicated, assessments are carried out at the regional level by a special division within the REB, the Regional Ecological Expertise Board. Depending on the size, scope, location, financial support, etc. of a project, the procedural steps may differ and be more or less complex.

The process may be initiated by any physical or legal person, association, or social organization, or by State agencies. Normally, the assessment process is initiated in connection with an application to build or to develop land, and information has to be provided according to the respective laws. The developer has to submit, at his cost, the necessary documentation. In this first, preparatory phase, the Expertise Board determines on which issues information is needed, and in which detail, and gives instructions on the content of the project documentation.

Although the Law does not explicitly provide for a screening process, it can be decided not to undertake a complete assessment in cases where it is not deemed necessary from an environmental point of view. In certain cases, the authorities can decide not to initiate an assessment, provided the applicant accepts certain environmental conditions.

The actual assessment - the principal stage - is then carried out by the Boards or the experts who have been appointed. This is an important difference compared to most foreign EIA legislation where the principal responsibility for the assessment lies not with the Board but with the developer. The experts examine whether the project complies with existing legal norms, the information is accurate, the analysis of the influencing factors and their environmental impact and the proposed activity's impact on the environment is comprehensive, engineering and technical specifications are complied with in a manner which minimizes the environmental impact, and provisions are made for the storage and disposal of industrial by-products and waste.

Public participation is promoted in the assessments but there are no precise obligations to arrange for hearings in certain situations. The expertise process, normally not exceeding three months, results in a report with a decision. The commission of experts discusses the individual assessments and works out a joint decision together with the government representatives. The decision must include the individual expert's evaluation of specific questions, the report of the Board on the conclusions submitted by the experts, and recommendations to the developer. If necessary, a special statement, a so-called 'ecological task' for further handling the project, is written. This 'ecological task' lists the mitigation measures or other special demands that are obligatory for the realization of the project.

A report by the central Expertise Board is submitted to the MEPRD for approval, a report of

the regional level to the director of the Regional Environmental Board. The Law on Ecological Expertise does not provide for appeals against the assessment report, the decision is "final" (Art. 16). Only Parliament may demand a second assessment.

Law on Environmental Impact Assessment

The new Law on Environmental Impact Assessment was adopted on 31 August 1998. It harmonizes the Latvian assessment system with the EU system. The EIA procedure remains obligatory but the final decision has only the character of a recommendation.

The Law includes a screening procedure based on a list of activities - corresponding to the EC Directive - for which an EIA is required. However, the authorities may ask for an EIA even if the planned activity is not explicitly listed. The Law improves the rights of the public to participate in the procedure, with public hearings and the possibility to comment on the planned activity. Moreover, the content of the EIA is specified in detail, as well as the information that the developer has to provide.

1.7 Enforcement

According to the Law on Environmental Protection, the main institutions responsible for control and enforcement are the Inspectorates that control the compliance of environmental legislation in different sectors. The rights and duties of the environmental State inspectors are extensive; they are entitled to:

- control compliance with environmental legislation except in certain military areas,
- arrest persons who violate the legislation and hand them over to the police or municipal institutions,
- inspect the private property and transport vehicles of violators, and confiscate illegally obtained products and evidence,
- suspend or prohibit illegal activities in nature reserves,
- suspend, interrupt and prohibit illegal activities and revoke illegally obtained or used permits (e.g. for discharges to air or water),
- take legal action against violators for compensation for environmental damage,
- request information from physical and legal persons on environmental protection and the use of natural resources which is necessary for the work of inspectors.

The main function of the Law on the Procedure of Termination of Activities of Enterprises and Organizations is to empower State authorities to terminate or suspend the activities of an enterprise that has violated environmental legislation. The decision to terminate or suspend is taken by the environmental protection inspectorates. The termination or suspension procedure normally starts with a written warning from the Inspectorate. In 1997, 24 such warnings were issued, as compared to 18 in 1996 and only 9 in 1995. No enterprises have yet been closed down, but operations were temporarily discontinued in 14 cases in 1995, 3 in 1996 and 9 in 1997. MEPRD may revoke such decisions according to the Law on the Procedure of Termination of Activities of Enterprises and Organizations if they are unfounded. The Law does not provide for appeals to a court but the Parliament can, in turn, revoke a decision of MEPRD.

Moreover, administrative fines can be imposed as specified in the Law on Administrative Violations of 1984. In addition, provisions of the criminal law as well as disciplinary measures can apply. Typically, the administrative penalty is very small, less than 50 lats on average. For example, the Daugavpils REB imposed as many as 268 administrative sanctions in 1995, but the average penalty collected was less than 20 lats.

1.8 Liability

Persons who violate environmental laws are subject to administrative liability, criminal liability, and disciplinary or other liability in accordance with Article 48 of the Law on Environmental Protection. Inhabitants have the right to receive compensation from natural or legal persons for damage done to their health, life, interests or property by any environmentally harmful activity or inactivity. Requests for compensation before a court are free of charge (Art. 15, Law on Environmental Protection).

The fact that somebody has been held administratively, criminally or disciplinarily liable does not release this person from the obligation to compensate financially for damage. This obligation means, first of all, that the damaged area should be restored. If this is impossible, the violator has to compensate the owner, or transfer compensation to Latvia’s Environmental Fund if State or municipal property is affected (Art. 52, Law on Environmental Protection).

Sectoral legislation contains specific requirements for the restoration and financing of environmental damage. If possible, the damage is calculated according to certain definite tariffs (rates) and approved methods. Such legislation exists only in certain areas (fish, animal, and forest resources). If such tariffs and methods have not been developed, the damage is calculated according to actual (real) expenses (costs) in the procedure set out in the legislation (Art. 53, Law on Environmental Protection).

There is no specific legislation on environmental damages. The 1922 Civil Code (restored in 1993) applies, but it is not designed to tackle the specific problems connected with environmental damage - such as the establishment of a causal link between activity and damage. The Civil Code recognizes strict liability only with regard to especially dangerous situations, involving, for instance, vehicles, factories or dangerous substances.

The former military sites of the Soviet army are a special problem. They would need an environmental clean-up operation. In the agreement on the withdrawal of Soviet troops, Latvia waived any possible compensation claims. Therefore, these sites were not cleaned up and no compensation was paid. Nowadays, the Latvian Government is trying to help those persons who are interested in buying or taking over the land. The price of the land is very low and, in addition, "tax holidays" can be granted. Moreover, the Ministry of Defence organizes clean-ups of sites by military personnel as part of their practical training.

There is no compulsory ecological insurance scheme. Although Article 24 of the Law on Environmental Protection foresees obligatory ecological insurance for physical and legal persons whose activities are dangerous to the environment or may negatively affect the environment and people's health, such legislation has not been enacted.

1.9 Approximation process

Latvia applied for EU membership on 13 October 1995. Its application was partly discouraged by the Council of the European Union at its meeting in Luxembourg on 12 and 13 December 1997. The "Europe Agreements" between the European Communities (EC) and Latvia, negotiated and ratified in 1995, entered into force on 1 February 1998. They provide the legal basis for the relations between Latvia and the EU and aim to provide a framework for the integration of Latvia into the Union. This includes technical and financial assistance.

To assist the applicants from the countries of central and eastern Europe (CEEC) with the harmonization of their legislation, the European Commission set up the TACIS and PHARE programmes. Having first benefited from TACIS, Latvia now receives financial assistance from PHARE, through the DISAE facility. Between 1992 and 1997, PHARE provided ECU 161.6 million for Latvia, the annual amount having continuously risen. Apart from the EU support, Latvia has also accepted legal and technical assistance sponsored by the Swedish, the Finnish and the Danish Governments. It also received a World Bank grant of US$ 250 000 for air protection.

To set out the legislation which the applicant countries would need to transpose and implement in order to apply the *acquis* (known as Stage I measures), the Commission published the 'White Paper - preparation of the associated CEECs for integration into the internal market of the Union' (1995). Its target is to put rapidly into place legislation and regulatory systems, standards and certification methods compatible with those of the EU. The overall goal is to create conditions allowing the internal market to function properly after enlargement.

As a response to the White Paper and general strategy for its pre-accession phase, the Latvian Government, in December 1996, adopted the Latvian Approximation Strategy and Action Programme for EU Integration (Project LAT 103). This programme has been updated twice, most recently in the summer of 1998. To pursue its European integration, the Government furthermore established the European Integration Council, made up of the main Ministers concerned, which meets every month. This Council coordinates the implementation of the Integration Programme. The European Integration Bureau is the focal point for proposals for and implementation of integration initiatives. It is supported by 23 technical working groups. All draft documents submitted to the Cabinet of Ministers have to be examined by one of those working groups with regard to their EU compatibility. The Parliamentary Commission of European Affairs ensures the political coordination of the integration process.

MEPRD is responsible for the approximation of environmental laws and their implementation. It set up a special Integration Unit for this task. A crucial principle of EC legislation is the precautionary principle. It is embodied in the Law on Environmental Protection, mainly in terms of reduction of risk. Other principles of the EC legislation concerning the environment, namely the polluter-pays principle, the principle of access to information and the principle of solving problems at the source, have been introduced in other legal acts, e.g. the Law on Natural Resources Taxes and the Law on State Ecological Expertise.

From the standpoint of MEPRD, the revision of the National Environmental Policy Plan would not only clarify a number of strategic issues for environmental policy and management (see details in section 1.2), but should also be seen as a tool for the creation of a systematic cooperation and coordination network with other ministries and public institutions, as well as with all relevant non-governmental partners in environmental decision-making. In addition to reaching consensus with them on the necessary environmental policy perspectives and visions, quantified targets should be negotiated in the NEPP preparation.

The following detailed assessment applies to the Stage I measures of the White Paper that relate to environmental policy and management:

(i) Radioactive contamination of foodstuffs: the EEC and EURATOM legislation set conditions governing the import of agricultural products following nuclear accidents and other radiological emergencies. As Latvia's borders would, in the case of entry into the EU and its internal market, become (partly) an external frontier, the establishment of such an inspection and control system is of particular importance. In May 1998, a Regulation on control of radioactive contamination of foodstuff was published. It is fully in accordance with the EU Regulation EEC/90/737 and therefore fulfils the White Paper's requirements.

(ii) Radiation protection: being Stage I measures, EURATOM regulations lay down basic safety standards; define a system of reporting and procedures to authorize any activity causing ionizing radiation; and determine the supervision of radioactive waste shipments. As far as the authorization of activities in this field are concerned, the Latvian Cabinet of Ministers passed the Regulation on Licensing and Permitting of Actions with Radioactive Substances and other Ionizing Radiation in June 1996. This Regulation introduces the EURATOM legislation on safety standards into national legislation, as requested in the White Paper. Safety standards are established in the Law on Radiation Protection and Nuclear Safety (1994) and the Basic Safety Regulations on Protection against Ionizing Radiation, which date from August 1997. Also, a control system of nuclear materials has been established. A number of other regulations are already prepared and are on the agenda of the Cabinet of Ministers, e.g. the regulation on safe transport of radioactive substances. Once they are enacted, Latvia should be able to comply with the White Paper.

(iii) Chemical substances: the main directive is the so-called Dangerous Substances Directive (67/548/EEC), which aims at , harmonizing the classification of dangerous substances according to their risk, on the one hand, and setting up a system of labelling and classifying new substances, on the other. This Directive is complemented by more recent legislation to adapt it to technological progress. The classification of substances presupposes competent authorities. Since Latvia's laboratory methods are still those of the former Soviet Union, which differ from those used by EU member States, Latvia makes use of both PHARE assistance facilities and help from the Swedish Government. This includes exchange visits, training and technical assistance. According to the Integration Programme, the EU legislation on chemical substances must be adopted by the end of 1998. The Law on Chemical Substances and Chemical Products was adopted in April 1998. Due to the multitude of regulations and the technological procedures that have to be adopted, the harmonization requires further assistance to be achieved on time.

(iv) Control of risk of existing substances: the two Stage I measures indicated in the White Paper, Council Regulation (EC) 793/93 and Commission Regulation (Com.) 1488/94, deal with the evaluation and control of the risks of existing substances as well as risk assessment. Up to now, the management of risk has been handled at the municipal level. To establish uniform risk reduction strategies and to comply with the White Paper, Latvia accepted technical assistance from Denmark. The project, which started in 1998, covers industrial pollution prevention as well as control and environmental management of industries. A draft law on risk evaluation and risk assessment has been worked out with technical

assistance from the Finnish Government and is expected to be adopted at the end of 1998.

(v) Export/import of dangerous chemicals: Council Regulation 2455/92 (EC) on export and import of certain dangerous chemicals implements the UNEP 1989 London Guidelines for the Exchange of Information on Chemicals in International Trade. These Guidelines aim at providing third countries with a minimum set of information concerning dangerous chemicals. The draft regulation on classification was submitted to the State Chancellery at the end of 1997 and is expected to be adopted in the near future. No effective control system to supervise the export and import of foodstuffs has so far been established.

(vi) Environmental consequences of the deliberate release of genetically modified organisms (GMOs): the EU legislation, namely Directive 90/220/EEC, was designed: (i) to ensure adequate protection of health and the environment and (ii) to create an internal market for biotechnological products. To these ends, EU legislation determines the procedures for an EIA, the notification format as well as several adaptations to technological progress. Up to now, Latvia, although a signatory to the 1992 Convention on Biological Diversity, has adopted none of these regulations. Nor does Latvia have a competent authority to meet the requirements of the EIA. The Law on Environmental Protection does, however, foresee a permitting system for activities related to GMOs. Such a system would require a working EIA. Moreover, the Latvian Environment Policy Plan aims for the implementation of both the Convention's and the EU requirements.

(vii) Waste management policy: according to the White Paper, the whole legislative body concerning waste should be implemented as a Stage I measure. It should contain standardized definitions of such terms as "waste" and "hazardous waste". Furthermore, it should envisage the establishment of adequate administrative infrastructures to identify the different types of waste and their possible ways of treatment as well as to control and supervise waste management. Latvia has already introduced a number of regulations into its legislation. The Law on Hazardous Waste as well as the Regulation on Classification of Hazardous Waste and Criteria of Hazardousness, both dating from 1997, cover the EU legislation concerning hazardous waste and its shipment. Legislation on municipal waste has already been prepared and will be submitted to Parliament. Again, Latvia has accepted technical assistance from Denmark. With the help of the PHARE programme, Latvia is preparing the legislation for hazardous waste. According to the Government's plan, this legislation should be adopted for the most part by the end of 1998 and should be completed in 1999. Industrial waste, however, is not treated explicitly. Since little progress has actually been make, and since Latvia's timetable foresees full implementation no earlier than in the year 2010, industrial waste clearly constitutes the least developed field in Latvian environmental legislation. It is doubtful whether Latvia will manage to comply with EU norms in the near future.

(viii) Noise emissions from constructing plant and equipment: while the EU legislation covers only few types of machines (like lawnmowers), the Soviet legislation, which is still in force in Latvia, has a wider approach: it determines a permissible level of noise per area which is obligatory for all noise producers. In May, the PHARE project for the approximation of noise legislation started. It is to be finished by the end of 1998.

(ix) Air pollution - lead content of petrol and sulphur content of certain liquid fuels: as a reaction to the continuous increase in traffic, the EC has established limits on certain liquids. Since the EC is expected to further lower the permissible level, the Commission defined the harmonization of the existing levels as a Stage I measure. With support from the World Bank, Latvia is at present preparing a draft regulation on fuel quality standards, on emission limit values for combustion plants as well as on air quality standards. These regulations, which should be prepared by June 1998, fully comply, according to the Latvian Government, with EU legislation.

(x) Air pollution - volatile organic compounds: to control and reduce the evaporation from petrol resulting from the storage and distribution of petrol, the EU member States have to establish control measures, according to Directive 94/63/EC. Latvia has prepared environmental requirements for petrol stations that correspond to the EU norms, but they have yet to enter into force.

(xi) Ozone-depleting substances (ODS): going beyond the commitments of the 1987 Montreal Protocol, the EU has decided an earlier phase-out of ODS than the worldwide phase-out in the year 2030. Latvia ratified the Montreal Protocol in 1995. The earlier phasing out of ODS is mentioned

in the State programme "Phasing out ODSs". It will be introduced into Latvian legislation as soon as the Cabinet of Ministers approves the regulation on the protection of the ozone layer.

1.10 Conclusions and recommendations

Latvia's environmental legislation is steadily growing. The EU approximation process reinforces this trend. Some legislation stemming from its pre-independence days or from the period immediately after independence is already outdated. The relations between the different regulations are not always clear. Therefore, it can be difficult to determine which legislation applies to a specific case.

Recommendation 1.1:
The legislation should be reviewed and harmonized to avoid unnecessary conflicts and overlaps. This is especially urgent in view of the approximation process, which will lead to more new rules and regulations. The aim of explicitly confirming or revoking laws from the Soviet period should be pursued as a matter of priority for the sake of legal clarity and certainty.

The environmental legacy has been heavy in Latvia. Quite clearly this situation has enforced an apparent overall trend in environmental policy to deal with urgent environmental improvements on a project basis. The price that had necessarily to be paid for this very comprehensible strategic decision has been to postpone the development of environmental strategies. It appears that the overall outlook for environmental management can now become more balanced by paying more attention to coherent long-term environmental strategies. This can easily be achieved by upgrading the NEPP and NEAP.

Recommendation 1.2:
The work on the strategic dimensions of the National Environmental Policy Plan and the National Environmental Action Programme (NEAP), as well as their full elaboration and maintenance in accordance with initial plans, should be seen as a major and continuous task. When updating the plans, other ministries should be invited to participate in the discussions at an early stage. The participation of interested parties, industry, NGOs, etc. should be encouraged and formalized. The NEAP should be approved as a governmental programme, and not merely as a ministerial one.

One of the reasons why sustainable development does not play a more central role appears to be the lack of discussion between the MEPRD and other ministries which typically represent different interests, like agriculture, economy and transport. This lack might result from too little horizontal co-operation between MEPRD and other ministries. It seems that only the most important environmental policy aims and measures are discussed with other ministries. If possible, MEPRD formulates the activities and measures without actively soliciting comments from other ministries. The latter are rather informed about the results; comments are not really expected. The formulation of environmental policy would, however, benefit from comments based on considerations other than environmental ones. If other competent ministries were consulted systematically from the beginning of a project at all levels, and each ministry clearly represented its own interests, there would be more diverging views. A consensus within the Government on the basis of openly addressed diverging interests could perhaps best be approached through the formulation of a sustainable development programme. Also, other ministries should consult MEPRD on the possible environmental effects of their projects.

Recommendation 1.3:
There should be an intensive exchange of - possibly conflicting - views between the competent ministries, close cooperation from the beginning of a project, and consensual solutions in the formulation of which the principle of sustainable development could play its role.

Human resources are scarce, and much work has to be accomplished with few people. Therefore, it is crucial to have an effective organization not only within the Ministry but also with regard to the subordinated and supervised institutions, avoiding overlaps and increasing coordination.

Recommendation 1.4:
The organization of the subordinated and supervised institutions of the Ministry of Environmental Protection and Regional Development (MEPRD) should be changed. All - or at least most - should be merged into an environmental protection agency under the control of MEPRD.

At present, it seems that there is a lack of information flows between State and regional inspectors. This does not encourage cooperation,

which would help to structure and harmonize the procedures. Furthermore, as there is no hierarchical order between State and regional inspectors, there is no guarantee that provisions are interpreted in the same way in all regions. This problem bears no urgency as long as the regulations – e.g. standards dating from the Soviet period - are so precise that there is little room for interpretation. Particularly as a consequence of the approximation process and eventual accession to the EU, there will be more and more regulations that leave a considerable margin of appreciation and, therefore, an increasing need for coordination.

Recommendation 1.5:
Environmental issues should occupy a central place during the EU accession process. Special attention is required for issues such as (a) the elaboration of proposals for projects to be funded by EU programmes, (b) the accelerated implementation of EU directives if possible, and (c) the integration of environmental aspects into sectoral policies like agriculture, energy and transport to achieve harmonization with relevant EU practices.

It is important that there should be a clear and overseeable system of standards and limit values, and it is equally important that compliance with these standards should be controlled and enforced.

Recommendation 1.6:
The responsibilities between the central and regional inspectorates should be clarified with a view to avoiding both diverging practices between regions and a duplication of tasks. The central State Inspectorate should supervise the regional inspectors instead of the Regional Environmental Board Directors. The State Inspectorate should regularly receive information on the work of the regional inspectors so that it can harmonize their work and give appropriate guidance.

Issuing short-term permits gives REBs greater flexibility to revise the limits contained in them. However, it is unclear whether this flexibility is needed, especially in the case of enterprises whose emissions are typically below the limits. Moreover, administrative costs could be reduced – and the necessary flexibility kept - if the characteristics of an enterprise were taken into account when issuing the permit.

Recommendation 1.7:
There should be a more homogeneous system of fewer standards of common pollutants, which should be systematically enforced.

At present, Latvia has a single-medium permitting system for air and water. Such a system does not encourage a comprehensive solution to all environmental problems on the site. In this respect, an integrated permitting system would be preferable. Its implementation, however, requires adequately trained personnel, e.g. inspectors, and equipment. The necessary capacity building requires financial, technical and other resources. Therefore, as experiences in the EU member States show, such an integrated system is to be introduced gradually, according to the available training capacities and financial and other resources.

Recommendation 1.8:
The duration of a permit should be tailored to the characteristics of the enterprise. Permits valid for more than a year could be granted to enterprises whose emissions are inherently low or whose emissions have remained below the limits and are likely to continue to do so.

There seems to be a sufficient legal basis for an effective enforcement system provided that the inspectorates are restructured to increase their capacities and efficiency. But the credibility of the enforcement system is also influenced by the level of the administrative fines. To fulfil their function, these must be in relation to the seriousness of the violation. It should be more costly to continue the harmful practice and pay the fines than to change the practice. It appears that, at present, the fines are too low.

The liability provisions do not seem sufficient in all respects as there is no specific legislation with regard to environmental damages. Therefore, specific problems like causality, definition of damage, etc. are not dealt with. Moreover, it is unsatisfactory that the Law on Environmental Protection should provide for the establishment of a compulsory insurance regime that is not set up. If compulsory insurance is not desirable, this provision should either be revoked, or a different solution should be found.

Recommendation 1.9:
An integrated permitting system should be introduced step by step as soon as practicable. The integrated permitting system should be modelled on the IPPC Directive, gradually introducing its requirements.

Recommendation 1.10:
The efficiency of the present liability provisions should be reviewed. Strict liability should be introduced, in particular for activities that carry high risks and for the consequences of past environmental damage.

Chapter 2

TERRITORIAL PLANNING

2.1 Geographical context for planning

Regions and settlements

The historical regional division of Latvia can be used to describe the characteristics that are relevant to planning. Until 1939, Latvia was divided into four regions (*novadi*) - Vidzeme, Zemgale, Kurzeme and Latgale - and 19 districts (*aprinki*). Each of these regions has its own spatial, historical and social characteristics (See map of Latvia in the Introduction).

The *northern part of Latvia* (Vidzeme) borders with Estonia and the Russian Federation. This region has many historically significant sites like the towns of Sigulda, Cesis and Valmiera. It has a traditionally rural landscape. The region is home to a rather prosperous mixture of agriculture and medium-size industries. Latvia's highest hills are in Vidzeme. Near Sigulda there is the Gauja National Park, which is also a winter sports resort. The river banks of the Gauja and the Amata are part of the country's landscape heritage. A biosphere reserve has recently been established along the Salaca river in the north of the country. The Riga Bay coastline is marked by the north-south highway, which is known and developed as the Via Baltica. The Via Baltica is increasing cross-border traffic. There is a plan to widen the bypass around Riga. The Baltic coastline is treated as a special planning area with an integrated coastal zone management (ICZM) approach.

The historical cities of this region can probably finance at least part of their restructuring and renovation with income from tourism. Their main planning challenge is to reconcile development, cultural heritage and environmental protection. Coastline management and forest management are important issues. The river banks, with their sandstone cliffs, need strong protection. The Via Baltica gives access to many sensitive coastal areas.

The *western part of Latvia* (Kurzeme) borders with Lithuania, but equally important is its Baltic coast. The region has long established trading and fishing ports. Especially the town of Kuldiga, on the Venta River, and the Abava River valley have a rich historical and cultural heritage. The region developed rapidly when it was the western outpost of Imperial Russia. During the Soviet period, Ventspils was strongly developed as a major port, with pipelines to Russian oilfields. Liepaja was badly polluted during Soviet times. Port revenue is now used to improve the environment and renovate the city. These two cities, together with Riga, are the most polluted and environmentally problematic in Latvia. However, the coastline outside the cities was a closed military zone during the Soviet period, and this secured habitats for a wide variety of plants and animals. There are many small ports in the Kurzeme district that can be developed for tourism.

The city of Liepaja presents special planning and development challenges, because of its recent past as a closed military harbour area. The old city of Liepaja is surrounded by prefabricated housing estates. This rapidly deteriorating housing area strangles the development of the city and is already crowded. Another problem, which is typical of industrial cities in countries in transition, is the belt of outdated or obsolete factories and other industrial facilities. It surrounds the town, and sometimes comes very close to the centre. The land is often polluted and expensive measures to clean it up are needed so that it can be used for other purposes. The prospects of the Liepaja area changed towards the end of the eighties. Shortly before independence was restored, in 1988/89, a new general plan was developed. It became the basis for the Liepaja Development Action Plan. Its two main goals are to substantially rehabilitate the environment of the port area (focusing on the floating and disassembling of sunk submarines and other ships, treatment of polluted harbour water, and cleaning-up of oil contamination in general) and developing economic activity.

The *central part of Latvia* (Zemgale) borders with Lithuania. The Lielupe river is an ancient trade route with an inland harbour. Central Latvia has a long industrial tradition and produces a wide

variety of goods: pottery, cars, foodstuffs, etc. Jelgava, with just over 70 000 inhabitants, is an important transport junction. The area south of Jelgava to the Lithuanian border is Latvia's agricultural heartland, where the revitalization of farmland would need to be supported by spatial planning. Heavy cross-border technical and transport infrastructures, such as gas and oil pipelines and a railroad, run east-west. The international Via Baltica, which runs north-south, will rapidly increase road traffic and transport. These two corridors cross in central Latvia.

Jelgava illustrates another category of urban problem. Much of the town was destroyed in the war. The post-war architecture is monotonous. The town has a traffic-efficient grid layout with wide straight streets. The city's traffic accident figure is exceptionally high, so the most urgent urban planning and development problem in Jelgava and its surroundings is the road network.

The *eastern part of Latvia* (Latgale) has external borders with Belarus, the Russian Federation and Lithuania. This part is sparsely populated, hilly and has numerous lakes. The Daugava River Valley should be mentioned in this regional context. It extends from Riga south-east to Daugavpils. There is much traffic between these two big cities. Small-scale traditional industries are pottery and production of linen. Some towns like Ludza were rebuilt after being destroyed in the war, but there are many towns with historical castles and fortifications. Rezekne is an important trading centre and a traffic hub. The main centre of eastern Latvia is Daugavpils. Its more than 120 000 inhabitants make it Latvia's second city. During the Soviet period Daugavpils and other district centres were widely developed as industrial towns.

The development prospects for the countryside are bleak. Without strong regional support measures, the areas outside the main transport routes will probably decline. However, there is potential for tourism, because of the landscape in general and the lakes in particular. Tourism development needs careful territorial planning because the lakes' ecosystems are very sensitive. The location of Rezekne as a junction between St. Petersburg, Warsaw and Ventspils railroads can be developed.

Over half the Latvian population lives in the seven largest cities, Riga, Daugavpils, Liepaja, Jelgava, Rezekne, Jurmala and Ventspils. The Riga Metropolitan Region dominates the settlement network. Latvia's cities are small by international standards. For instance, Daugavpils and Liepaja have around 100 000 inhabitants. The middle category, which includes Jelgava, Jurmala, Ventspils and Rezekne, has 40 000 to 70 000 inhabitants. The other towns have populations of 20 000 to 40 000. The population density in urban settlements – and the average living floor space per person are low compared with most European cities. In all size classes of urban settlements, outdated heating and sewage systems, as well as industrial processes, cause negative environmental impacts such as air pollution and noise. The number of traffic accidents is increasing.

The Riga conurbation

Riga's development was accelerated during the Soviet period because it was an industrial centre and a hub of rail and air travel. It also hosted the headquarters of many all-union administrations. During the Soviet period, Riga had a regularly updated master plan, for which the central all-union government provided expert input, but which was approved in Latvia. It had the force of law, but implementation was weak. The best implemented part of the plan was the "concrete collar", i.e. the prefabricated housing estates around the traditional urban structure. Families maintained and modified their homes according to their needs. The spatial pattern of the neighbourhoods (mikrorajons) included day-care facilities, schools and basic shops. Ecological or traditional urban location factors, such as microclimate, were not taken into account in the plans. Planning of the historical part at present benefits from much expertise, and investment funds seem to be available for renovation.

Riga cooperates with the neighbouring municipalities in the conurbation. There are discussions on international cooperation and EU funding for large-scale transport and traffic projects in central Latvia, mainly bypass roads for Riga and a railway bypass for Jelgava. However, the time frame and financing of these works are still unclear. Riga's public transport system is outdated and ineffective.

2.2 Territorial planning and development policies

Planning features

The country's administration and its development planning did not always relate to the same territorial structure. After the Second World War,

the country was subdivided into 44 administrative units, a figure that was reduced to 26 districts around 1960. These districts continue to exist today, each with a capital. Districts are divided into municipalities, of which 491 are mostly small rural units (pagasti), and 70 small towns and villages with roughly the same status and functions as the pagasti. The seven biggest towns (Riga, Daugavpils, Jelgava, Jurmala, Liepaja, Rezekne and Ventspils) are called “republican cities” and have the same administrative functions as the districts. In addition to these administrative units, 9 economic planning regions were created in the 1970s, which had, however, no administrative significance. Latvian planning experts believe that this accounted for the limited success that is generally attributed to this concept.

A law on the reform of the regional and local administrative division is being discussed at the moment. It will be implemented in three phases, each envisaged to last two years. During the first two years the municipal authorities consider whether or not they wish to merge, and if so with which other municipalities. The second period of two years should take the wishes of the municipalities into account, and should result in a new district structure, which would then progressively be put into place in the third two-year period. The programme is scheduled to start in 1998.

Territorial planning in principle occurs at all three levels of administration: national, district and municipal. In addition, ad hoc plans can also be drawn up for regions, and in line with local conditions. Regional plans can be made for an area extending beyond the boundaries of municipalities and districts, if and when either the Cabinet of Ministers or municipalities so decide. Few examples of regional plans exist at present. They may take precedence over or be subordinated to district plans, depending on whether or not the ad hoc region concerned extends beyond district boundaries. Local plans, on the other hand, can be necessary for very specific needs in a small area.

Independence and the ensuing transition process to a market economy have implied a considerable scaling-down of territorial planning. However, this change has affected the national level much more than the district and municipal levels. National plans being less popular under the present system of socio-economic management, interest focused early in the transition process on developing modern land management tools, like land surveying and land registration. As a result, imbalances have occurred in the ”system” of vertical territorial plans and, indeed, in planning activities. There is no law specifying national territorial planning practices, but one is in preparation. Consequently, for the time being, district and municipal territorial planning do not receive input or guidance from the national planning level.

Usually, territorial planning is closely interlinked with economic development planning. More or less specific 'economic prospects' can be a very important guide for territorial planners, who can anticipate the future space needs for different types of potential activities. An economic development strategy for the country as a whole would yield broad but important orientations for national territorial planning as well as for the economic development prospects of districts and municipalities. Latvia has no such strategy. Yet, it would greatly help meet both major objectives of territorial planning - the reservation of certain land and water areas for different development purposes and the definition or articulation of future needs, prospects and alternatives for development or protection.

Land privatization and physical planning

In the view of Latvian planners, the prominent feature of the recent land reform in the context of territorial planning was the independence of the two. By now this may have resulted in a number of incompatibilities between land use legislation, on the one hand, and physical planning, on the other.

The process of privatization of plots started with claims made either by previous owners or by other applicants. Specially created municipal land commissions had to decide whether to return land to its previous owners or to compensate them. The decision was to be taken in relation to municipal plans, but in practice the commission had a lot of leeway. If there were important development projects on the land, it was not returned.

This practice may have contributed to the gradual emergence of a list of land-use goals, with about 200 categories. This list is not translated, nor does it seem to be easily translatable into a traditional land-use classification. As a possible result, the planning legislation, using traditional land-use types, and the land legislation, cast in terms of land-use goals that are not compatible with land-use types, appear unharmonized. One consequence of this disharmony is that property taxes are not

linkable to land-use types, but to land-use goals, with the final decision on the goals being vested in the heads of municipal administration if the situation is unclear.

The land privatization process is far advanced. In rural municipalities the municipal land commissions have been dismantled, but they continue to exist in towns and cities. The remaining privatization decisions, in accordance with the above scheme, are now in the hands of district privatization commissions.

Legal foundation of the territorial planning system

According to the Constitutional Law on Human and Civil Rights and Duties (1991), it is the duty of every individual, the general public and the State to protect nature, cultural assets, landscapes, historic and architectural monuments and the environment. At the moment, there is no law on territorial planning. The Law on Environmental Protection of 1991 provides the MEPRD with a general environmental mandate to intervene in territorial planning.

A law on spatial development planning is under preparation. The draft law creates so-called development plans, which include both strategic plans and physical plans. This draft law was prepared in 1998. It has already been accepted by the Government and will now go before Parliament. At all levels, the relation suggested in the new draft between the development plan and the physical plan is hierarchical. The physical plan will be made according to the goals and priorities included in the development plan. Republican cities, districts and towns can prepare both strategic plans and physical plans, but these can also be united into a single document to save planning resources. Different time frames can be chosen according to resources. The State and municipalities can choose the type of plan that suits them best. However, plans will be binding once adopted.

The draft mentions national territorial development objectives. The main aim of territorial planning is to promote sustainable development. The draft also specifies principles of territorial development such as preserving natural, human and material resources, balancing economy and environment, using land rationally, and preserving nature and cultural heritage. Regional characteristics, especially in nature and culture, must be taken into account. Unfavourable regional differences should be reduced. Local initiatives and cooperation between municipalities and the central government are encouraged, as is coordination between Latvia and the regional development policies of the European Union. Environmental protection is strongly emphasized at all levels.

It is suggested in the draft that there should be a national economic development strategy and a national physical plan, which would be binding on the State, districts and municipalities. The national physical plan could have binding parts, which are adopted by the Cabinet. Areas of national significance**,** such as valuable agricultural and forest areas, major infrastructure, protected nature areas, and even the structure of urban settlements, could be included in the national physical plan. The MEPRD would evaluate and advise on sector plans as well as regional, district and local plans. It could also take decisions on procedural disputes about district and municipal plans, but not on matters of substance.

The Regulations on Physical Planning also came into effect in 1998. They do not require parliamentary procedures prior to implementation, and are being enforced. The 1998 Regulations revise those of 1994. The 1994 Regulations had to a large extent taken into account Danish, Norwegian and Swedish practices (except for the detailed plans included in the Danish planning system, which were not felt to be possible at that time in Latvia). There is a special section in the 1994 Regulations on the transition period. Municipalities had to evaluate all spatial plans and construction projects started before independence. They also had to decide on the duration of pre-independence plans, amendments and whether new plans were needed. If so, they had to make them by the end of 1997, or with a term agreed with the MEPRD.

The 1998 Regulations define planning instruments and procedures as well as the sharing of responsibility between the national, district and municipal levels. The hierarchical planning system covers all development, i.e. construction of private and public buildings as well as public infrastructure such as streets and other technical systems. Plans also cover landscaping and demolition. The 1998 Regulations are controversial with regard to both the need for many of the changes that they make to the 1994 Regulations and their enforcement prior to the adoption of the law that they will partly implement.

Laws and programmes with impacts on land use

The Law on Environmental Protection (1991) includes provisions on the competence of municipal governments in environmental protection and the use of natural resources. Some of these provisions can have an impact on territorial planning. The local government can, within its competence, allocate or take away land-use rights and settle conflicts between land-use interests. It can limit or stop construction work if the environment is threatened.

The Law on Environmental Protection contains provisions on protected areas and zones along the sea, rivers and lakes. The Law on Protected Belts (1997) establishes a 300-metre-wide land protection zone and a 300-metre-wide zone along the Baltic Sea and the Gulf of Riga. In addition, there is a strict regulation zone, which is 5 to 10 kilometres wide. There are also protection zones along rivers and lakes. Their aim is to prevent water pollution and to create ecological corridors for animals and plants.

Parliament approved the Law on the Ownership of Land and the Organization of Land Survey in 1991. Laws on land reform in both the cities and the countryside came into force in 1991. The Law on Specially Protected Nature Areas (1993) aims at establishing and maintaining protected areas and establishing management, supervision and registration systems for them. Nationally protected areas cover 6.8 per cent of the country (see more details in Chapter 8).

The National Environmental Policy Plan (NEPP) includes such goals as sustainable use of natural resources and landscape protection. The National Environmental Action Programme (NEAP) lists actions intended to implement the measures and goals set in the NEPP.

Institutional responsibilities and planning instruments

The central national actor in territorial planning is the MEPRD and Regional Development Departments in cooperation with the Environmental Protection Department. Regulations on both national and regional planning mention environmental protection and nature resource conservation as primary motives for central government intervention. Therefore, the territorial planning system can be used to promote the long-term policy goals mentioned in the NEPP and the NEAP.

In the area of territorial planning, the Regional Environmental Boards set the so-called 'ecological tasks' and control their implementation. By inspecting district and local plans as well as building permits, the Boards assess all construction that can have a significant environmental impact. The MEPRD prepares for the Cabinet of Ministers proposals for nationally significant nature reserves, national parks, regional protection areas, historical and other specially protected nature objects. The Cabinet then decides upon their territorial borders. There are also other actors on the central government level that are subordinated to the MEPRD and can intervene in territorial planning, for instance the State Ecological Expertise Board.

According to the 1998 Regulations on Physical Planning, the MEPRD is in charge of preparing national territorial planning for the whole of Latvia. As there is no national territorial plan yet, this is mainly a coordinating activity. It is intended to balance the proposals of local governments, on the one hand, and district and sectoral needs, on the other. Plans for republican cities are adopted as binding municipal regulations, as are district plans and the plans of smaller towns and rural municipalities (pagasti).

According to the 1998 Regulations, District Councils can decide on their territorial development plans as long as sectoral, regional, municipal and State interests are coordinated. They can accept both their development and physical plans. They are in charge of financing their planning work. State aid is available. The district plan is an integrating document. It should implement the goals of national (and regional, where they exist) plans. On the other hand, it should take into account local municipal interests. The plan is prepared by the Development Department and adopted by the District Council in an open meeting. It can be adopted in parts. Before its adoption at the district level, it is submitted for examination to the Regional Environmental Board of the MEPRD, which examines its compatibility with national and regional plans. Limbazi and Riga districts are the only ones to have drawn up a complete development plan.

At municipal level, a territorial development plan is made according to the planning principles and analyses of the municipality's present situation. It aims at supporting development targets and

includes an action programme to implement them. The municipality is also in charge of making a physical plan. Planning objectives are adopted by the Municipal Council (dome). The first draft of the territorial development plan is submitted for public discussion, entirely or partially. Then, it is submitted to the regional Environmental Protection Board for expert appraisal. New regional, district and national level plans trigger the evaluation of municipal level plans. On issues of lesser significance, the decision-making can be delegated to the chairman of the council or his deputy, provided the landowners have accepted the plan.

When the general development plan is in force, the municipal government is in charge of conventional detailed planning to guide and control building directly. Detailed plans include building lots, land reserved for housing, recreation and environmental protection zones, public buildings and spaces, protection of the architectural heritage as well as municipal infrastructures such as streets, etc. Local building regulations have to be in accordance with the detailed plan. Local governments can decide on, for example, locally important nature protection areas. However, they are responsible for the management and financing of these areas as well. Municipalities can establish alliances with other municipalities. Municipalities are responsible for the financing of planning. State aid is available.

2.3 Provisions for public participation

As mentioned above, the Constitutional Law on Human and Civil Rights and Duties stipulates that it is the responsibility of each individual, the whole society and the State to protect nature, cultural assets, landscape and the historical and architectural heritage. In 1994, a communication strategy for environmental protection and regional development was launched to raise public awareness. There was a survey on environmental attitudes to improve the relations between politicians, experts and citizens. Citizens have the right to transparent and reliable information on planning issues. Procedures for informing citizens during the territorial planning processes are included in the 1994 and 1998 Regulations on Physical Planning. Individuals or organizations have the right to lodge a complaint with the MEPRD within two months from a decision being taken on a plan.

Public information about municipal plans is well provided for in regulations, but does not yet function well in practice. Municipalities can to a large extent decide how public participation in the planning process should take place. Citizens can get information because the initiation of a development plan is published in local newspapers. Landowners receive information by post. Citizens and organizations can make proposals for the draft, which is publicly posted for four weeks. Every person or organization that has interests in the area can also order a copy of the detailed plan.

According to the Law on Environmental Protection, citizens can turn to the courts to appeal against administrative decisions and actions on such environmental decisions that ignore the rights and legal interests of citizens or their organizations. They are entitled to compensation if harm is done to their health, interests or property. On the other hand, if an area is defined as a unique or typical natural territory with special significance for the preservation of biodiversity, or exceptional scientific, aesthetic, cultural or recreational value, its designation as such does not require the consent of landowners or land users. However, they may receive tax relief or compensation for the loss caused by limitations on the use of land, or land deprivation or expropriation. (For further details, see Chapter 4.)

2.4 International cooperation

Latvia's territorial planning system is being developed at the moment, providing an opportunity for including innovative elements such as integrated coastal zone management, cross-border development zones and transport corridors, urban planning and environmental impact assessment. International cooperation plays a role in this effort. The Baltic Palette Project is an example of an innovative joint project in the Baltic Sea region. The Development Council of the Riga region (Riga, Jurmala and Riga District) works together with the capital city regions from Latvia, Estonia, Finland, Sweden, and the Russian Federation. Applications for financing are made to the EU TACIS, the PHARE/Interreg and the Interreg IIC programmes. The aim is a common strategy for development measures for competitiveness and sustainability. Latvia’s task is to develop the east-west corridor. The Regional Development Department played an important role in preparing Baltic Agenda 21.

The Tampere-Helsinki-Tallinn-Riga zone brings together regions from Finland, Estonia and Latvia. The zone will probably be extended to Lithuania, Poland and Germany. Coordination between the Interreg IIC and PHARE financing will be

improved. The zone concept aims at environmentally sustainable settlements and land-use reserves for nature protection. Regional planning know-how is shared, and sectoral experts are brought together. There will be land-use planning guidelines for the Via Baltica. There are also initiatives to start cooperation in urban planning.

The MEPRD has, in cooperation with Danish and Finnish ministries and on the basis of several pilot projects in different districts, produced Guidelines for Development Strategies (Riga, 1998). This booklet contains recommendations and checklists to connect territorial planning with development strategies, action programmes and financing. It is suggested that this interaction should take place not only on the district level but in municipalities as well.

2.5 Conclusions and recommendations

The balance is only gradually returning to Latvia's territorial planning system. The understandable resistance to over-planning immediately after independence meant that the elements needed for territorial planning to be successful were not developed on time. Therefore, activities in the near future should aim to restore the internal balance of territorial planning. This makes it necessary to re-create all the building blocks that would ensure the linkage for planning between all levels of administration. Only on this basis can territorial planning become a tool for harmonizing economic and environmental development by enabling all partners in the comprehensive development planning process to express their points of view and promote agreement on the aims of development.

Recommendation 2.1:
The apparent disharmonies within the hierarchy of territorial planning - national, regional, district and municipal - and between territorial planning, on the one hand, and economic development strategies, on the other, should be removed as a matter of urgency. This requires, in particular, the clarification of the territorial planning objectives, the specification of national economic development prospects, as well as of the instruments and resources needed for coordinating the two.

For 50 years, Latvia was integrated into the division of tasks in the former Soviet Union. The situation now is fundamentally different. Therefore, the draft law on territorial planning should be approved by Parliament as soon as possible. Regarding the national institutional situation, the Ministry of Environmental Protection and Regional Development was established by bringing together regional development and environmental protection issues. There are many agencies within the MEPRD set-up that collect information about the state of the environment, but this information does not seem to be put to optimal use in territorial and urban planning. Therefore, the opportunities for using existing data for spatial planning should be improved. This seems to be due mainly to a lack of resources, and not to training deficiencies.

Recommendation 2.2:
The approval of the law on development planning should be seen as a priority. If during the adoption of the law, it is felt that there is a need to revise the current Regulations on Physical Planning, the Regulations should be changed forthwith.

Territorial planning does not seem to be a top priority in Latvia's transition policies. Given the magnitude of the urgent economic and political problems, this does not come as a surprise. Many sensitive political issues, such as land policy implementation and administrative responsibilities, have to be solved before an effective planning system can be established. The benefits of territorial planning are often difficult to assess immediately, but mistakes in the siting of activities can have long-term effects. Besides the economic, social and ecological long-term advantages of rational siting policies, it is possible to use territorial planning as a tool to alleviate the social and ecological impact of the rapid restructuring process itself. Physical plans should be realistic, and understandable to everybody. The central government has a special responsibility to provide guidelines, expertise and other means to local authorities. The municipalities and districts are often without sufficient planning and implementation resources. Also, the private sector should take responsibility, by accepting reasonable siting decisions. The most important thing is that the territorial planning system should respond to all developments in Latvian society.

The MEPRD is aware of the possible role of land-use planning in a market economy, and its evolution within overall transition dynamics. The territorial planning system is therefore developing in a step-by-step manner at all levels of administration. It is seen as an important instrument for nature protection and environmental

management as a whole. However, while the organization of the planning system advances very adequately, the formulation of operational goals emerges as a more pressing need. Attractive goals like sustainable development and biodiversity need to be complemented by more concrete ones, such as restricting urban sprawl, effective use of infrastructures, etc. Another problem is that many provisions that have impacts on land use are scattered in too many different laws. One important and very concrete requirement in this connection is the development of a single land-use classification across all relevant legislation.

Recommendation 2.3:
The formulation of operational territorial planning objectives should complement the existing general goals. All legal provisions affecting land use should be integrated, on the basis of a single land-use classification. Strategic environmental impact assessment should be incorporated into territorial and land-use planning.

There are problems in the implementation of the Regulations on Physical Planning, partly because the results of the administrative reform are unclear. Municipalities are small, and so are the districts. Resources to implement plans are insufficient, if available at all. Territorial planning practices at present give a wide range of choices to planners at each of the different levels. However, this decentralization can produce incoherent results. Because of these problems, and a general lack of planning resources, almost all districts have only started their planning work.

Modern territorial planning strategies point out the importance of strong regional entities. In Latvia, the relationship between the republican cities and their surrounding districts seems unclear. The districts and municipalities seem to be too small to create effective regional strategies. The lack of an effective regional level can cause delays in cross-border cooperation, because the idea of pan-European territorial development is based on regions working together. The ongoing process of strengthening the regional level by encouraging cooperation between districts should be accelerated. During the planning process, most districts understood that they were too small, and have started to cooperate regionally. The central government should fully back this reform. There is a need for delineating new and fewer municipalities and districts. The respective decisions to be taken during the second phase of the ongoing revision of territorial units should be able to benefit from a clear and harmonized input from planning authorities. The planning authorities, and in particular the MEPRD, could prepare their input by drafting a full set of methodological instructions concerning planning as a priority.

Recommendation 2.4:
The structure of planning authorities should be reviewed, together with that of administrative authorities, from the point of view of optimal decentralization. The purposes and mandates of district planning should be delineated clearly, in particular in the seven "republican cities". The Ministry of Environmental Protection and Regional Development should focus priority attention on the preparation of methodological instructions for planning at all administrative levels and for the recognized purposes.

Many of the problems of post-socialist cities also exist in western Europe. Urban sprawl is a global problem, and the ever-increasing consumption of land and nature for building is not a Soviet-specific phenomenon. Prefabricated and peripherally located mono-functional housing estates cause problems everywhere. Another common problem is that entire industrial regions are becoming obsolete. On the other hand, historical city centres were often preserved in the Soviet system because centrally located land had no market value. This now creates an opportunity to strike a balance between the urban heritage and new well-planned development.

During the Soviet period, many central cities of districts became too big in relation to their surrounding areas. For instance, in cities like Jelgava and Riga, which are busy traffic junctions, it is necessary to integrate traffic policies into the town planning process more effectively. An integrated planning method is already being used in the Riga Region Development Strategy. On the regional level, there is a comprehensive development planning strategy for Zemgale. Urban planning and development could be finetuned to improve the present urban structure. In spite of successful examples like the Liepaja Region and Action Plan, there seems to be a need for a coherent national urban policy. The creation of a national urban policy could be started with a list of hot spots, for which development prospects ought to be clarified urgently.

The need for a new urban planning and management paradigm is recognized in Latvia. In the previous system, the government was

responsible for urban maintenance and services. Now the renovation and maintenance of the housing stock is the responsibility of the occupants or owners. However, this burden has proven to be too heavy for individual families even in many western countries. In Latvia, it seems to be very difficult to increase the expenditure of individuals on improving and renovating the deteriorating housing stock. This task should therefore primarily remain among the responsibilities of the national government, for which international assistance would certainly also be needed.

Recommendation 2.5:
Schemes should be developed to back urban planning and management, whereby national – and, possibly, international – support is provided to restore housing quality, preserve city centres and promote a more balanced urban development across the country. More active public land policy measures are needed.

The current situation of Latvia's environment, be it natural or built-up, is very much a result of its location on the Baltic Sea rim. This will continue to bring advantages and disadvantages to Latvia, which requires international cooperation in territorial planning and development issues. Its urban and rural environments have serious but not uncommon problems. These are basically caused by the difficult restructuring processes of the last decades. Market economies have had more time and money to cope with their restructuring processes. They have much experience with solving technical and policy problems. What makes the case of Latvia difficult, is the speed and depth of spatial transition.

The framework of the European Union provides a way to help Latvia integrate into the European spatial planning framework. The European Spatial Development Perspective (ESDP) could be extended to cover the Baltic States. The Visions and Strategies around the Baltic Sea (VASAB) has already been very useful for Latvia when it re-established its position on the Baltic rim (see Chapter 5). Assistance from the EU is geared mainly to transport infrastructure projects. There could perhaps be more assistance for careful territorial planning. Improvement is in sight, as the Interreg II C programme is targeted at territorial planning issues such as balanced settlement structures and coastal zone management. Latvia could perhaps attempt to benefit from this to develop its territorial planning system. The coordination of PHARE and TACIS programmes should be improved especially with regard to cross-border projects. In its EU accession strategy, Latvia should even better spell out the need of territorial planning as well as targets, monitoring and evaluation of projects. Latvia would probably find it useful to prepare a description of its planning systems according to the EU Compendium of Spatial Planning Systems and Policies.

Other international cooperation should be realistic with regard to the formulation of strategies, pointing out the importance of preconditions for implementation such as taxation, allocation of public expenditure, and especially land policy. International financial institutions emphasize long-term capital and technical assistance for private infrastructure projects. However, public infrastructure projects and housing play a key role in countries in transition and offer opportunities for employment. These require more territorial planning than what is now done. The international financial institutions could include more territorial planning issues in their policies.

Recommendation 2.6:
Attempts should be made to integrate territorial planning needs more deliberately and more extensively into Latvia's EU approximation strategy. If possible, Latvia should use more EU assistance for its spatial development programmes and projects.

Chapter 3

ECONOMIC INSTRUMENTS FOR INTEGRATION AND FUNDING OF ENVIRONMENTAL EXPENDITURES

3.1 Economic instruments for integration

The following economic instruments are available in Latvia for the integration of economic and environmental decisions:

- Taxes on land, mineral resources, and water use;
- Charges on the discharge of pollutants into water, air, and soil;
- Charge waivers (conditional on investment);
- Penalties for exceeding established resource use and emission discharge limits; for damaging the environment; for cutting trees without authorization, etc.;
- Product charges on batteries, packaging, luminescent lamps, and tyres;
- Refunds for taxed wastes that are recycled or reused;
- User charges for tap water, for sewerage and sewage treatment, and for municipal waste;
- Grants to undertake environmental training, education, feasibility studies, research, or to start projects;
- Excise and customs duties on fuels and cars;
- Subsidies to encourage the use of sludge from waste-water treatment plants in farming.

The authorities are also considering applying the following instruments in the short term:

- Environmental tax differentiation for leaded and unleaded petrol: the intention is to use the revenues to subsidize the road fees for cars that have catalytic converters;
- Energy taxation: based on the European CO_2 tax approach, an attempt is being made to take account of the sulphur content in fuels and induce energy price developments favourable to the environment;
- Support to voluntary programmes. The Latvian Packaging Association is carrying out a feasibility study. The idea is to agree on packaging standards, packaging flows and distribution networks and cost sharing;
- Pollution trading programme: transferable licences for air emissions and waste-water discharges; product import licences will be included in the programme.

Taxes on land and natural resources

The Land Tax Law (1990) provides incentives to promote a careful use of land. It prescribes a *1.5 per cent land tax* on the value of land. The Regulations for the Calculation of Land Value in Towns and Rural Areas prescribe procedures to calculate the land value. Land pollution can decrease the value of the land up to 20 per cent. The Law on Land Use and Survey (1991) includes provisions for the State Land Cadastre (land register). The Regulation on the State Cadastre of Real Estate (1996) determines the data and coverage. The State Land Service draws up the inventory and manages the cadastre. The cadastre is used for national and regional territorial planning (see Chapter 2), for environmental and cultural heritage protection, and for real estate inventory, valuation, and privatization.

The Land Tax Law provides for *tax relief* when the land and its resources cannot be legally used for commercial purposes. If the land is in a specially protected area, its owner might be exempted from the land tax. Land tax revenues are increasing (see Table 3.1)

The Law on Natural Resources Taxes (1995) obliges resource users to pay taxes for using natural resources and polluting the environment. The tax failed to have an impact on the behaviour of businesses and enforcement was limited. The 1996 revision (effective since January 1997) brought in new indexed tax rates, an emission tax waiver, product charges, and tradable licences. Simultaneously, the fiscal administration was also changed. The State Revenue Inspection became an environmental tax collector. Today, the Law on

Table 3.1: State revenues from taxes on nature resources, 1994-1998

Current prices

	1994	1995	1996	1997	1998 a/
Total revenue *(Million lats)*	**601.0**	**767.7**	**1 139.3**	**1 377.8**	**1 447.4**
of which from:					
- Forest income *(as % of total)*	*0.8*	*0.5*	..	..	..
- Excise tax *(as % of total)*	*4.9*	*6.7*	*7.7*	*8.7*	*10.1*
- Customs duties *(as % of total)*	*3.9*	*2.4*	*1.6*	*1.6*	*1.2*
- Land tax **b/** *(as % of total)*	*1.6*	*1.4*	*1.1*	*2.3*	*2.8*
- Taxes on natural resources *(Million lats)*	**1.6**	**1.5**	**7.3**	**17.5**	**24.3**
State Spec.Environmental Budget *(Million lats)*	1.6	1.5	2.9	7.0	9.7
Municipal Spec.Environmental Budgets **c/** *(Million lats)*	..	..	4.4	10.5	14.6
Share of taxes on natural resources in total revenue *(%)*	***0.3***	***0.2***	***0.6***	***1.3***	***1.7***

Sources: Economic Development of Latvia, Ministry of the Economy, Riga, June 1997;
Legislation on the Central Governmental Budget, Ministry of Finance, Riga, 1998.

a/ The estimates for 1998 are 1998 State budget figures.

b/ In 1997 land and property tax revenues were counted together;
in 1998 real estate and property tax revenues are counted together.

c/ Estimates based on legal provisions: 40 per cent of tax is channelled to Special State and 60 per cent to Special Municipal Environmental Budgets.

.. not available.

Natural Resources Taxes is Latvia's main law on economic instruments for the environment.

The following mineral resources are taxed (Annex I to the law): soil, loam, sand, moulding sand, sandy gravel, clay, dolomite, limestone, lime, travertine, gypsum, boulders, peat, sapropel and curative mud. Water as a resource is also taxed. The water rates are differentiated according to the source (ground, surface, or thermal) and to the use (medical or drinking water). The tax is calculated by multiplying the extracted amounts (including losses) by the basic rates specified in the Law's Annexes I and II. If established limits (see Chapter 1 for permits) for resource use were exceeded or the resource was extracted without a permit, penalties apply (for penalties, see below).

The tax proceeds from mineral and water resources are split between the Special State Environmental Protection Budget (40 per cent) and a special budget in the municipalities (60 per cent) where the resource was extracted.

The natural resource use tax is administered in the following manner: the resource user declares the resource use as part of his general tax return. The environmental inspectors verify the calculations and sign the completed form. The environmental inspector is responsible for the environmental part only. The State Revenue Inspection checks the amounts of the resource that were used and sold. Used energy resources are taxed according to the sulphur and/or carbon dioxide content.

Fish breeding and plant cultivation, fish transport and import are subject to a fee and a licence. The Law on Fishing (1995) requires those fees to be paid into the Special State Fish Fund. The fisheries have to replenish and maintain the fish resource.

Since 1996 (Table 3.1), the tax revenues from natural resources have increased from half a per cent to one and a half per cent of the State Budget (1998). In recent years, they have been channelled to the Special State Environmental Budget (accruing to the Environmental Protection Fund in Figure 3.1).

Since 1990, resource exploitation has more than halved (Table 3.2). Dolomite, clay, sand and gravel exploitation has diminished by some 90 per cent, that of limestone and gypsum has decreased more than 70 per cent, even exported peat has shrunk to

Table 3.2: Reserves and exploitation of selected mineral resources, 1990-1996

Selected resources	Reserves		Annual extraction of selected mineral resources							% change	Exploitation assessment
	Estimated	Recoverable									
	(Million of units)									*%*	*Number of years*
	End of 1996		1990	1991	1992	1993	1994	1995	1996	1990/91-1996	Based on 1996
Oil *(tonnes)*	125.0	..	..	..	..	..	..	..	..	..	..
Peat *(tonnes)*	410.0	340.0	1.173	3.380	0.781	0.411	0.753	0.540	0.596	-49.2	570
Limestone *(tonnes)*	550.8	134.2	..	1.284	0.587	0.127	0.413	0.324	0.367	-71.4	370
Dolomite *(m^3)*	661.3	183.7	..	3.861	1.008	0.421	0.320	0.409	0.429	-88.9	430
Clay *(tonnes)*	655.0	138.7	1.181	0.702	0.429	0.126	0.153	0.120	0.134	-88.7	1 040
Sand and gravel *(m^3)*	486.0	265.5	10.873	7.767	3.361	0.784	0.707	0.780	0.937	-91.4	280
Gypsum *(m^3)*	93.9	53.0	0.358	0.337	0.209	0.069	0.070	0.087	0.080	-77.7	660
Boulder *(m^3)*	..	0.6	0.010	**a/**	0.001	0.003	0.005	0.008	0.005	-50.0	120

Sources: State Environmental Inspectorate (on extraction data);
State Geological Service (on reserves);
State of the Environment Report, Environmental Consultation and Monitoring Center, 1996.

Notes:
a/ Not exploited.
.. not available.

50 per cent of its 1990 levels. The share of extracted peat exports increased from 14 per cent in 1993 to 22 per cent in 1996. Exports to western Europe dominate (peat exports to Germany doubled and to the Netherlands increased 5-fold).

The mining industries are going through thorough restructuring. They need to replace obsolete and energy-intensive technologies. As a result, several large resource-extracting enterprises were liquidated. Many pits and extraction sites were returned to their former owners. In 1993, inspection of 1913 extraction sites and pits pointed to inefficient management. Therefore, the data presented in Table 3.2 for 1991-1994 have to be interpreted with care.

Basically, the table suggests two inferences. Firstly, at the recent rate of extraction, reserves will last another century. Whether the pressure on the environment will increase because of exploitation will depend on the success of the mining industry's restructuring efforts. Secondly, the exploitation of mineral resources at current levels will not produce substantial revenues.

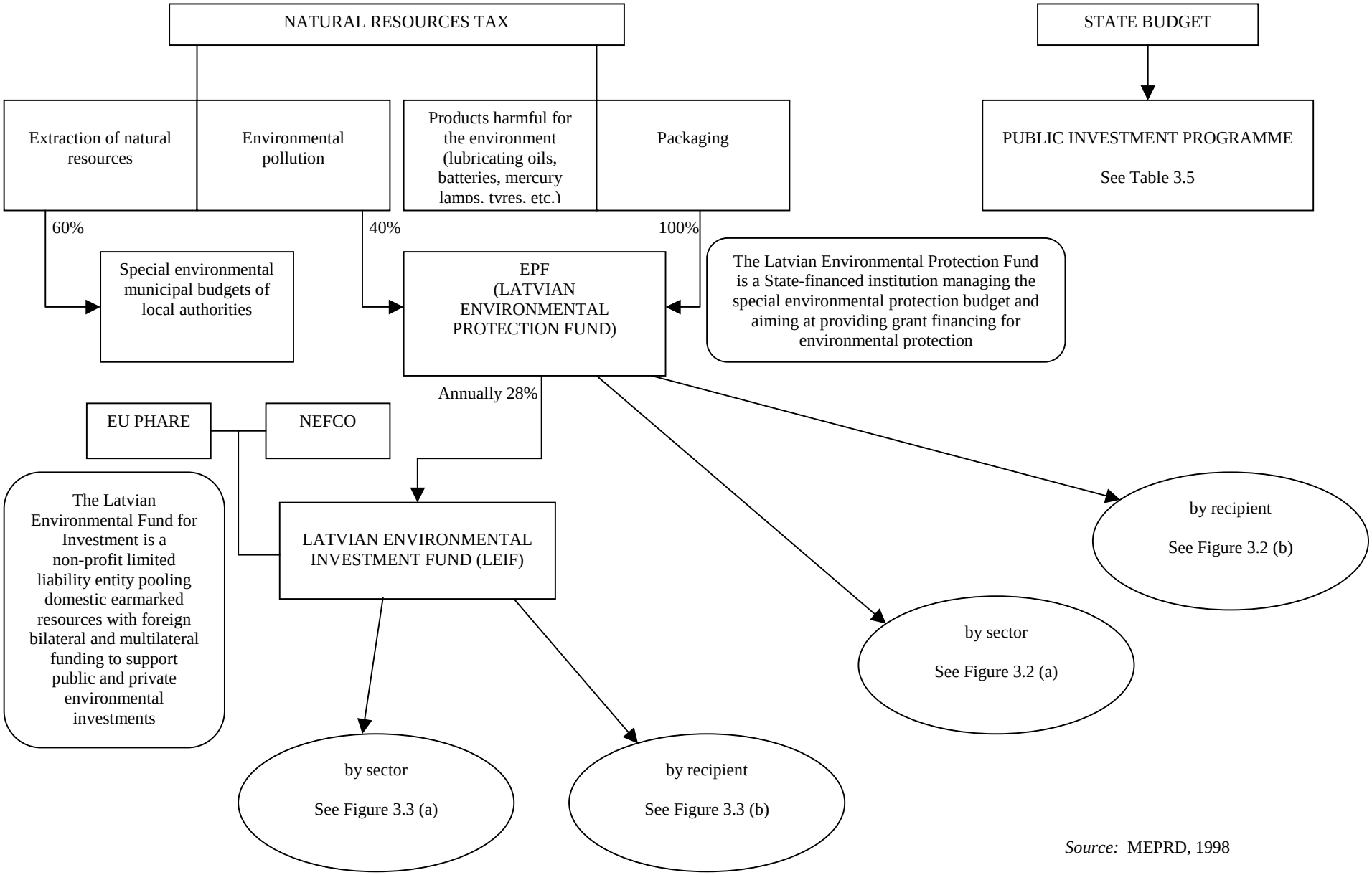
Pollution charges

The Law on Natural Resources Taxes stipulates that environmental pollution should be taxed. Appendixes 3 to 6 lay down rate schedules (for waste storage, air emissions, and water pollution, including pollution of groundwater).

The Regulations on the Order of Adaptation of the Norms of Nature Resource Tax (1996) prescribe a source-specific pollution limit: maximum permissible emission (MPE). The pollution charge is calculated per tonne of pollutant (for the permitting system, see Chapter 1). For emissions below the permitted limits, a basic rate, which varies according to the pollutant, is applied. A high rate is applied to pollution loads above the benchmark set in the permit.

The basic rate depends on the pollutant's toxicity. Chromium, cadmium and lead are considered to be particularly dangerous in water (basic charge is 50 000 Lats per tonne). Oil products are considered to be dangerous (8 000 Lats), and nitrogen, total phosphorus and COD generating pollutants are deemed to be moderately toxic (30 Lats). For air pollutants, heavy metals and their compounds are in the highly dangerous category (basic charge is 800 Lats per tonne), whereas SO_2, NOx, hydrocarbons and ammonia are in the dangerous category (10 Lats). CO pollutants fall in the moderately dangerous category (4.50 Lats), and dust is categorized as a non-toxic emission (3 Lats) (Table 3.3).

Figure 3.1: National Funding Mechanism for Environmental Projects



Source: MEPRD, 1998

Table 3.3: Basic charge rates for emissions of selected pollutants, 1993-1997

Lats per tonne

	Charge rates		Hypothetical charge rates, adjusted to inflation a/
	1993-1995	1996-1997	
Air pollutants			
Particulate matter (Dust)	1.0	3.0	3.4
Carbon monoxide (CO)	1.0	4.5	3.4
Sulphur dioxide (SO_2)	3.3	10.0	10.9
Nitrogen oxides (NO_x)	3.3	10.0	10.9
Volatile organic compounds	3.3	10.0	10.9
Hydrocarbonds (C_nH_n)	3.3	10.0	10.9
Heavy metals	3 250.0	800.0	..
Water pollutants			
Suspended solids	not taxed	10.0	..
Chemical oxygen demand	10.0	30.0	33.6
Total nitrogen	10.0	30.0	33.6
Total phosphorous	10.0	30.0	33.6
Oil products	2 500.0	8 000.0	8 403.4
Chromium	15 000.0	50 000.0	50 420.5
Cadmium	15 000.0	50 000.0	50 420.5
Lead	15 000.0	50 000.0	50 420.5

Sources: A.Ubelis, V.Seglins, A.Malik, "An assessment of Selected Policies for Controlling Stationary and Point Source Pollution in Latvia, HIID, Environmental Discussion Papers, No.23, July 1997;
Law on Natural Resources Taxes (1995), Annexes 4-5;
Macroeconomic indicators of Latvia, Central Statistical Bureau, quarterly bulletin, Number 2, 1997.

a/ Using the producer price index changes between 1993 and 1 January 1998.

The generally higher level of tax rates for water pollutants reflect concern about drinking-water contamination. Pollution rates are constrained by the decision of Parliament that environmental taxes must not exceed one per cent of total corporate taxes. In the opinion of several studies, and that of Latvian experts, the effectiveness of the pollution charge system is primarily due to the application of penalties.

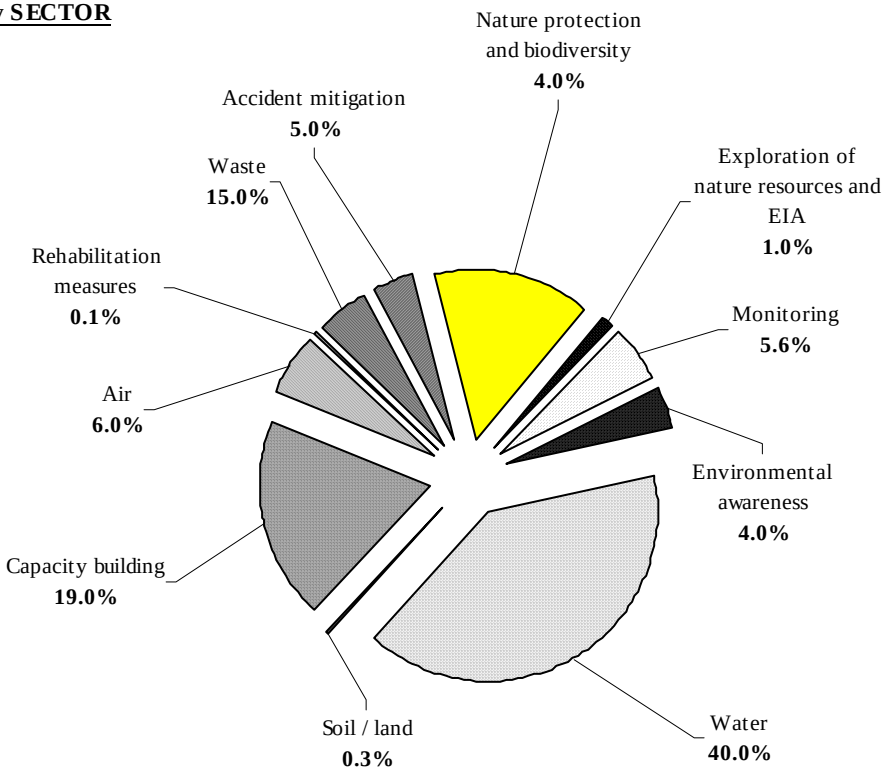
The pollution charges are not indexed, as indexation is prohibited by law. Thus, to increase the charge rates, the Law has to be revised (i.e. pass through the Government and Parliament). This gives a measure of certainty to the polluters who earmark funds for environmental improvement projects, however only in the short term. Table 3.3 indicates that the 1996 revision of the Law increased the pollution charges on average slightly more than threefold.

A penalty charge rate is applied when a limit is exceeded. It equals three times the basic rate, but the penalty is in effect bigger, because the payments for emissions below the limits are tax-deductible, whereas payments for emissions above the limits are not. The State tax authorities collect the pollution charges and transfer the proceeds to Special Environmental Budgets (Art.11): 60 per cent of the charges are paid into the Special rural and urban Municipal Environmental Budgets (SMEBs), and 40 per cent into the Special State Environmental Budget (SSEB) (Figure 3.1). The penalty charges are transferred to the SSEB (see also paragraph on extrabudgetary funds).

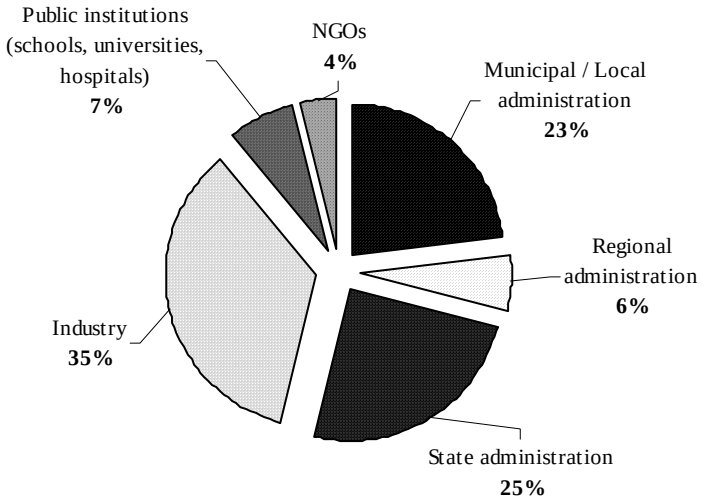
Table 3.1 provides an indication of the Environmental Protection Fund's and the special municipal budgets' receivables, and Figures 3.1 and 3.2 (a and b) show details about the receivables or payables in 1997.

Figure 3.2: Funding by the Latvian Environmental Protection Fund (LEPF), 1997

a- By SECTOR



b - By RECIPIENT



Source: MEPRD, 1998.

Charge on tax waivers

The pollution taxation includes an incentive called either natural resources tax credit or pollution tax waiver. Those companies that take measures to reduce emissions or natural resource use can apply for a grace period for the payment of the natural resources tax (pollution charges included) while they carry out their project. An annual allowance can be granted up to the total annual tax payments according to the base rates, if pollution is being reduced in the project. If the measures taken do not

reach the foreseen reduction of pollution, or if the project was not duly carried out, the 'tax credit' is converted into a loan at an interest rate equal to the refinancing rate set by the Bank of Latvia. The loan is reimbursable to the special environmental budget.

The emission charge and natural resources tax waiver is intended to promote investment in structural measures that reduce pollutant emissions and save natural resources. Switching to cleaner production technologies, installing end-of-pipe treatment, increasing recycling and saving materials qualify for such a waiver. The tax waiver enables an enterprise to enjoy the benefits that will eventually be generated by the pollution-reducing measure while the measure is still being introduced.

Applications for the waiver are filed with the Ministry of Finance and with each of the regional and local authorities that receive a share of the emissions charge revenues (60 per cent). To obtain a waiver, an enterprise has to meet certain requirements. Firstly, it must not have any outstanding tax debts at the moment of application, nor during the implementation period. Secondly, the enterprise must document the effectiveness of the proposed measure. Thirdly, the enterprise must ensure that its emissions do not violate the annual environmental quality standards specified by the MEPRD. If any of these conditions is not met, the waiver can be accorded partially or not at all.

The above considerations, the low charge levels, and empirical studies indicate that the waiver is designed for big industrial enterprises that heavily pollute the environment. The savings, however, are small even in absolute terms. They are even smaller for enterprises with lower emissions. Even if the savings do make it worthwhile for enterprises to incur the cost associated with obtaining a waiver, it is questionable whether they will be eligible. Industrialists do not consider the emission tax payments to be a pressing problem. For them, a major obstacle is the lack of knowledge regarding available measures for reducing pollution emissions. Enterprises lack the resources and the expertise to identify relevant measures and assess their relative merits.

Penalties and fines

Penalties for the illegal (unlicensed, unregistered) use of natural resources, for pollution without a permit (Chapter 1, on permitting system) or for the import or sale of goods without a licence, are twice the regular tax on top of the unpaid tax amount. Non-compliance with permit provisions can take a variety of forms: not obtaining a permit (a rare occurrence), not renewing a permit in time, not submitting self-monitoring reports, or under-stating emissions and associated tax payments. When REB detects non-compliance, it issues a written warning (Chapter 1, on enforcement).

Excess pollution can be fined in two situations. If environmental inspectors find evidence of unreported pollution, the polluter is liable for the fine described above. If an enterprise pollutes more than the permit allows, it pays the increased rate. The penalty and any fees for late payment accrue to EPF. The sanctions for the illegal use of forest resources and for damage to forests, and the fines levied by forest inspectors are paid into the Forest Development Fund.

Product charges and deposit-refund system

Latvia was the first Baltic country to introduce product charges. The revised Law on Natural Resources Taxes (1996) included relevant provisions. They are part of the natural resources tax and rates are specified (Appendix 7) either as a percentage of the sales/customs value, or in Lats per unit/kg. Mineral oils, batteries, ozone-depleting substances, luminescent bulbs, tyres, and packaging are affected. The proceeds from the sale or import of such environmentally harmful products and goods are transferred to the EPF (see Figure 3.1). The funds are transferred back to the licensed businesses that handle, recycle or reuse the goods in accordance with the technological and environmental protection requirements set by MEPRD. If an enterprise collects, handles, and recycles or reuses the goods/packaging, it gets a full tax refund. This allows new businesses to enter the recycling market. VAT is imposed on the refund and businesses also pay VAT when the good is sold. Excise duty is payable before VAT; therefore, domestic manufacturing, packaging and recycling has a certain advantage.

User charges

Municipal enterprises handle waste, and treat and supply water. Municipalities control the tariffs of water and municipal waste treatment. These tariffs vary from one municipality to the next. The tariffs appear to be based on the volume of waste water, and they differ substantially between corporate and residential users.

A substantial fraction of the waste water discharged by municipal plants comes from industry. Municipalities charge tariffs to the enterprises whose wastes they process. Enterprises may be able to effectively bypass emissions taxes on water pollutants by sending their waste water to municipal plants. According to 1995 data, municipal water treatment plants were the largest source of emissions, accounting for 80 per cent or more of all emissions (COD, total N, total P, and suspended solids). Many industrial facilities send their waste water to municipal plants where it is either wholly or partially treated before being released into bodies of water. These emissions are classified as emissions from municipal, rather than industrial, sources. In addition, such enterprises would not pay natural resources tax but charges to municipal plants according to the tariffs.

Grants and subsidies

The legal basis for grants and subsidies is found in the Law on Natural Resources Taxes and the Law on State Aid. Latvia has adopted a new law on State subsidies that is in line with EU directives on subsidies. Its Article 11 defines the State aid for environmental protection, improvement of energy efficiency and production of energy from renewable resources. The EPF is the most common source of grants for feasibility studies and research, or to start projects. Occasionally such activities are funded by foreign sources. When enterprises apply for a natural resources tax waiver to the Ministry of Finance, some funds could come from EPF to subsidize interest payments in the form of a grant to a project.

When new environmental norms are introduced, an enterprise that needs to comply might be eligible for a State subsidy. Such a subsidy has a ceiling, normally 15 per cent of the related investment. If the environmental measures are particularly effective, the ceiling could be raised to 30 per cent. In addition, the regions are differentiated according to their development need. In priority regions, the ceiling could be raised. If an enterprise takes its own initiative (not persuaded by the legal norm), the 30 per cent ceiling applies. The article also foresees a 50 per cent subsidy on costs related to environmental training and consultancy fees. These provisions are made for public campaigns related to environmental awareness and information, consumption of environmentally friendly products and the rehabilitation of environmentally damaged areas. Short-term operating aid can be granted for environmental purposes, but only in the limits of natural resources tax savings (see section on pollution charges).

Basically, the Law on State Aid repeats the provisions made by the Law on Natural Resources Taxes. Only small subsidies for sludge use in agriculture are granted at the moment. Environmental training and feasibility studies are also covered. In general, the aid aims to support competitiveness by mitigating additional externalities. It is temporary and regressive.

Excise and customs duties

The share of excise duty in the State budget's revenue is constantly increasing (Table 3.1). In 1998, the budget plans to collect more than 10 per cent of its revenues from this tax. Latvia's fiscal policy favours indirect taxes (VAT, excise and customs duties) over direct taxes. In 1994-95, Latvia moved away from progressive income and corporate taxes to a proportional schedule. In 1996, 56.5 per cent of the excise duty came from duty on fuels; the rest came from alcohol (33%), tobacco (8.6%) and other taxed products (1.9%). Part of the excise duty on fuels goes to the Road Funds.

To harmonize Latvia's excise tax rates with those of the EU, the 1996 amendment to the Law on Excise Duty (1995) established new rates for fuel. The duty on petrol rose from 0.04 to 0.10 Lats. Diesel fuel was also taxed. The Law on Excise Tax and Oil Products (13 November 1997) widened the base of the duty to fuel oil and natural gas and raised the existing rates (Table 3.4). Phasing in excise duty on fuels sends a clear signal to the markets, and they have responded: when the new duties were announced in mid-1996, businesses bought huge quantities of fuel in anticipation.

Latvia manufactures very few cars; most registered cars are imported. The Law on Customs Duties and Tariffs (24 September 1994) prescribes tariffs on vehicles according to their age and cylinder capacity and road taxes according to their weight. A new customs code is under preparation to meet EU requirements. The Ministry of Finance controls petrol quality.

3.2 Regulatory instruments

Licensing and licence market

The Law on Natural Resources Taxes (1995) has a full chapter on the introduction of licensing for tax purposes. Licences can be introduced for separate

Table 3.4: Excise duty rates on oil products, 1997-2001

	Excise duty rates on oil products (lats / 1 000 litres)					Annual change (%)				Total change (%)
	1997	1998	1999	2000	2001	1997-98	1998-99	1999-2000	2000-01	1997-2001
Unleaded petrol	120	140	160	180	200	16.7	14.3	12.5	11.1	66.7
Leaded petrol	130	160	190	210	230	23.1	18.8	10.5	9.5	76.9
Diesel fuel a/	80	100	130	160	170	25.0	30.0	23.1	6.3	112.5
Petroleum a/	80	100	130	160	170	25.0	30.0	23.1	6.3	112.5
Fuel oil *(1 000 kg)* **a/**	-	2	130	160	170	-	b/ 6 400.0	23.1	6.3	8 400.0 c/
Oil gas *(1 000 kg)*	-	10	131	50	70	-	b/ 200.0	66.7	40.0	600.0 c/

Source: Legislation on the Central Governmental Budget, Ministry of Finance, Riga, 1998.

a/ A special rate will apply after 1 January 1999:
- 13 lats per 1000 litres of petrol and diesel fuel, their substitutes and components; and
- 10 lats per 1000 kg of fuel, oil, its substitutes and components.

b/ Not taxed in 1997.

c/ Total change 1998-2001.

types or groups of natural resources and pollution within a certain region, for a specific type of entrepreneurial activity, and for the sale or import of goods and products harmful to the environment. Those different types of licences are valid only in the region and for the type of activity for which they have been issued. The Law is designed to protect regions where the environmental situation is deteriorating or where the environment's carrying capacity is exceeded and to discourage environmentally unfriendly businesses.

The licence fee equals the natural resources tax due for those activities for which the licence is envisaged. The total of all the licences belonging to the holder is considered to be the limit on the use of natural resources or environmental pollution. If that limit is exceeded, the user/polluter pays charges in accordance with the general provisions of the Law.

Such licences have to be issued by the MEPRD (or its authorized institution). Once issued they have to be registered within 10 days with the MEPRD authorized institution. According to the Law, these licences are potentially tradable. The market starts to operate when licence holders sell licences in part or in full because they no longer need them as a result of a change in technology or any other change. The Law stipulates that 'licences shall be sold at a price determined by agreement of both parties, however, not below the corresponding tax due for any pollution'.

For the system to start up, regulations are needed to specify the procedures for issuing the licences and making the payments and licence transfers. In addition, MEPRD has to issue legislative acts defining the different types of licences for the extraction of natural resources and environmental pollution. The authorities also have to be appointed by MEPRD. But so far there has not been any need for trade, and the actions prescribed in the Law have not taken place.

Standardization

The emerging Latvian national system will be harmonized with the system of European standards using voluntary standards in all areas, except requirements for the protection of human life and health, environmental friendliness and safety. The National Centre of Standardization and Metrology was set up to coordinate the standardization and measuring activities. In 1995, it became an associated member of the International Organization for Standardization (ISO) and the Comité européen de normalisation (CEN).

The procedure for developing standards accepted in Europe is also implemented in Latvia. 22 technical committees on standardization have started to work in such areas as: basic documents of the national standardization system, quality management and assurance, conformity assessment, information technologies, building materials, hazardous equipment, food industry and others. 130 European

standards were prepared for adaptation and reviewed in technical committees on standardization in 1997.

Latvia's national accreditation system was created in August 1994. The Latvian National Accreditation Office, LATAK, accredited, in compliance with EU standards, 61 testing laboratories and 2 product certification institutions to certify food products, cosmetics and toys, one staff accreditation institution to certify quality system managers and 4 inspection institutions to inspect hazardous equipment. In 1997, LATAK became an affiliated member of the European Cooperation for Accreditation of Laboratories (EAL). This will ensure that testing results and certificates issued in Latvia are recognized in EU countries. It also has bilateral arrangements, for instance with the German Accreditation Office, on wood and wood products.

Eco-labelling

The voluntary environmental labelling scheme began with the labelling of food products, establishing information requirements for labels of food products sold in Latvia, such as energy and nutrition values. Also, the first 14 (lesser-known) labels for 'environmentally friendly' agricultural produce have been issued (see Chapter 10).

Quality assurance, trade, environmental management

The National Programme of Quality Assurance (see Box 3.1) is part of governmental policy. Its objective is to create an infrastructure for quality assurance, including special training on quality management of personnel at all levels. The programme is expected to help Latvian products become more competitive and overcome trade barriers. The programme focuses on trade, in view of the requirements for accession to the EU and the World Trade Organization (WTO). It will establish a WTO Enquiry Point on technical barriers to trade, sanitary and phyto-sanitary measures, and includes the notification mechanism (EU Directive 83/189/EEC). The work is tied with international cooperation. The agreement to eliminate non-tariff trade barriers between the Baltic States was prepared and signed in 1997. It meets the guidelines set by the Baltic Council of Ministers (with a view to creating a Baltic customs union) and EU and WTO requirements.

In 1997, training programmes were held and materials published to introduce environmental management systems corresponding to basic EU principles and the ISO 14000 series. The non-governmental Centre for Standardization favours the introduction of ISO 14000 over the Eco-Management and Audit Scheme (EMAS). At the moment, Latvia's industry considers the ISO 14000 series to be a barrier to foreign trade and access to markets. Industry has just started a massive restructuring and total quality management is its prime concern, while environmental management systems are seen as a financial burden.

3.3 Financing environmental expenditure

The main sources of finance for environmental expenditure are budgetary and extra-budgetary funds, enterprises' own funds, and foreign loans and grants. The Latvian Environmental Investment Fund (LEIF) will join this list in the course of 1998.

Budgetary sources

Box 3.1: National programmes

The Government's national programmes deal with: (1) foreign trade, (2) quality assurance, (3) energy, (4) transport development, (5) public health and social security, (6) protection of the Baltic Sea environment, (7) regional development, (8) education and research, (9) construction, (10) development of small and medium-sized enterprises, (11) production and use of biological fuel, (12) information technologies, and (13) market supervision. This list might be supplemented or changed in line with the economic situation in Latvia or governmental policy. The programmes are short and medium–term, target-oriented programmes. In 1994, when this list was first drawn up, there were 10 programmes.

A number of these programmes are relevant to the environment. Firstly, the national programme on the protection of the environment of the Baltic Sea consists of several independent sub-programmes. For instance, project 800+ (improvement of the water supply and sewerage system in small and medium-sized settlements), Project 500- (collection of waste from settlements and improvement of waste storage), Helcom programmes, several joint projects, and a phase-out programme for ozone-depleting substances. The Helcom programme has three smaller programmes: (1) a national programme to decrease discharges of nutrients into the Baltic Sea, (2) a national programme to decrease the discharge of heavy metals into the Baltic Sea, and (3) international PLC-3 programme controlling companies that directly discharge effluents into the Sea. Within joint projects the improvement of water legislation, supported by EPA of Sweden, the joint project to create a monitoring of agricultural discharges, supported by Nordic countries, and coastal area management projects could be mentioned. The detailed development of the Programme required 84 500 Lats in 1996, and 114 000 Lats in 1997.

Regulation 129 of the Cabinet of Ministers (1995) on the Development and Implementation Procedure for National Programmes sets out the procedures for developing, financing and managing the programmes. It foresees that each national programme (see Box 3.1) is supervised by a ministry. To reflect current governmental priorities, the Public Investment Programme (PIP) was set up. Since 1995, environmental investments from the State budget have been channelled through the PIP.

The PIP is prepared by the Ministry of the Economy as the aggregate of infrastructure-related investment projects. The priority sectors are energy, transport, and the environment. The Government approves the PIP each year for a 3-year period. The PIP includes line ministries' and municipalities' plans and proposals. Each project/proposal includes an EIA statement. The Ministry selects projects according to the Environmental Finance Strategy, which is prepared annually by MEPRD.

PIP includes investment projects to be funded from the State budget, extrabudgetary funds, loans taken out on behalf of the State or with State guarantee, enterprises' own funds and grants. Till 1995, municipalities borrowed on the market, but now they borrow only from the Treasury, up to certain limits. The companies under privatization do not fall under the PIP. The latest PIP covers 1997-1999. The planning changes constantly. Only 46 per cent of the 1995 PIP was implemented, 38 per cent of the 1996 PIP, and 67 per cent of the 1997 PIP. As far as the environment is concerned, 54 per cent of the 1996 programme was carried out and in 1997 only 40 per cent of the funds were actually spent.

The priority sectors will receive 75 per cent of all PIP investments in 1998 (10 per cent of total PIP expenditure is allocated to energy, 42 to transport, and 22 to the environment). The PIP for environmental investments in 1998 earmarks 38 million Lats. By allocating funds to the environment, the PIP follows the investment priorities of the National Environmental Action Plan. The construction of waste-water treatment facilities receives the biggest share of funds (28

Table 3.5: Public Investment Programme, 1995-1998

	1995	1996	1997	1998a/
Total investments				
(Million lats, current prices)	**28.50**	**47.40**	**88.29**	**172.23**
of which, prior sectors:				
- Energy	0.1	7.9	13.1	17.8
- Transport	8.9	19.0	37.6	72.7
- Environment	2.7	8.9	14.5	38.0
as *share of total investments (%)*				
- *Energy*	*0.3*	*16.7*	*14.8*	*10.3*
- *Transport*	*31.2*	*40.1*	*42.5*	*42.2*
- *Environment*	*9.5*	*18.7*	*16.4*	*22.0*
Sources of finance				
(Million lats, current prices)	**28.50**	**47.40**	**88.29**	**172.23**
- Budget	13.84	14.30	23.34	43.37
- Loans	10.26	12.30	36.74	81.33
- Other b/	4.39	20.80	28.22	47.52
as *share of total investments (%)*				
- *Budget*	*48.6*	*30.2*	*26.4*	*25.2*
- *Loans*	*36.0*	*25.9*	*41.6*	*47.2*
- *Other b/*	*15.4*	*43.9*	*32.0*	*27.6*

Source: Ministry of the Economy.

a/ Plan data.

b/ "Other" includes grants, enterprises' own funds, and special budgets' resources.

million Lats in 1998, or 73 per cent of PIP environmental allocations). Waste management projects have also been included in the PIP. They will receive 9 million Lats (or 23 per cent of PIP environmental allocations). According to the Ministry of the Economy, the environmental part of PIP receives the highest attention from international donors. For 1998 alone, commitments reach 11.3 million Lats, including grants from the Environmental Protection Fund.

PIP almost doubles annually at current prices. Environmental investments are also increasing: this year alone 10 new projects are starting. The fuel projects are also financed by the PIP but within its energy sub-programme. The PIP aims to raise total environmental expenditure to 1% of GDP, also earmarking not less than 2% of foreign loans for environment. The 1998-2000 PIP is in preparation.

Extrabudgetary funds

According to the Law on the State Budget and the State Finance Management Law, the Special Budgets for Environmental Protection are earmarked funds for the environment (at national or municipal levels) and are adopted (revenues and expenditure) along with the budgets by the Parliament or Municipal Councils. There are many Special Budgets (see Box 3.2). The volume of the total budget equals that of the special budgets. The biggest special budgets are the Privatization Fund and the Social Security Budget. The other Special Budgets are relatively small. A special budget can spend only accumulated funds. Funds can be rolled over to the next year.

Before June 1996, an environmental fund collected fines and some penalties. Its revenues were 50 000-100 000 Lats. The Management Board of the Environmental Protection Committee managed the fund. The Ministry was established in 1993, and the fund was transferred to it. The current EPF started in June 1996. The Fund is managed outside MEPRD. The municipalities manage their own special environmental budgets. Now, EPF resources go to an account in the State Treasury. Fund management appropriates the expenditure. EPF manages different environmental projects (regardless of the initiator) and runs the tax-subsidy scheme for recycling. It can finance project initialization, public procurement, tenders, and support projects. Its first 20 projects were prepared in 1996. In 1997, the number increased by 300. In 1997, the EPF raised 7 million Lats (Fig 3.1), but only spent 4 million. Environmental, economic, financial and technical experts assess projects to be supported. In 1997, the Fund rejected 30 per cent of projects because they did not comply with environmental requirements. EPF subsidies were limited to subsidies to farmers that bought sludge from water treatment plants (per tonne and based on sludge transport costs).

Besides the EPF, there is the Latvian Environmental Investment Fund (LEIF). It has a completely different set-up. Loans will prevail in LEIF activity. According to national banking regulations, loans can be granted only by credit institutions. Thus, LEIF has to comply with banking requirements (such as capital adequacy ratios) and have transparent rules on granting loans. LEIF will start functioning in the second half of 1998. It will be subsidized by EPF (28 per cent of its allocations) and EU PHARE (see Figure 3.3a and b), while EPF generates funds from pollution charges, penalties, fines and product charges. The LEIF will institute soft lending (grace period 6-12 months, interest 3-5 per cent lower than the commercial rate, and loan maturity up to 10 years). Also, LEIF will develop the domestic ability for project cycle management and will help to implement full cost-recovery policies. The relationship between funds is complicated. For instance, the Municipal Development Fund receives grants from EPF if projects are related to the environment. The Fish Development Fund transfers 30 per cent of fines for illegal fishing to the EPF.

The Forest Development Fund collects the revenues (mainly stumpage) generated by the use of forests and their resources. There is no other tax on forests as a resource, even though forestry generates 25 per cent of Latvia's export earnings. The Fund uses revenues to finance reforestation. The money collected from damage to forest resources also goes to this Fund.

Foreign assistance

It is difficult to say to what extent foreign sources contribute to environmental expenditure. There is no transparency at the moment. Many institutions have recently been established and there is little coordination of reporting. Foreign contributions tend to come in two forms: technical assistance and investments.

Box 3.2: Special State and Local Government Budgets

The special budgets are made up of dedicated revenues not related to the basic budget and are intended to cover special expenditures. Their resources can only be used for these specific purposes. Special budgets include: (1) the Social Security Budget, and (2) the Special Health Care Budget of *the Ministry of Welfare*; (3) the Environmental Protection Fund, and (4) the Skrunda Radar Station Land Lease Fund of the *Ministry of Environmental Protection and Regional Development*; (5) the Road Fund, (6) the Port Development Fund, and (7) the Airport Fee Fund of the *Ministry of Transport*; (8) the Forestry Development Fund and (9) the Fishing Fund of the *Ministry of Agriculture*; (10) the Special Sports Budget of *the Ministry of Education and Science*; (11) the Special Cultural Budget of the *Ministry of Culture*; (12) the Special Budget of the *Radio and Television Council*; (13) the Central Housing Privatization Commission and (14) the State Property Privatization Fund of the *Ministry of the Economy*.

In 1998, special budget revenues are expected to be 633.4 million Lats, while basic budget revenues will be 647.4 million Lats. Most special budget revenues will come from excise duty, personal income tax and social security contributions. Special budget expenditures are expected to be 668.5 million. A significant part of special budget expenditure goes to subsidies and grants, which in 1998 are expected to reach 510.9 million Lats (or 76.4 % of all special budget expenditures). The biggest special budgets are the Special Health Care Budget, the Social Security Budget, the State Road Fund and the Port Development Fund.

The local government budgets also consist of basic and special budgets. Local government special budgets were instituted in 1996. The local government budget revenues in 1998 will be 341.2 million Lats (308.2 million Lats for basic budgets and 33 million Lats for special budgets). The main sources of revenue for local government budgets are personal income tax, land tax and property tax. 85.3 million Lats are targeted subsidies and grants from the central government budget. The most important special government budgets are the local government Road Fund, the Special Environmental Protection Budgets, and the Property Privatization Fund.

The local government Roads Funds, like the State Road Fund, receive revenue from the excise duty on fuel, as well as the annual fee for motor vehicles. The Law on the Excise Duty specifies that 50 per cent of revenues from the excise duty on fuel goes to the State Road Fund. The State railroad company is given 50 per cent of the excise tax on fuel that is used in railroad transport. Of the remaining part, 73 per cent goes to the repair and maintenance of State roads, while the other 27 per cent go to the local government Road Funds for repair and maintenance. Government regulations (1995) specify that the local government Road Funds also receive 30 per cent of the revenues from the annual fee for motor vehicles.

The local government Special Environmental Protection Budgets receive 60 per cent of the natural resources tax. According to the Law on State and Local Government Property Privatization Funds (1992), *the local government Property Privatization Fund* receives 60 per cent of the proceeds of the sale of State and local government residential buildings and the proceeds of the privatization of local government property (excluding residential buildings). Of the latter sum, local governments pay 10 per cent to the State Property Privatization Fund. If State-owned property is privatized, the city or parish local government where the property is located receives 10 per cent of the proceeds.

The Foreign Assistance Programme Coordination Department (since May 1997) at the Ministry of Finance handles technical and financial foreign assistance (including EU PHARE, multilateral and bilateral programmes). The Cabinet of Ministers has given the Technical Assistance Commission the task of coordinating the implementation of technical assistance. It includes representatives of all ministries. It established a cycle of foreign assistance programming called National Indicative Programme that meets EU procedural requirements.

Investments are mainly reflected in the PIP under loans. However, some grants also reach Latvia, particularly for environmental investments. But again, it is mixed up in reporting with EPF grants.

Enterprise funds

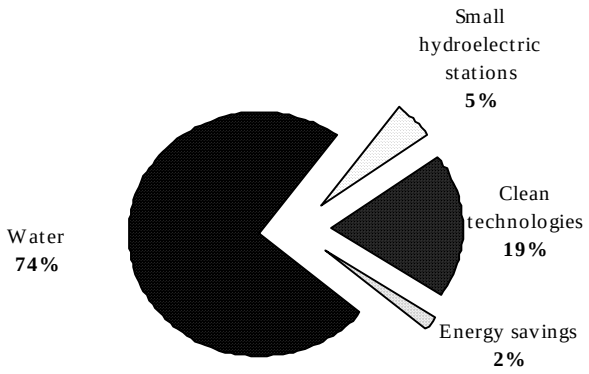
The Central Statistical Bureau (CSB) has collected data on expenditure for environmental protection since 1991. However, the data are probably underestimates (Table 3.6). Table 3.5 lists the investments into public enterprises only.

Environmental expenditure

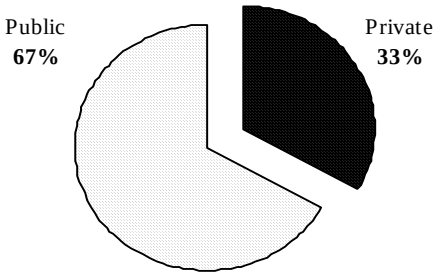
Table 3.6 illustrates Latvia's total nominal environmental expenditures. The table shows that total environmental expenditure rose till 1994, and then plunged sharply. At current prices, the expenditure-to-GDP ratio plummeted to 0.5 per cent. In 1996, total capital expenditure amounted to almost 14 million Lats (3.5 million Lats for capital investments), while the PIP for the environment spent almost 9 million Lats. Interestingly, the CSB shows that 2.5 million Lats worth of capital investments come from budgetary sources and almost 1 million from enterprises' own funds. Water-related investments again took the lion's share. 2.4 million Lats came from budgetary resources and 0.5 million from enterprises' funds. The second biggest area, air protection, received 0.1 million Lats from company funds. Only 0.2 per cent were budgetary contributions. There are virtually no investments into waste management. The ratio of environmental investments to total gross fixed capital formation dropped from 5.3 per cent in 1993 to 0.8 per cent in 1996.

Figure 3.3: Latvian Environmental Investment Fund (EIF), 1998

a - By SECTOR



b - By RECIPIENT



Source: MEPRD, 1998.

Table 3.6: State environmental expenditures, 1991-1997

	1991	1992	1993	1994	1995	1996	1997	1998 a/
Thousand current lats								
Total Expenditure b/	**1 324**	**10 617**	**18 550**	**32 499**	**18 862**	**13 790**	**14 480**	**37 954**
Capital investment	390	2 477	10 610	10 006	6 250	3 528	..	..
Current expenditure	935	8 139	7 940	22 493	12 611	10 263	..	..
Percentages								
Total Expenditure								
Air protection	*11.2*	*5.6*	*9.2*	*3.7*	*11.0*	*8.6*	..	..
Water protection	*83.6*	*77.8*	*87.7*	*94.9*	*85.2*	*82.6*	..	..
Waste (municipal and industrial)	*2.9*	*13.4*	*2.0*	*0.9*	*1.6*	*4.5*	..	..
Land recultivation	*0.9*	*0.2*	*0.1*	*0.0*	*0.1*	*0.4*	..	..
National parks and reserves	*1.4*	*0.6*	*0.5*	*0.1*	*0.3*	*0.6*	..	..
Other	*0.0*	*2.4*	*0.4*	*0.3*	*1.7*	*3.2*	..	..
Environmental expenditure to GDP	**0.9**	**1.1**	**1.3**	**1.6**	**0.8**	**0.5**	**0.5**	**..**

Sources: Latvian Environment in Figures, Central Statistical Bueau of Latvia, Riga, 1997;
Indicators of Environmental Protection Latvia, Central Statistical Bureau of Latvia, Riga, 1997;
Economic Development of Latvia, Ministry of the Economy, Riga, December 1997;
Legislation on the Central Governmental Budget, Ministry of Finance, Riga, 1998.

a/ Estimated data.

b/ 1991-1996 data, total expenditure reported by CSB;
1997-1998 data, PIP for environment.

3.4 Conclusions and recommendations

Integrating environment-related economic instruments into economic development policies is a new issue for Latvia. Regulatory measures to protect the environment will be backed with economic instruments. As business standards are raised there are new opportunities for new instruments, like tradable licences. The country applies the principle of non-discriminatory treatment of trading partners and takes account of the need to safeguard the competitiveness of domestic businesses.

The need to integrate environmental considerations into key socio-economic decisions means that the focus of efforts to improve the environment is now switching from ad hoc solution to urgent environmental problems to their causes. It is there that the most cost-effective environmental action can be implemented and it is time to evaluate progress in terms of the objective of 'integrating' socio-economic and environmental decisions. This means that environmental costs and benefits need to be assessed, external costs need to be accounted for so that they become part of market prices, economic instruments need to be tuned more to inducing change in business behaviour, and all opportunities for withdrawing subsidies should be used. Plans and programmes at different levels, environmental procurement, environmental measures within the sector and implementation monitoring are supposed to have eco-efficiency targets. To this end, indicators should be developed and used to monitor progress.

MEPRD should be praised for its ability to adapt swiftly to new requirements for legislation and to respond to foreign donors' requests for project coordination. That has led it to streamline the many investment projects. The list of environmental protection facilities under construction is expanding. With limited staff, MEPRD is one of the main advocates of sustainable development principles. However, the financial resources available today limit its potential. At the same time, revenues from pollution charges are rather low, so that polluters do not fully incorporate environmental externalities in their costing procedures.

Recommendation 3.1:
The required strategy for future environmental management should specify in detail the economic instruments envisaged for the integration of socio-economic and environmental decisions by both public and private sectors. See also Recommendation 1.2.

More attention and analysis have to be devoted to studying the effects of economic instruments, in order to gain insight into which levels of charges are sufficient to produce the intended results. Such analysis requires the development of knowledge on both the assessment of environmental effects of economic activities and the reaction of the economic activities to the economic instruments. If analysis shows that levies have to rise steeply but might threaten business competitiveness, they should be phased in very gradually.

Recommendation 3.2:
The revenues from pollution charges should be raised to such levels that they increasingly induce polluters to adopt less polluting techniques. The polluter-pays principle should be applied more systematically and the precautionary principle promoted.

Currently, the pollution charges and environmental penalties and sanctions are low. This would appear to encourage businesses to take low-cost measures to minimize waste or emissions during the production process, because they can expect the charges to increase. The encouragement would be stronger if a schedule for the increase in charges were made known to enterprises, preferably as part of a comprehensive demonstration of all positive effects of minimizing waste emissions, including their possible resource and energy efficiency. Such a demonstration should also be part of the required development of long-term environmental strategies for the country (see Chapter 1).

Recommendation 3.3:
The efficiency of existing economic instruments should be analysed. The analysis should be used to design feedback mechanisms, so that the economic instrument can be set at the level that will prompt the intended reaction by the target enterprises, without endangering economic recovery. An analysis is also required before the environmental charges and taxes are raised.

The natural resource tax is administered efficiently. If the State Revenue Inspection is good at collecting taxes, economists need access to detailed tax information for analysis. Also, economic analysis requires accurate data on environmental expenditures. However, environmental reporting on protection expenditures is insufficiently reliable. These problems are associated with the

modernization of economic data. Nevertheless, better coordination in the estimation of expenditure data seems feasible and would improve reliability.

Recommendation 3.4:
In the short run, incentives should be maintained for businesses to introduce low-cost measures and to make their production facilities more environmentally friendly. The measures providing such incentives should be developed and published by the Ministry of Environmental Protection and Regional Development as a matter of urgency. See also Recommendation 1.2.

Recommendation 3.5:
The statistics on environmental expenditure should be improved as a matter of priority. The Central Bureau of Statistics, the Ministry of Finance, the Ministry of the Economy and the Ministry of Environmental Protection and Regional Development should be involved in solving this problem.

Chapter 4

ENVIRONMENTAL AWARENESS, EDUCATION AND INFORMATION, AND PUBLIC PARTICIPATION IN ENVIRONMENTAL DECISION-MAKING

4.1 Background for Latvian public interest in the environment

Latvia's recent history has demonstrated a strong connection between environmental awareness and the fundamental changes of the late 1980s, leading to the country's re-emergence as an independent State. In fact, an important part of the present leadership and senior civil servants came to prominence through their environmental activism in the late 1980s. For other reasons, too, numerous aspects of the present relation of the Latvian public to environmental policy arose in the past half-century. Some are not specifically environmental. For example:

- In geographical terms, many Latvians tend to identify with the important cities such as Riga, Liepaja and Ventspils rather than with Latvia as a whole.
- A large part of the population speaks Russian as its first language. As national awareness is re-emerging, national confidence has not yet had the time to mature and relations between population groups have not settled, so that the management of public participation in any issue of general concern becomes complex.
- NGOs could not always be clearly distinguished from government – a circumstance that complicates relations between the governmental and the non-governmental sector even today. On the other hand, environmental activism has evolved less by public dialogue than by polarized action after things went wrong.
- Socialism left a relatively strong education system, and a relatively well-educated population; human capital is valued highly.
- The system of official statistics is fairly solid and elaborate, although coming from a tradition that was usually stronger in producing official data than in critically evaluating them and building up public trust.
- For many Latvians personal priorities in recent years have been dictated by a deep economic crisis.

Against this backdrop, it is a formidable challenge to steer the current transition in such a way that environmental protection and democracy will indeed reinforce each other, as was the vision in the late 1980s. This chapter reviews Latvia's performance in the four related fields of public awareness, public participation, environmental education and environmental information.

4.2 Public awareness

With the prominent place of environmental activism in recent history, public awareness of environmental issues in general is relatively high. This is illustrated by the low share of <don't know> answers in the most recent survey available (see Box 4.1). Latvians seem to be more concerned about their immediate surroundings than about the environment in general. They are rather critical of the environmental protection in their immediate surroundings.

The available survey results have not been broken down to show differences in opinion between population groups. However, some research into this is currently being carried out. Also, little systematic information is available on the public ranking of environmental issues vis-à-vis other problems, and its development over time. Economic hardship, poverty and the development of political relations with the Russian Federation and the EU can be expected to compete with environmental concerns. The monthly public opinion poll about the popularity of cabinet ministers is probably the best gauge of public concerns. The Minister for Environmental Protection and Regional Development is always close to the top. But although this is politically important information, it is difficult to interpret in

Box 4.1: Public opinion in Latvia about the environment, 1995

Attitude

- The state of the environment is:	%
Bad	26.4
Average	50.6
Good or very good	10.3
Don't know	6.9

- Urban/rural split, expressed as average answer *(on a -1 (bad) to +1 (good) scale):*

Cities	-0.25
Rural	-0.14
Small towns/villages	-0.03
Natural environment	-0.02

almost cancel each other out; the state of the environment in cities is seen as worse than in rural areas, but both are seen as fairly bad.

Perception of own surroundings

- I appreciate my own surroundings as:	%
Bad or very bad	26.9
Average	43.3
Good or very good	28.1

Note: The environment in cities was rated below average.

- I am satisfied with the environmental protection in my immediate surroundings:	%
Dissatisfied	42.1
Neutral	27.3
Very satisfied	14.1

Information and knowledge

- My information level about environmental problems is:	%
Low	55.2
Average	34.1
Enough	7.9

- My information level about environmental policy is:	%
Do not know enough	62.5
Average	23.8
Well-informed	4.3

- Sources of environmental information, expressed as average answer ***(on a -1 (least important) to +1 (most important) scale):***

Regional Environmental Board	-0.50
Newspaper, TV	around average
Own observation	+0.15
Local sources	+0.60

Note: This matches the general pattern reported for trust in information sources for Latvia in this year, with local sources ranked high, audio-visual media trusted somewhat more than newspapers, and official sources very low.

Public participation

- The public must take part in environmental decision-making...	%
...yes	84.0
...not necessary	5.0
...no opinion	11.0

- Own behaviour towards the environment ...	%
...tried to do something about own behaviour	88.2
...want to promote environmental friendliness at workplace	67.2

- The realities of environmental decision-making ...	%
...have taken part in environmental decision-making	6.0
...believe my taking part contributes to a lasting difference	4.0

Note: The survey was carried out in 1995 by the University of Riga, among 534 respondents. Of these, 291 lived in Riga and surroundings and 243 in Preilos and the Preilu district in Eastern Latvia. Their education level was just above average.

Source: UNDP, 1996.

terms of changes in the relative weight people assign to environmental issues.

4.3 Public participation

Box 4.1 shows that no more than 4 per cent believe that their actions will have a lasting effect on the environment.

Non-governmental organizations

The birth of the Latvian environmental movement can be dated back to the foundation of the Latvian Society of Nature and Monument Protection in 1959. Most Latvian NGOs were founded in the late 1980s and early 1990s, i.e. during the political changes. Today there are 60 environmental NGOs regularly active in Latvia. The largest are the Environmental Protection Club with 3 000 active members and the Latvian Society of Nature and Monument Protection with 2 000 members. Most NGOs have between 10 and 25 members. About two thirds of Latvian NGOs are located in small towns and villages, while about one quarter is located in Riga. This is a remarkably low share, not only because Riga is the seat of the national Government, but also because Riga district houses almost half the total population.

In addition to Latvian NGOs, quite a few international environmental organizations have set up offices in Latvia. There is no central bureau for environmental NGOs. Donations to registered NGOs are tax-deductible. The registration is a painstaking and time-consuming process. Some complain that it is too restrictive and cumbersome. However, it appears that some restrictiveness is a useful provision against shady NGOs.

The annual budgets of domestic NGOs range from US$ 500 to 5 000; only three NGOs have budgets exceeding US$ 50 000 per year. Box 4.2 shows that NGOs in Latvia receive their funds from an array of sources that matches the usual pattern in central and eastern Europe, including about one third directly or indirectly from foreign sources.

A breakdown by activity (Box 4.2) reveals that the smaller part of the activities of environmental NGOs is oriented towards directly influencing government decisions, while most of their activities are aimed at the public and at practical action. In the mid-1990s Latvia saw examples of such practically oriented NGOs being incorporated into the government apparatus.

Box 4.2: Financing of environmental non-governmental organizations, 1996

%

	in Latvia	in Central and Eastern Europe
Foreign grants	18	13
REC grants	18	9
Member fees	15	16
Services	15	11
Local donations	14	18
Other a/	11	23
Government grants	9	10

Source: REC (REC, 1997).

a/ Including training and publications.

Legal provisions for public participation

Legal provisions for public participation in decision-making exist, in particular in the 1991 Law on Environmental Protection. However, they have been formulated as fundamental rights and are not accompanied by procedural provisions. The latter is especially important in Latvia in view of the legal practice of following the letter rather than the spirit of the law. Moreover, the present legal situation is not always very clear, with a mixture of old Soviet and recent Latvian laws coexisting, while most energy in legiferation is now concentrated on EU approximation (see Chapter 1). The 1991 Law on Environmental Protection not only states the rights of the inhabitants, but also imposes on them the obligation to "prevent environmental degradation and irrational use of natural resources, participate in improving the environment and request that other legal and physical persons do likewise".

Legal standing (the possibility to go to court) for members of the public in environmental matters is elegantly anchored in the 1991 Law on Environmental Protection, as amended in 1997, which states that the inhabitants of Latvia have the right to live in a healthy environment. They may "apply to legal protective institutions with requests to revoke or suspend decisions or instructions of officials of institutions that ignore the rights and legal interests of inhabitants and public organizations".

Contradictory statements were received during the review mission about whether or not a right of initiative exists for the public. The Constitution of 1922, reinstated in 1990, contains a provision to the effect that the public can propose legislation by petition of 10 per cent of the electorate (art. 65). At

Box 4.3: Activities of environmental non-governmental organizations in Latvia

	% of total NGOs
Education and training	39
Collection and dissemination of environmental information	37
Environmental fieldwork, clean-up, monitoring	35
Public/alternative environmental expertise	27
Networking with other NGOs	27
Environmental protest actions	24
Lobbying and participation in the law-making process	24
Special research, environmental technology design	21
Other	6

Source: REC (REC, personal communication).

least some consider this right important; it may have symbolic value as well.

One important example where legal provisions are being improved is the new Law on Environmental Impact Assessment (see section 1.6: Environmental impact assessment). The old law entrusts the impact evaluation to government-designated experts and merely states that the public has a right to be informed of the outcome. The new Law provides for a public hearing, a separate Cabinet decision on the procedure, the obligation of authorities to take public opinion into account and the possibility for the public to appeal decisions on both the necessity of EIA and the eventual decision on the proposed activity.

Analogous arrangements are found in the Regulations of the Cabinet on public hearings in relation to construction (1997) and in the draft law on regional development. The latter contains very precise rules on involving the public. Environmental law and the general laws that make provisions for public participation in decision-making do not distinguish between citizens and other residents.

The practice of public participation in decision-making

Classic cases of public participation in Latvia concern successful opposition against proposed construction projects, such as the large hydropower installation near Daugavpils (1987), the Riga metro (early 1990s) and currently against new petrol stations that foreign companies plan to build at various places in the country.

Another important example has been the preparation of the National Environmental Policy Plan (NEPP). This took place in 1994-1995, i.e. a few years after independence. It was the first strategic document of its kind accepted by the Latvian Government. Vision building was an important aspect of the preparation process. The preparation of the plan started in the midst of the economic crisis, with no sectoral organizations available yet to help organize input from various sectors of society. Instead, ministries of the young government participated informally. Only later in the process was this procedure promoted to the interministerial level.

In retrospect, and understandably given the situation at the time, the NEPP process lacked several ingredients of public participation. In particular, NGOs did not participate as such. In part, this can be explained by the fact that many of the governmental participants had themselves strong ties with the opposition forces at the time of the changes, and had been active as environmentalists. Also lacking was participation by the business sector, as well as early formal links to the other ministries. Above all, the plan itself does not feature negotiated targets. On the positive side should be mentioned the elaborate national tour made by the team preparing the Action Plan, following the Policy Plan, in order to win support from local officials and stakeholders.

Many features characterizing the NEPP preparation still hold. A few points have to be added. First, the Latvian Parliament has a very low profile in environmental issues. This relates to the fact that environmental issues are dealt with by the Parliamentary Commission that also covers social issues - including 'hot' issues like pensions and social security. In practice, little attention is left for the environment. However, public access to Parliament sessions (visiting a deliberation) is only

possible if announced some days in advance, for security and organizational reasons.

Second, one particular business sector that seems to be absent from public participation, or even as an information user, is the domestic financial sector. This is remarkable, as the larger banks in traditional market economies tend to have one eye on future environmental problems of specific sectors of the economy, and usually commit some research to this.

Third, some NGOs report positive examples of cooperation with the national Government. The reported examples concern the Ministries of the Economy and of Agriculture (responsible for forest management). The forestry example is about swapping areas currently protected for military reasons against areas where protection for ecological reasons is requested. Although this is a rather specific issue, the alliance between NGOs and the forestry sector can be important in the future in view of the potential introduction of ecologically less friendly forestry techniques in the region.

Finally, environmental protection as a whole seems to have attracted little interest and involvement among the large Russian-speaking minority. This situation creates obvious stumbling blocks for the development of public participation that is representative of all population groups – the more monolingual the other partners in environmental decision-making are (e.g. industrial managers), the higher the stumbling block. Also relevant in this connection is that, according to surveys (UNDP, 1997), all population groups identify equally with local environments – which are obviously among the most relevant for public participation.

4.4 Environmental education

NGOs direct an important part of their activities towards informing and educating the public. One example is the VAK Green Centre in the Kurzeme region. However, the core of environmental education in Latvia is formal education.

Primary and secondary schools

Environmental education has no formal status in the curriculum. It is treated as a cross-curricular theme. It places special emphasis on environmental issues in various aspects of school life, such as school camps and in particular school projects. National programmes, typically involving 10 to 30 schools across the country, have a special place (see Box 4.4). Many involve international collaboration, Europe-wide as well as within the Baltic region. Some consist in students carrying out projects, others aim at training trainers and developing and trying out guidelines.

Box 4.4: Educational programme and projects on the environment

A real incentive for teachers and students has recently been the National Olympiad of Environmental Projects organized by the Curriculum Development and Assessment Centre. 14 Latvian projects were submitted to the competition this year, 2 of them were selected for the International Olympiad in Turkey, where they won recognition. Another project for the Baltic Sea involved 24 schools. Many other educational projects on the environment are carried out jointly with foreign partners.

'Environmental Education in Latvia' is a three-year project of the Norwegian and Latvian Ministries of Education involving 16 schools. A chosen topic, different in each school, is studied and published in written form, and later used by teachers as educational material. In cooperation with the United Kingdom, the children's environmental school of Latvia developed a project on "Implementation of Environmental Education Strategy in Latvian Schools". Other national projects (on energy, the Daugava river, etc.) were carried out with the involvement of dozens of schools all over the country.

Even more than inter-school and international collaboration, it is enthusiastic voluntary work by teachers that carries environmental education in primary and secondary schools. Another mainstay is professional support in the form of guidelines and recommendations (by the Curriculum Development and Assessment Centre of the Ministry of Education and Science) and teacher training and information by local Environment Education Centres in Kuldiga, Liepaja and Daugavpils.

The following major difficulties have been identified for environmental education at this level:

- General problems - such as underpaid teachers and lack of textbooks - are more pressing for schools than environmental education. There is no formal recognition on the part of the national Government of the importance of environmental education, nor any definition of its status.
- Teacher training is insufficient, as is the provision of educational materials. Schools lack experience with cross-curricular work and active approaches to teaching.
- There is a lack of coordination between the two ministries involved (Ministry of Education and Science and the Ministry of Environmental

Protection and Regional Development) and NGOs. This results in overlapping activities and parallel events.

University education

Environmental education at university level is concentrated at the Centre for Environmental Science and Management (CESAMS) of the University of Riga. This Centre is an inter-faculty unit, as can be found in many west European universities. Two lines of work can be distinguished:

- Environmental pedagogy. This contributes to the area of work described above, *inter alia* through in-service training and international collaborative curriculum development.
- Environmental science and management studies. This line of work aims at research and academic and professional training. It is strongly interdisciplinary and works towards application in environmental policy, planning and management. The core is an 18-month full-time MSc course.

Since the establishment of the Centre in 1993 (previously it was an NGO), some 200 students have taken its programmes or are currently enrolled. A typical problem of the Centre is that the funding fluctuates with the coming and going of foreign and international projects.

One innovative activity of the Centre, cutting across the issues in this chapter, is the PHARE-sponsored project Democracy and Sustainable Development. Its aim is to revitalize the links between stakeholders at the local level. In 1997 ten workshops were held outside Riga, with municipal and regional actors in different combinations.

4.5 Environmental information

Public access to environmental information

The law provides for access to information on the environment for members of the public. However, as with participation in decision-making, the arrangements are of a general nature. The Constitution gives every person the right to 'freely acquire and disseminate information' while these 'rights must not be restricted by censorship'. The 1991 Law on Environmental Protection states that inhabitants have the right to receive full and accurate information on the state of the environment and nature, including information about specific areas.

In addition, the Law on Applications, Complaints and Recommendations in State and Municipal Institutions (1994) stipulates that written information requests by the public to civil servants should be answered within one week to one month at the most, depending on the availability and detail of the information. The 1994 Law on Public and Civil Service on the procedure for receiving submissions, complaints and recommendations in State and municipal institutions lays down the procedures and terms for access to information on, for example, requests for permits.

It seems that these rules are respected in practice. Comments about lack of information, received during the review mission from several NGOs, did not concern information about the environment, but information about procedures, dates and terms that are necessary to effectively participate in decision-making on specific proposals.

The Environmental Consultancy and Monitoring Centre now acts as the government agency for the provision of information. NGOs also take a role in disseminating environmental information, often through libraries or information centres (see also Box 4.3).

Access to emission data of individual enterprises can be obtained by everybody, based on a recent interpretation by the Central Statistical Office of the new Law on Statistics. The Law states that environmental information is available without confidentiality restrictions.

Two comprehensive printed sources of environmental information are available: the compendium of environment statistics, compiled by the Central Statistical Office, and the state-of-the-environment report, compiled by the Environmental Consultancy and Monitoring Centre and distributed free of charge.

Availability of environmental information to the Government

The set-up in Latvia to provide environmental information to national and local authorities is similar to that in most other countries in central and eastern Europe. Specialized organizations, including local authorities, for instance in Riga, monitor ambient quality (see also Chapter 6). The

national hydrometeorological organization has a central role. The Central Statistical Office provides an important part of the relevant information, not only environment statistics as such, but also with regard to the data on economic activities and resource use.

Latvia also has a dedicated Environmental Data Centre. Its primary role is to act as an 'emissions register', collecting, processing, storing and disseminating official data on environmental pressures from individual enterprises. This regards air pollution, water use and waste-water discharges and the release of hazardous waste. In addition, the Environmental Data Centre has acted as Latvia's central point for retrieving and forwarding all environmental data for the compilation of the Dobris+3 report. In the framework of a government-wide programme, the Centre is drawing up plans to make its information available on-line to all the relevant authorities.

The emission data are collected and provided to the Environmental Data Centre by the regional environmental boards. Critical validation is not routinely carried out, and much of the emission information corresponds to the values in the enterprises' permits.

Latvia also has a special organization (the Environmental Consultancy and Monitoring Centre) to synthesize the available information into comprehensive, analytical state-of-the-environment reports. The first edition of such a report was published in 1997. In addition to its synthesizing role, the Environmental Consultancy and Monitoring Centre handles information requests from the public and has the task of coordinating environmental monitoring (see the section below). The Environmental Consultancy and Monitoring Centre is an example of an NGO that has been incorporated into the civil service, as the Ministry of Environmental Protection and Regional Development internalized key expertise in the mid-1990s.

Coordination of environmental monitoring

The coordination of environmental monitoring is a problem in every country. Partly, this is because environmental information is not a closed domain: the data collection overlaps on all sides with that for other - often older - areas of government. In addition, administratively Latvia is, to some extent, still building on the coordination arrangements of the former Soviet Union, which were slightly more complicated than elsewhere in the region.

However, coordination is improving. At present, the monitoring system in Latvia consists of: (i) State environmental monitoring, consolidated by the MEPRD and financed by a special State monitoring budget, and (ii) monitoring carried out by municipalities, research institutions and other ministries and financed from other sources. In 1997, the Interministerial Environment Monitoring Council was created to coordinate the different programmes and contractors and the exchange of information. A regulation was also adopted in 1997 to give legal status to the State environmental monitoring system and define its structure, financing and information exchange. A complex programme of environmental monitoring is being worked out. It will include nine large monitoring programmes, each of them consisting of separate but coordinated sub-programmes. The first of these programmes was adopted in February 1998 for surface water monitoring, as it was a priority topic.

The Environmental Consultancy and Monitoring Centre has been given the task of coordinating environmental monitoring, using its overview position as the synthesizing agency for the state-of-the-environment report. It commands a small complementary budget to fill in priority gaps in existing monitoring. Apparently, it has just begun to carry out this task. During 1997-1998, together with the organizations concerned, a detailed inventory of all ambient monitoring was made and a coordinated plan is being formulated.

4.6 Conclusions and recommendations

Results of public opinion and public awareness polls from 1995 look 'normal', although many respondents complained about a lack of environmental information. However, the problem is that such polls are not carried out regularly. Moreover, they do not break down the respondents by population group, although there are indications that at least the active involvement of the public differs strongly according to that criterion. Direct and representative opinion polls are paramount. Such polls can perhaps be coordinated with the Eurobarometer.

Recommendation 4.1:
Public opinion regarding environmental policy and management should be monitored by a regular poll, which documents possible differences between population groups, including age classes.

The absence of the large Russian-speaking minority from environmental decision-making is a serious impediment to public acceptance of environmental management. In addition, it hampers representative and credible environmental management. Too little seems to be known about the reasons for this and research is urgently needed. Depending on the results of the research, measures will have to be taken. For instance, key environmental information could be disseminated also in Russian, depending on the overall strategies for government information. Also, active collaboration with one or more of the Russian-language media could be considered to improve the coverage of environmental issues. Opportunities for on-the-job training activities of the Centre for Environmental Science and Management (CESAMS) at the University of Riga could also be investigated.

Recommendation 4.2:
An in-depth analysis of the possibilities for activating the participation of all major population groups in environmental decision-making should be commissioned.

Environmental NGOs and the Ministry of Environmental Protection and Regional Development do not collaborate optimally. Moreover, substantive debates between the Ministry of Environmental Protection and Regional Development and other ministries and sectors of society need to be activated. These objectives require steps by all sides, including the NGO community. It is also worth mentioning that, at the June 1998 Conference 'Environment for Europe', Latvia signed the new UN/ECE Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters.

Recommendation 4.3:
NGOs should set up a joint liaison office to participate in decision-making at the national level and in decision-making in the approximation to the EU.

The general right to access to environmental information is sufficiently guaranteed. The statement on the environmental obligations of inhabitants, as well as their rights, is laudable and merits active promotion during the approximation of Latvia to the EU. In contrast, practical arrangements for access to information are insufficient. In addition, a programme should be developed that actively brings environmental information to the attention of the public, whether or not it is requested. Future rationalization of the environmental legal system should also improve the practical possibilities for presenting environmental cases in court.

Recommendation 4.4:
The government organization responsible for disseminating environmental information should be clearly identified (either as a special unit in the Ministry of Environmental Protection and Regional Development or the environmental protection agency, if founded). All the practical procedures for requesting such information should be specified. Cooperation with NGOs should be sought for the development of an active dissemination programme for environmental information. Information should be disseminated in plain language. Local authorities should consider taking analogous initiatives.

The synthesizing role of the Environmental Consultancy and Monitoring Centre is very useful and appropriate. The distinction between basic data (from the Central Statistical Office, Hydromet and the Environmental Data Centre) and integrated assessment (from the Environmental Consultancy and Monitoring Centre) corresponds well to the demand for both, and the two require different skills and procedures. The current emission data should not be entered in a government-wide electronic information system, as long as these data are not appropriately validated. When environmental information is entered in such a system, it should be made public to the largest extent possible.

Efforts should at present focus on making data on emissions to air, waste-water discharges and the generation of hazardous waste more reliable. This would enhance their value. The experience that can be gained from improving reliability can also be used for improving and rationalizing the system of emission estimates and for linking different categories of information in the state-of-the-environment report.

Recommendation 4.5:
Latvia should urgently set up programmes to check emission data systematically against ambient measurements, applicable international standards or international emission estimates, through modelling. The programmes should apply to local air pollution, long-range transboundary air pollution, fresh and marine water pollution and the release of greenhouse gases.

Promising efforts have been made by the various monitoring agencies to coordinate environmental monitoring. The joint detailed plan for freshwater monitoring is a case in point. However, it is difficult to believe that coordination will be reached and maintained purely on the basis of collegial understanding. As a policy maker, the MEPRD should proactively define its information needs according to its policies, and an agency with a centralized budget would contract and coordinate environmental institutions and other organizations for all regular monitoring tasks and data provision (see also Recommendation 1.4). Such an agency could also be instrumental to the ongoing preparation of the separate compendium (bulletin) on environment statistics and a state-of-the-environment report, the latter providing assessments on the basis of the former.

Recommendation 4.6:
The present, promising work to coordinate monitoring could perhaps be further improved, if it is carried out within an environmental protection agency. The substantial resources required for monitoring should be made available, particularly for high-priority health and environmental concerns.

A majority of the monitoring programmes are financed by the State budget, thus ensuring their continuity in times of tight budgets and resources. Among the most costly monitoring programmes is sea monitoring, financed largely from the Environmental Protection Fund. Financing is therefore obtained on a year-by-year basis, and allocated upon submission of a project proposal. Owing to the importance of sea water quality in Latvia because of its long coastline, the threats of pollution created by oil terminals, the large quantities of pollution discharged by rivers into the sea, and the attention paid by HELCOM to the protection of the Baltic Sea, sea monitoring should be seen as permanent. Its finance should consequently be put on a more stable footing.

Recommendation 4.7:
Direct financing of the environment State monitoring programmes and data system from the regular budget should be increased. In particular, Latvia should consider financing the sea monitoring programme from the regular State budget.

The new Law on Environmental Impact Assessment improves public access to information and public participation significantly. Further improvements are conceivable but should be weighed against the need to speed up the application of the new Law. NGOs should seek to strengthen their capacity so that they can bring in high-quality expertise during EIA procedures and public participation. They should consider organizing this through the joint liaison office suggested in Recommendation 4.3 above. The new regulation that permits public access to emissions data from individual enterprises is remarkable. This is ahead of developments elsewhere. For the time being it could be considered to arrange such access on a voluntary basis, synchronizing further developments with the EU, in particular with the envisaged EU integrated permit system.

Recommendation 4.8:
A simplification of the procedures for individual EIA cases, which would avoid turning them into Cabinet decisions, should be considered for inclusion in the law on environmental impact assessment.

The low profile of the Parliament in environmental issues means that an important opportunity for public involvement is being missed.

Recommendation 4.9:
A separate parliamentary commission for the environment should be established. It should be encouraged to give NGOs an adequate hearing in its work.

Environmental education is definitely an important link between the public and the environment. Environmental education for the younger generation is strategically even more important in Latvia than elsewhere, because this is one of the points where the different population groups can be seen to converge. It would therefore be a step in the right direction, if environmental education could be introduced formally in the curricula for primary and secondary education. In practice, schools need means to consolidate and improve the level and quality of environmental teacher training. International cooperation could help.

Recommendation 4.10:
Environmental education should be introduced in primary and secondary school curricula, in a maximum number of subjects.

Chapter 5

INTERNATIONAL COOPERATION

5.1 General objectives for international cooperation

Since its inception in 1993, the MEPRD has also been responsible for the development of international cooperation in its field of competence. The European Integration Unit was established to coordinate the EU approximation process. In general, international requirements became one of the most relevant factors for the development of national environmental legislation. In addition, national programmes devoted to the development of different branches of the economy and social life also included issues of international environmental cooperation.

The European Agreement requires Latvia to develop a policy which aims towards sustainability, based on the integration of environmental protection into sectoral policies, preventive action, the polluter-pays principle, fighting environmental damage at its source, and shared responsibility. The Agreement also states that the environment is one of the areas that need cooperation, as well as the approximation of Latvia's legislation with EU legislation.

With the current pattern and pace of reforms in Latvia, full transposition of the environmental *acquis* should be achieved in the medium term. However, effective compliance with a number of legal instruments (e.g. waste-water treatment, drinking-water supply, aspects of waste and air management) will only be achieved in the long term and will require a significant increase in environmental investment, as well as a major effort to reinforce the administrative capacity. The main long-term problem is the need for investment in infrastructure, especially in the water and the waste-water sectors.

The most general objectives for Latvia's current policy in international environmental cooperation are:

- Joining the environmental protection structures and activities of the EU by becoming a Member State of the European Union. Latvia is currently harmonizing its environmental legislation and regulations with EU Directives and practices to this end.
- Concentrating regional cooperation in environmental protection - particularly of the marine environment of the Baltic Sea area, according to the Helsinki Convention of 1974 and 1992 – on the development of infrastructure and regional sustainable development issues, by approximating and implementing adequate EU Directives.
- Attracting foreign investment and assistance for environmental investment programmes in the water and waste-water sectors, marine and inland water protection, and waste management projects.
- Applying international principles and best practices in environmental protection and sustainable development policy, legislation and practice.

The current substantial focus on EU approximation (for details see Chapter 1), i.e. the required adaptation of legislation, regulations and other legal instruments was preceded by a focus on the solution of the most burning inherited environmental problems. Latvia has acquired considerable experience in the management of such projects to improve its environment.

Paying attention to the pan-European scale of environmental problems, Latvia is actively involved in multilateral environmental cooperation developed under the UNECE, the Council of Europe, the EU-PHARE multi-country programme and other international organizations and programmes. Annex II lists the regional conventions to which Latvia is a party. In general, Latvia has been much more active in ratifying international conventions than their implementing protocols or similar instruments. The costs associated with the implementation of such instruments, together with its difficult economic situation might explain this discrepancy.

5.2 Multilateral regional cooperation in the framework of UN/ECE

Convention on Long-range Transboundary Air Pollution

The NEPP mentions transboundary air pollution as one of 10 priority problems. The main target is to abate potential transboundary pollution at the source, thereby reducing its transfer to neighbouring countries. In practice, Latvia receives twice the amount of transboundary air pollution it exports (see Chapter 6).

Latvia acceded to the Convention on Long-range Transboundary Air Pollution in 1994 and the Protocol on Long-term Financing of the European Monitoring and Evaluation Programme (EMEP) in 1997. Abatement targets for the major pollutants were established in general terms in the Protocols to the Convention:

- By the year 2000, the emissions of sulphur oxides should not exceed their 1980 level,
- By 1995, the emissions of nitrogen oxides should be below their 1987 level,
- By 1999, the annual emissions of volatile organic compounds should be down to their 1988 level.

Although Latvia is not officially a Party to these Protocols, its actual emissions of sulphur and nitrogen oxides, and of volatile organic compounds are nevertheless below the levels of these reference years.

Latvia sees the lack of funds as the main obstacle to its acceding to the other protocols to the Convention. This prevents it from fulfilling all the commitments, including the basic obligations, such as database, emission inventories, national programmes, special policy and strategies, introduction of pollution control measures requiring special equipment, etc. In June 1998, at the Ministerial Conference "Environment for Europe" in Aarhus, Latvia signed the two new protocols of the Convention on Long-range Transboundary Air Pollution, i.e. the Protocols on Heavy Metals and on Persistent Organic Pollutants. Latvia is also preparing for the ratification of the 1994 Oslo Protocol on Further Reduction of Sulphur Emissions.

Convention on the Protection and Use of Transboundary Watercourses and International Lakes

Transboundary watercourses are of particular significance to Latvia, as more than 50 per cent of the run-off from Latvian territory originates from transboundary waters (mainly the Daugava, Lielupe and Venta rivers). The transit waters from Russia, Belarus and Lithuania are part of its abundant water resources and contribute to the potential for hydro-power, but they also cause many environmental problems as Latvia is located downstream. In 1993, Latvia and Lithuania started, with the support of Sweden, a trilateral project for the protection and use of the Lielupe river. However, the results obtained are not sufficient, because funding is scarce and sporadic. Similarly, an agreement between local authorities was signed on the river Venta with limited results. In 1997 Latvia, Belarus, Russia and Sweden signed a memorandum of understanding on cooperation over the Daugava river. The participating countries will prepare national reports, on the basis of which a common report on the Daugava river will be finalized. The next step in this cooperation will be to work out a common management system for the Daugava river.

Latvia ratified the Convention on the Protection and Use of Transboundary Watercourses and International Lakes (Helsinki, 1992) in 1996. Latvia has since made an effort to participate more actively in international cooperation in this field. Its neighbours Lithuania and Belarus are not yet Parties to the Convention. The Convention has been in force since 1996. It requires the country, for instance, to take comprehensive measures to prevent, monitor, control and reduce water pollution. The obligation relates particularly to hazardous substances. Furthermore, the Convention encourages Parties to enter into bilateral or multilateral agreements, or adapt existing ones, with the riparian countries of the transboundary water concerned. Such agreements should include provisions regarding the prevention, reduction and control of transboundary impacts.

Latvia and its neighbours are not yet ready to adopt such an approach for various reasons, lack of experience and shortage of funds being the most important ones. Nevertheless, a PHARE-TACIS

multi-country project between Belarus, Estonia, Latvia, Lithuania and the Russian Federation has recently started, in a first stage relating to rivers between Latvia and Lithuania. Recently, Estonia has proposed a bilateral agreement to Latvia on the protection and use of transboundary waters for the two small tributaries to the Gauja, Salaca and Aiviekste rivers flowing from Estonia.

Convention on Environmental Impact Assessment in a Transboundary Context

Latvia acceded to the Convention in 1998. National legislation concerning environmental impact assessment (EIA) in Latvia was established in 1990. With the assistance of Finland, the new system of EIA was drawn up in the new Law on Environmental Impact Assessment, which is in line with the EC EIA Directive 85/337/EEC. The Cabinet of Ministers accepted the new Law on EIA in July 1998.

Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters

Latvia participated in the drafting of the ECE Guidelines on Access to Environmental Information and Public Participation in Environmental Decision-making. It signed the Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters at the fourth Ministerial Conference in Aarhus (1998). MEPRD is now working on the ratification of the Aarhus Convention. Prerequisites for public involvement in decision-making can be found in the 1998 Regulations on Physical Planning as well as in the new Law on EIA (see Chapters 1 and 2).

"Environment for Europe" process

Latvia has participated in the "Environment for Europe" process since its first ministerial conference in 1991. An important momentum of this process for Latvia, as for other ECE countries, was the endorsement of the "Environmental Action Programme for Central and Eastern Europe" at the Lucerne Conference in 1993. It served as a catalyst for the drawing-up of Latvia's National Environmental Policy Plan (NEPP) – the first environmental strategy in Latvia. The Netherlands and Sweden provided financial and expert support for it. The Cabinet of Ministers accepted it in April 1995 as one of the first sectoral strategies in Latvia. The NEPP sets environmental goals, introduces policy principles, policy instruments and lists 10 priority problems. Based on NEPP, measures for solving priority problems were specified and taken, and the National Environmental Action Plan was developed and approved by the Environment Minister in 1997 (more on this in Chapter 1).

At the environmental ministerial conference in Sofia (1995), Latvia participated in the drafting of the Pan-European Biological and Landscape Diversity Strategy, which was endorsed at that time. Latvia is also involved in the implementation of the Strategy at the European level, namely in the work of the Working Group for Action Theme 2, i.e. integration of biological and landscape diversity considerations into sectors.

5.3 Other regional cooperation

Baltic Sea Cooperation

For many reasons, effective environmental cooperation in the Baltic Sea region is developing among the Sea basin countries. In September 1990, the Baltic Sea Ministerial Conference took place in Ronneby, Sweden. The participating countries, including Latvia, adopted the Baltic Sea Declaration, calling for the establishment of a long-term action plan for the 'ecological restoration and preservation of the Baltic Sea.' Two years later, the plan was endorsed by the Ministers of Environment as the Baltic Sea Joint Comprehensive Environmental Action Programme (BSJCP or JCP). The JCP aims at restoring the Baltic Sea to a sound ecological balance. It focuses on urgent and technically realistic environmental measures that should be taken to support the implementation of the Convention on the Protection of the Marine Environment of the Baltic Sea Area (Helsinki Convention, 1974 and 1992). Since Latvia ratified the Convention in 1994, it has implemented a wide range of recommendations issued by the Helsinki Commission. As a Party to the Convention, Latvia is responsible for all pollution reaching the Baltic from its territory, irrespective of the origin of the pollution.

The JCP aims at reducing the pollution load from the atmosphere, land-based sources and marine activity. Its main components are policy, laws and regulations; institutional strengthening and human resource development; investment activities; management of coastal lagoons and wetlands; applied research; and public awareness and environmental education. JCP provides two kinds of support: "soft or assistance" and "hard or

investment" programme elements. Most of its investments are in: emergency support and systems; municipal waste-water treatment; combined municipal and industrial waste-water treatment; environmental control in pulp and paper as well as other industries; solid and hazardous waste management; and air quality management. Latvia is an active participant of the HELCOM Programme Implementation Task Force (PITF), which was established in 1992 to initiate, facilitate and monitor coordination of JPC implementation and to update it periodically. PITF is responsible for organizing and coordinating the implementation of the JCP. Of the 132 'hot spots' of both point and diffuse water source pollution that were identified for follow-up action under the JCP, 10 are located in Latvia. Half of them are subject to action under the National Programme on water and waste-water management (which includes Programme 800+). The time span for implementation is 20 years (till 2010).

Programme 800+ includes 110 projects, their total cost till the year 2010 being estimated at about US$ 400 million. In addition to Programme 800+, there are projects for water and waste-water management in the biggest cities of Latvia, total expenditures of which are US$ 82 million for Riga, US$ 21 million for Daugavpils and US$ 22 million for Liepaja. Funds to finance these projects come from State and local authorities, international financial institutions and organizations, and donor countries and institutions (see below).

Cooperation within central and eastern Europe

In September 1997, representatives of 10 central and east European countries (Belarus, Bulgaria, Estonia, Latvia, Lithuania, Poland, Republic of Moldova, Romania, Slovakia and Ukraine) signed the Torun Declaration on Cooperation in the Field of Environmental Protection Among Central And Eastern European Countries. They committed themselves to cooperating in specific fields of environmental protection, such as climate change, health and energy issues, environmental impact assessment, general and organizational issues of environmental policy, monitoring, and promotion of regional sustainable development strategies. The Signatories to the Torun Declaration will meet annually to share information and experiences.

Contamination of former military sites

After independence was re-established, Latvia faced many problems related to the need to clean up the sites that had been used by the Soviet army and to assess the environmental impact of the military activities. Specialists from Canada, Germany, Norway, and the United States participated in the investigations. With financial support from different countries, special pilot studies were undertaken on the development of technical cooperation in risk assessment of defence-related waste, and remediation of former military sites in Latvia. With the Ministries of Defence of Germany and of the United States, a project devoted to the creation of a crisis management system was also carried out.

Environmental protection divisions in the Ministry of Defence established cooperation with national environmental and other government authorities and scientific centres, such as the NATO Committee on Challenges of Modern Society (CCMS). Since 1993, military and environmental experts from Latvia have participated in several pilot studies and conferences organized by the CCMS, and benefited from training courses on environmental issues.

5.4 Bilateral and multilateral cooperation

EU partners

Latvia has received assistance from EU PHARE programmes since 1992. Up to the year 1997, the programme funded projects worth approximately ECU 130 million. The main programmes that have financed environmental projects are PHARE National, Cross Border Cooperation and multi-country programmes. Several projects have obtained financing from so-called 'horizontal programmes'. These are predominantly smaller projects initiated by local governments (e.g. Ecos-Ouverture, Baltic Small Projects Fund, Credo Programme). The environmental projects funded till 1997 under the EU PHARE National and PHARE Cross Border Cooperation Programmes represented approximately ECU 24 million. The investment component corresponds to 60 per cent of total funding.

The priorities for EU PHARE funding have been in

line with the National Environmental Policy Plan and the National Environmental Action Programme:

- technical assistance projects, including projects for capacity building and institutional strengthening, and also the preparation of feasibility studies (for example, for projects in Liepaja and Daugavpils);
- development of investment strategies (800+, water supply and waste-water treatment);
- water management projects (for example, projects in Liepaja, Daugavpils, Cesis, Jurmala);
- hazardous waste management programme;
- environmental education projects, a studio for environmental films, etc.

Within the framework of the PHARE programme, the MEPRD has received support from experts to improve several environmental regulations (e.g. on hazardous waste, EIA, water quality objectives, etc.). Under the EU PHARE multi-country programme, a project for Integrated Coastal Zone Management (ICZM) between Latvia and Lithuania was carried out. A follow-up project on the development of a Coastal Investment Strategy is being implemented for the coast of Latvia. The basic aims of integrated coastal management are the promotion of sustainable development and nature conservation. They are pursued by encouraging and assisting those with management and development responsibilities in the zone, mainly municipalities. Another ICZM project concerns the evaluation of the potential for investments and for support from the European Union and other major international financial institutions such as the European Investment Bank, the Nordic Investment Bank, NEFCO, and the World Bank.

Besides direct assistance from the European Commission, a number of EU countries provide assistance on a bilateral basis. Bilateral and trilateral agreements were signed with Finland, Sweden, Denmark, Netherlands and other countries. Considerable work is being done to amend legislation on water and waste-water management in cooperation with the Swedish EPA. The Government of Finland has provided support for the new Law on EIA. The Government of Denmark supports a framework project on the approximation of environmental standards and norms in Latvia. Cooperation in environmental education was agreed with the United Kingdom in 1995.

A specialization in areas of cooperation has developed since 1991. For example, cooperation with Finland mostly focuses on land use, water management and environmental monitoring. Cooperation with Denmark is very often on technologies for pollution prevention and waste minimization, management of hazardous waste, water management, nature protection, nuclear safety and radiation protection and housing. Sweden provides primarily assistance in the development of legislation in accordance with the EU Directives and water management, Switzerland in water supply, Germany in reactor safety, and the Netherlands in municipal landfills.

Neighbouring and other countries

A number of framework agreements on environmental cooperation have been concluded with neighbouring countries (Belarus 1994, Estonia 1994, Lithuania 1995). In 1995, Latvia, Lithuania and Estonia signed the Trilateral Agreement on Cooperation in the Field of Environmental Protection. It covers areas of cooperation like sustainable use of natural resources, protection of the sea and monitoring, environmental impact assessment, reduction and control of transboundary pollution, radiation and nuclear safety, etc. The Agreement stipulates that coordination and supervision of the relevant activities falls under the responsibility of the Baltic Council of Ministers. Under this Council, 19 committees work on different issues of Baltic cooperation, among them the Committee for Environmental Protection. It meets four times a year. The Committee discusses important issues and drafts environmental protection agreements. For instance, an agreement on Environmental Impact Assessment in a Transboundary Context between Latvia and Estonia was drafted in the framework of this Committee and signed by the Environment Ministers on 15 March 1997. A similar agreement between Latvia and Lithuania is in the offing.

In 1995, the Technical Protocol on Practical Aspects of Cooperation among the three Baltic countries was signed, thereby establishing the Baltic Environmental Forum (BEF). BEF was co-financed by Latvia, Lithuania, Estonia, Germany and the European Commission. Its main task is to support cooperation between the environmental

authorities of the three Baltic countries. The main form of cooperation is the organization of workshops on different issues. In 1998, the mandate of the Baltic Environmental Forum was extended until August 2000, as it was recognized that it had considerably strengthened cooperation between the three Baltic countries. BEF 2 is co-financed by the same partners as BEF 1, plus Finland and Sweden.

In addition, agreements on sectoral cooperation have been concluded, for example the 1993 Agreement on Environmental Management of the Lielupe River Basin with Lithuania. The Swedish Government and other donors supported the implementation of joint projects in this field.

Other bilateral cooperation has been agreed with Ukraine (1991, environment), Turkey (1994, tourism), the United States of America (1994, dismantling of abandoned military hardware), Uzbekistan (1995, tourism), and Poland (1995, natural resources and forestry).

5.5 Global cooperation

Implementation of Agenda 21

Having signed the Rio Declaration on the Environment and Development in 1992, Latvia is committed to introducing its precepts. The MEPRD is responsible for the implementation of Agenda 21 at the regional and national level. Care for the environment at the local level is one of its major aims. In this respect, the Ministry is encouraging the creation of Agendas 21 at municipal level. In response, nine municipalities in west Latvia have established a common institution for the promotion of Local Agenda 21 in their municipalities.

In 1996, eleven Governments of the Baltic Sea Region and the European Commission agreed to develop an Agenda 21 for the Baltic Sea Region (Baltic Agenda 21). In October 1996, the Environment Ministers of the region officially launched the project. In order to support sustainable development, sectoral policies have to be integrated and made to support general transition toward a more integrated approach. Seven economic sectors of crucial importance for sustainable development and integration in the region were chosen: agriculture, energy, fisheries, forestry, manufacturing industry, tourism and transport. Each country assumes responsibility for drafting specific chapters of the Baltic Agenda 21. Latvia and Germany are partners for the transport sector. Each of the seven sectors has carried out a sectoral analysis of the existing situation and drawn up proposals for action with a view to ensuring the sustainable development in the region. Based on the sectoral reports, the common Agenda 21 for the Baltic Sea Region was developed. One of its crucial parts is the Baltic 21 Action Programme. The main goal of the Programme is to strengthen regional cooperation and to build a solid foundation for the common, long-term transition towards sustainable development in the region. Actions are proposed for the next 20 to 30 years. The Baltic 21 Action Programme was approved in June 1998 by the Council of Baltic Sea States (Ministers of Foreign Affairs).

Sustainable development in the Baltic Sea Region implies not only economic development, but also balanced territorial development. On 21 August 1992, representatives from the ministries responsible for territorial planning in the countries around the Baltic Sea agreed to prepare jointly a territorial development concept, 'Vision and Strategies around the Baltic Sea 2010' (VASAB 2010). The result of the joint work of the VASAB 2010 initiatives is a long-term territorial development perspective, which is compatible with the relevant plans and efforts of the European Union, the Central European Initiative and the Barents Sea Council.

One of the projects carried out under the VASAB 2010 umbrella is the Tampere – Helsinki – Tallinn – Riga (THTR) project. In the corresponding development zone, the ultimate objective is to realize the VASAB 2010 targets as part of an overall balanced development for the eastern part of the Baltic Sea region. Some of the goals are to increase competitiveness of economic activities, to formulate alternative transport models, and to promote economic cooperation. The purpose of the project is to use territorial planning in order to ensure sustainable development in terms of both socio-economic and environmental conditions. Work on the THTR development zone began in 1995. Some of the main results up to now have been the establishment of GIS (Geographic Information System) workstations in Latvia. In addition, communication networks and procedures for planning and project implementation have been developed, and local authorities and professional staff have been trained in regional planning.

Climate change

Latvia signed the United Nations Framework Convention on Climate Change in 1992. The Latvian Parliament ratified the Convention in 1995. Latvia, as a Party to the Convention, took measures to fulfil a range of internationally adopted commitments, the main goal of which is to stabilize emissions of greenhouse gases by the year 2000 at a level not exceeding the 1990 emission level. The joint Latvian–Poland–Netherlands study "Policies and measures to mitigate greenhouse gas emissions or increase sinks in the Republic of Latvia" was carried out to assist Latvia in trying to meet requirements for the stabilization of greenhouse gas concentrations in the atmosphere. Its objective was to identify scientifically, and evaluate, possible measures for the energy and forestry sectors, in order to mitigate climate change and to propose a strategy for the stabilization and future reduction of greenhouse gas emissions. The Netherlands Government financed the study, technical and training support being provided by the Netherlands, Poland and Norway.

An inventory of greenhouse gas emissions in Latvia shows that they have halved between 1990 and 1996. However, this reduction is mainly because of the economic depression and not because of the successful implementation of reduction measures. Forecasts for the year 2000 suggest that total greenhouse gas emissions will not exceed their 1990 level, even if no specific action is taken. But it is forecast that the rapid economic development that started after 1995 (annual increase in GDP 4.6-5.8 per cent) will cause a gradual increase in emissions. It will not be possible to stabilize the reduced emission level achieved in 1995 before the year 2000.

In accordance with the 1997 Kyoto Protocol to the Convention, Latvia individually or jointly with others should ensure that its aggregate anthropogenic CO_2 equivalent of carbon dioxide, methane, nitrous oxide, hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF_6) in the years 2008 –2012 is 8 per cent below its 1990 level.

Climate change policy is to a large extent incorporated into other sectoral policies, e.g. environment, energy, industry, transport, agriculture, forestry and waste management policies. To help Latvia comply with the Convention's requirements, EU PHARE, Denmark, Sweden, the GEF and the World Environmental Centre (WEC) have provided foreign assistance. Several aspects of climate change have been discussed in the different sectors when Baltic Agenda 21 was drawn up. Under the joint implementation provided by Article 4.2(a) of the Convention, Latvia has started cooperation with Sweden, Germany and the Netherlands to improve energy efficiency and promote the use of alternative and renewable energy resources.

Protection of the ozone layer

The MEPRD began its programme against the depletion of the ozone layer in 1990, with the support of the Swedish Environmental Protection Agency. In 1991 and 1992, MEPRD compiled an inventory of locally significant types of industry linked to ozone depletion. Since 1992, UNEP has provided Latvian national environmental institutions with information about the Vienna Convention and the Montreal Protocol. Based on these documents, the MEPRD, together with other governmental authorities, and with the assistance of Finland and Sweden, completed the preparations for acceding to the Convention and the Protocol. On 14 March 1995, the Government of Latvia passed the Regulation on the Accession to the Vienna Convention and the Montreal Protocol, and both were ratified in 1995. In 1995, the Environment Ministries of Latvia, Lithuania and Estonia issued a notification to UNEP regarding the postponement of the implementation of the Montreal Protocol till 2000. The Country Programme "Phasing out the Ozone Depleting Substances'' was adopted by the Cabinet of Ministers on 29 August 1995.

Taxation of ODS is foreseen in the Law on Natural Resources Taxes, adopted in 1995. It became effective in early 1996. The tax on ODS is based on the ozone-depleting potential (ODP) of the substance. The rate will be adapted in such a way that it will make ODS more expensive than alternative substances. A joint proposal by UNEP and UNDP was approved by GEF in 1996. It deals with the financing and technical assistance for the implementation of the country programme, and is related to the formulation of an investment programme for the phase-out of ozone-depleting substances in Latvia. A preliminary estimate for funding the ODS phase-out, including projects related to institutional strengthening, aerosols, refrigeration and retrofitting, recovery and recycling of refrigerants, as well as developing of foaming processes, amounts to about US$ 1.7 million.

With the implementation of these measures, MEPRD expects Latvia to phase out ODS in accordance with the following schedule (consumption in 1986-2000, by substance, in tonnes of ODP):

Substance	1986	1989	1993	1995	1998	2000
Annex A Group 1	6 102	4 736	1 085	665	200	0
Annex A Group 2	100	100	79	30	15	0
Annex B Group 2	20	20	19	17	10	0

Latvia has ratified the London and Copenhagen Amendments to the Montreal Protocol. The ratification of the London Amendment obliges Latvia to contribute about US$ 140 000 a year to the Multilateral Fund of the Montreal Protocol to support developing countries (Article 5). The Government has prepared an Investment Project for the Phase-out of Ozone-depleting Substances. The outcome will depend on its ability to obtain financing from GEF. The next step will be ratifying the Montreal Amendment to the Montreal Protocol.

Transboundary movement of hazardous waste

Latvia ratified the Basel Convention in 1992. In 1993, it adopted the Law on Hazardous Waste, one of its first environmental laws. In 1996, the Law was amended. Some important amendments concern the import of hazardous waste from Estonia and Lithuania for treatment in Latvia. A reason for this decision was to facilitate cooperation among the Baltic States on hazardous waste management and achieve economies of scale (see also Chapter 9).

Nuclear and radiation safety

Regarding radiation protection, the Cabinet of Ministers has adopted several EURATOM regulations and directives (see also Chapter 1, section 1.9). Radioactive waste management is regulated by the Law on Radiation Protection and Nuclear Safety (1994, see Chapter 9). In 1996, the Regulation on the Issuance of Licences and Permits for Activities with Radioactive Substances and Other Ionizing Radiation Sources made it compulsory to obtain a licence or permit for any actions dealing with radioactive substances, including the disposal of radioactive waste. This regulation provides for the control of the import and export of radioactive substances and other sources of ionizing radiation and the control of existing sources of ionizing radiation of national importance. The applicants for an import licence have to pay a special import duty for radioactive materials. The Commissions for licensing grant the licence only upon payment.

Although it does not produce nuclear electricity, Latvia pays much attention to the development of international cooperation on nuclear and radiation safety. Ten regional projects for the development of systems to prevent emergencies, the safe use of radioactive substances in medicine, the management of radioactive waste, the decommissioning of a nuclear research reactor, radioactive sources of energy at lighthouses at sea benefited from financial support from IAEA, the Baltic Sea Council, the PHARE programme, and from Denmark, Germany, Finland and Sweden.

Several projects have been realized under the IAEA Coordinated Technical Support Plan to upgrade physical protection systems, facilities and materials. Nowadays, active cooperation is oriented towards the prevention of illicit trafficking of nuclear and radioactive materials. Within the framework of these activities, several radioactive monitoring gates have been installed on Latvia's borders. These actions have been supported by IAEA, the World Customs Organization, EUROPOL, INTERPOL, EU, and the United Nations.

Biodiversity protection and nature conservation

Latvia ratified the Convention on Biological Diversity in 1995. Maintenance of biodiversity is mentioned as one of the priority problems in the NEPP. In 1995 Latvia's National Biodiversity Action Plan was developed with the assistance of the World Bank. However, it cannot be considered as a binding governmental document. A country study on biological diversity was drafted in 1997 with the assistance of Norway. Then, Latvia submitted a project proposal to GEF to draw up a national biodiversity strategy and action plan. The project "National Biodiversity Strategy, Action Plan and Country Report to the Conference of Parties to the Convention on Biological Diversity" was approved by the GEF Council in October 1997. The implementing agency for this project is UNDP.

Latvia has ratified the most important international conventions on nature protection (for details, see Chapter 8). In addition to the Convention on Biological Diversity, Latvia also ratified the Ramsar Convention (wetlands protection) in 1995. Furthermore, it ratified the Washington Convention (CITES) in 1996, the Bern Convention (on wildlife

and habitats) in 1996, the Gdansk Convention (on fishing and living resources of the Baltic Sea) in 1996, the Convention on Climate Change in 1995, and the Helsinki Convention (on the Baltic Sea) in 1994. The Committee on Environmental Protection under the Baltic Council of Ministers coordinates the efforts of countries aimed at maintaining biodiversity in the Baltic region. The Committee has worked to establish bilateral agreements in nature conservation between Latvia and Estonia on the one hand, and Latvia and Lithuania on the other.

While the main source of financing for nature protection is the State Budget (78.4 per cent of the total expenditures for nature protection), contributions from abroad were also received: 9.2 per cent from international organizations, 10.5 from Denmark, 1.4 from Norway, 0.4 from Sweden in 1996. Besides the State Budget, financial support from non-governmental organizations should be mentioned as well.

Other issues for cooperation

Building the capacity of administrators in environmental issues, both at national and local levels, takes place as part of different projects (e.g. construction or reconstruction of local waste-water treatment plants, construction of landfills, renovation of drinking-water supply systems, etc.). Such training very often comes as part of technical assistance and investment activities of west European, especially Scandinavian, countries (in the form of bilateral cooperation), from the European Commission (PHARE and TACIS programmes), different international environmental foundations and funding agencies, banks, as well as the United Nations, the United States Environmental Protection Agency, etc. As a specific type of cooperation, twinning arrangements between enterprises, institutions and municipalities in Latvia and western countries should be mentioned.

5.6 International funding

Environmental investment priorities are determined by the NEPP, NEAP and the National Programme for Integration to the EU. They reflect current urgent national needs and international agreements. At the moment the priorities are:

- water protection;
- waste management;
- conservation of biological diversity and protected areas;
- air protection.

Recently, Latvia has developed an effective system of environmental decision-making and priority-setting for international assistance better, though it is difficult to obtain data on the contribution of foreign sources to environmental expenditures at the moment (see Chapter 3, section 3.3). Today, environmental investment programmes and projects cover almost US$ 200 million in total. Latvia tries to mobilize financing from various sources, leading to contributions from several sides for a given project. This applies to government resources as well as to assistance from western countries and IFIs. Grants are supplied by donors such as EU PHARE, Denmark, Germany, Finland, Norway, Sweden, Switzerland and the United States. Soft loans have been received from IFIs, e.g. the European Bank for Reconstruction and Development (EBRD), the European Investment Bank (EIB), the World Bank, the Nordic Environmental Finance Corporation (NEFCO) and the Nordic Investment Bank (NIB).

NEFCO, unlike other international foundations, takes part in the financing of enterprises with equity, thus becoming a temporary co-owner of the utility. Enterprises collaborate with partner enterprises in Nordic countries, thus gaining experience and improving institutional development on a basis of twinning arrangements. Cooperation between NEFCO and the Latvian Environmental Investment Fund (LEIF) in funding environmentally sound projects should start soon. Loan agreements will be signed with LEIF. NEFCO will take a seat on the Board of Supervisors of LEIF.

NEFCO is helping to finance the following environmental projects:

- Daugavpils Environment Project;
- Liepaja Environment Project;
- Water Supply and Sewerage in Cesis;
- Water Supply in Madona.

Loans are quite expensive for Latvia. Nevertheless, a considerable contribution has been made by the World Bank, which has taken part, or plans to take part, in the implementation of the following projects: Daugavpils Environment Project, Liepaja Waste Management Project, Liepaja Environment Project and Riga Waste Management Project.

The Nordic Investment Bank opened a credit line of ECU 20 million in 1997 to fund environment and energy projects. Negotiations are going on concerning the financing of the Liepaja Waste Management Project and the Jekabpils Water Supply and Treatment of Waste Waters project. EIB and EBRD are taking part in the implementation of the Environmental and Water Management Project in Riga.

The procurement procedures of some IFIs are seen by Latvia as long and difficult. The construction sector in Latvia is still developing and sometimes finds it difficult to compete with foreign companies when bidding for contracts. This results in few local companies participating in environmental projects, which in turn does not help to build local capacity and competence in this area. Quite often it is difficult to find local consultants offering the required capacity and experience to carry out environmental projects.

5.7 Conclusions and recommendations

Latvia is actively developing its international relations in environmental protection. This was already true before it concentrated its efforts on projects promoting its eventual accession to the European Union. Shortly after independence, Latvia strove to participate in cooperation explicitly aimed at safeguarding the Baltic Sea. This was a favourable context in which to increase bilateral contacts and arrangements with other Baltic Sea countries, be they western Nordic countries or newly independent countries in transition. Many bilateral agreements were concluded. Interestingly, they dedicate specific environmental issues/fields of expertise to specific countries, thus reducing the risk of overlapping to a minimum.

However, the situation regarding international legal instruments such as conventions and related protocols is not so bright. It seems that Latvia should devote more attention to the ratification of important instruments to which it is not yet a Party. This is true for the Bonn Convention on the Conservation of Migratory Species of Wild Animals and some of the Protocols to the Convention on Long-range Transboundary Air Pollution.

Recommendation 5.1:
Latvia should accelerate the ratification procedure for the Bonn Convention on the Conservation of Migratory Species of Wild Animals and the 1988 Protocol concerning the Control of Emissions of Nitrogen Oxides to the Convention on Long-range Transboundary Air Pollution. See also Recommendation 6.6.

The conventions that Latvia has ratified and which are important for biodiversity conservation (e.g. Ramsar, Bern, Washington) should now be implemented. Like its neighbours, Latvia is also involved in the implementation of the Pan-European Biological and Landscape Diversity Strategy and, under the Baltic Council of Ministers, is cooperating bilaterally with Estonia and Lithuania on nature protection. In 1998, Latvia also started, together with the two other Baltic States, to carry out the integrated coastal zone management plan, which is financed by EU PHARE. These convergent actions for the protection of nature in and around the Baltic Sea are remarkable. They should be complemented by natural transboundary bridges ensuring the continuity of protected zones from one country to another.

Recommendation 5.2:
Latvia should work at establishing transboundary protected areas with its neighbours, paying particular attention to areas that are important nesting zones for migratory birds.

Latvia has also successfully attracted foreign funding for its environmental projects. It has set up a structure and procedure to select projects according to its environmental priorities and channel foreign funding accordingly. In spite of the current difficulties to determine the overall volume of foreign environmental investments in the country, it seems that the strategy and priorities are clear. Whether the technological choices are based on a comparative evaluation of different possible options is, however, not so clear. Local specialists/consultants/enterprises do not always participate sufficiently in the implementation of projects. More attention should be paid to building the capacity of local consultants to enable them to participate in the project implementation.

Recommendation 5.3:
As the accession process to the EU evolves, assistance needs for environmental protection ought to be more fully recognized in the overall assistance process. Improved coordination of international funding for environmental purposes in either the Ministry of Environmental Protection and Regional Development or the environmental

protection agency, if created, would be an asset in the process leading to stepping up such and other international funding.

Recommendation 5.4:
The capacity of local consultants and building companies should be increased to help them to participate in environmental projects and compete successfully with foreign companies and consultants. The procurement procedures of some international financial institutions could perhaps be revised with this objective in mind.

PART II: MANAGEMENT OF POLLUTION AND OF NATURAL RESOURCES

Chapter 6

AIR MANAGEMENT

6.1 Air emissions and ambient air quality

Air emissions

Since 1990, the air emissions of the four main pollutants from stationary sources, SOx, NOx, CO and PM, have decreased on average by one third – their decline ranging from -11 per cent for PM to -40 per cent for SOx. These pollutants account for almost 80 per cent of reported emissions by licensed emitters. The remaining 20 per cent are divided among 160 other pollutants, with NMVOCs contributing the most (see Table 6.1). Other emissions included in Table 6.1 are only estimates, either by EMEP for CH_4, NH_3 and CO_2 or by the Latvian Environmental Consultancy and Monitoring Centre as regards mobile sources. The latter were disrupted in 1995, although traffic emissions are certainly on the rise as the number of vehicles has since increased by almost 40 per cent. According to ECE estimates, based on GOST emission factors and present motor fuel consumption data, emissions from the transport sector in 1996 amounted to 250 kt of CO, 60 kt of NMVOC, and 28 kt of NOx - largely exceeding the comparable emissions from stationary sources.

Table 6.1: Trends in emissions of selected pollutants, 1990-1997

1 000 t

		1990	1991	1992	1993	1994	1995	1996	1997
SO_x	**S**	56.706	58.480	38.264	43.710	51.599	38.075	44.930	33.821
	M	..	..	..	..	..	..	..	..
	T	..	..	..	..	..	..	..	..
NO_x	**S**	14.085	14.590	10.346	8.735	10.281	7.913	8.654	9.513
	M	65.830	30.300	25.800	20.660	35.170	21.280	28.000 a/	..
	T	..	..	..	..	..	..	..	..
$NMVOC_s$ (incl. H_nC_n)	**S**	..	..	..	..	..	..	..	4.573
	M	..	..	..	..	..	..	..	..
	T	63.000 b/	35.000 b/	30.000 b/	25.000 b/	24.000 b/	21.000 b/	61.000 a/	..
CO	**S**	33.049	32.095	23.120	20.915	24.724	23.425	23.768	23.950
	M	329.000	173.000	164.000	166.000	176.000	154.000	253.000 a/	..
	T	..	..	..	..	..	..	..	..
Particulate matter (PM)	**S**	13.991	16.498	10.116	7.428	8.547	7.416	6.960	12.320
	M	..	..	..	..	..	..	..	..
	T	..	..	..	..	..	..	..	..
CH_4		159 b/	159 b/	140 b/	106 b/	98 b/	98 b/	..	..
NH_3		44 b/	42 b/	33 b/	20 b/	17 b/	17 b/	..	..
CO_2 *(Million t)*		25	19	16	14	14	11	..	..

Source: ECMC data.

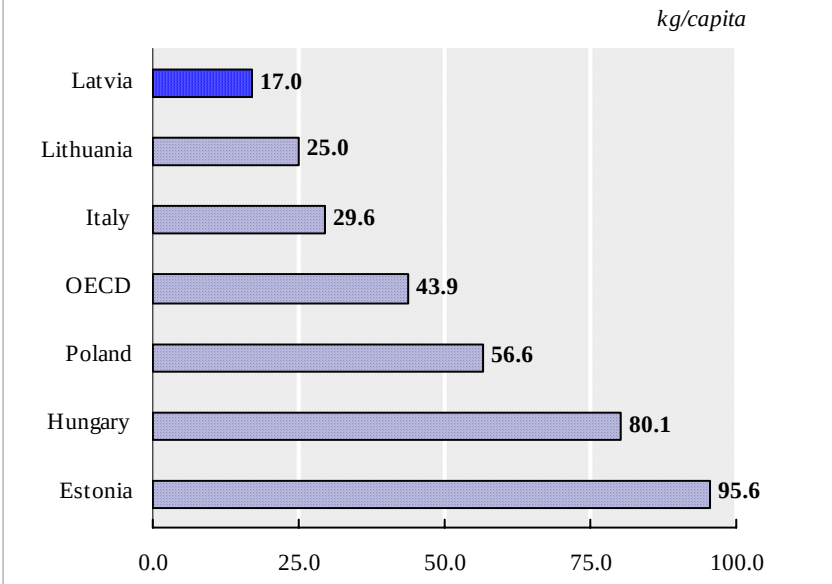
a/ Author estimates.

b/ EMEP emission database.

Emission sources: **S = Stationary sources**
M = Mobile sources
T = Total

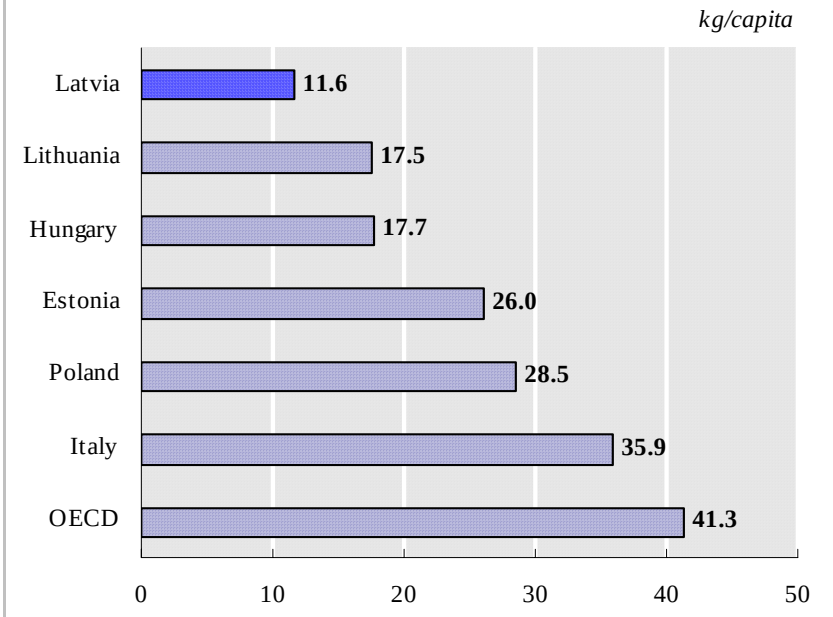
The emission inventory does not cover such important sectors as households or agriculture. Therefore, the EMEP sector split of emitting sources is not available. Of the 2 724 stationary emission sources that report emissions, combustion processes for heat and power production (1 833 boiler houses) are by far the most significant. They account for 98 per cent of SOx, 88 per cent of CO, 77.3 per cent of NOx and 42.5 per cent of PM emissions and are mainly located in the Riga and Daugavpils regions, which have 29 per cent and 20 per cent of combined emissions respectively. The main polluters within the energy sector are the Riga power stations (Rigas TEC-2 and VAS Latvenergo Rigas TEC 1). Together with glass wool, steel and cement companies, they are the country's biggest polluters.

Figure 6.1: Emissions of SO_x, 1995



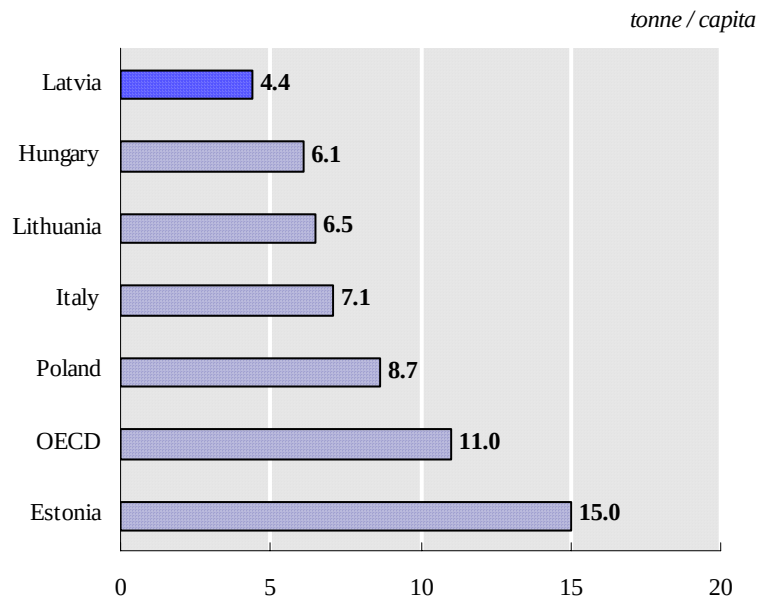
Source: Author calculations, EPR database.

Figure 6.2: Emissions of NO_x, 1995



Source: Author calculations, EPR database.

Figure 6.3: Emissions of CO_2, 1995



Source: Author calculations, EPR database.

The emissions per capita of the typical pollutants SOx, NOx and CO2 in 1995 were in the order of 17 kg, 11.6 kg and 4.4 tonnes, respectively, the lowest among the Baltic States and other countries in transition (see Figures 6.1 to 6.3). Emissions of SOx and CO_2 stood at approximately 40 per cent of the OECD average; NOx at less than 25 per cent.

In a transboundary context, Latvia is one of the few European countries that are net importers of air pollution. According to the model calculations by the EMEP Meteorological Synthesizing Centre-West (MSC-West) for 1986-1995, Latvia imported annually on average 90 kt of SOx, 30 kt of NOx and 3.5 kt of NH_3 more than it exported (see Table 6.2).

The major external contributors to depositions in Latvia are Germany (17 per cent of oxidized N, 15 per cent of S and 5 per cent of reduced N), Poland (17 per cent of S, 12 per cent of oxidized N and 8 per cent of reduced N) and Lithuania (11 per cent of reduced N, 8 per cent of sulphur and 6 per cent of oxidized N).

Sectoral pressures and underlying factors

At present most sectoral pressures at national level come from combustion processes in district heating systems and power generation and from traffic. Latvia has inherited from the former Soviet Union an energy-inefficient centralized heat supply system with more than 100 district heating networks, largely exceeding the country's heat demand. Most are fuelled with heavy fuel oil (HFO) and coal. Ultimately, the modernization of the decentralized heating system with new boilers and heat devices will make for higher efficiency

Table 6.2: Transboundary import/export budgets of air pollutants, 1986-1995

100 tonnes and %

Latvia's territory	Oxidized S	Oxidized N	Reduced N
Export mass *(100 t)*	208	188	163
Exported % of emission	80	95	57
Import mass *(100 t)*	654	266	190
Imported % of depositions	93	96	61
Net import *(100 t)*	446	78	27

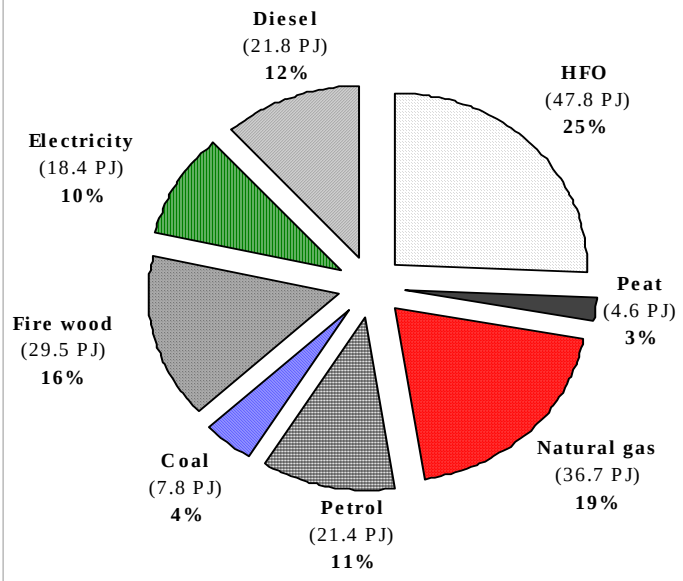
Source: EMEP/MSC-West Report 1/96.

and thus lower heating costs. However, modernization is slow. Consequently, already outdated equipment or boilers continue to be used – requiring ever-higher maintenance costs. Thus costs of heat energy for users of district heat (45 per cent of the population in 1995) continue to grow. In addition, heat energy is not metered.

Most of the electricity (up to 97.9 per cent) is produced by hydroelectric and thermoelectric power stations of LATVENERGO, one of the State monopolies covering at present approximately 50 per cent of demand. The other half is purchased from Estonia, Lithuania and the Russian Federation. The existing thermoelectric power stations generate almost 40 per cent of domestic electricity output. They are also fuelled with imported HFO and coal, and their equipment needs to be modernized.

Primary energy supply has halved since 1990 and solid fuels, firewood, coal and peat have gradually replaced natural gas (see Table 6.3). In terms of

Figure 6.4: Gross consumption of energy, 1996



Source: MEPRD data.

Table 6.3: Fuel supply for combustion processes, 1997

Fuel type	Stationary combustion processes		Energy sector (Heat and electricity)	Industrial boilers
	Tonne	*Toe**	*Tonne*	*Tonne*
Coal	71 923.8	42 089.8	65 674.3	6 249.5
Natural gas	1 049 420.4 a/	944 768.0	1 031 019.8 a/	18 400.6 a/
Diesel	1 316.5	1 362.5	955.6	360.9
Wood	705 275.8	164 399.8	687 681.0	17 594.8
Coke	8.0	4.8	-	8.0
HFO	25 641.2	24 615.6	17 943.1	7 698.1
Peat	335 598.8	..	335 410.1	188.7
Residual fuel oil	713 301.1	707 024.0	651 661.4	61 639.7
LPG	426.5	464.0	395.8	30.7

Source: MEPRD data.

a/ Thousand m^3.

Note:
* Based on average conversion values.

Table 6.4: Energy intensity and pollution intensity of GDP, 1992, 1996-97

		1992	1996	1997
Energy intensity	*(toe/1 000 US$)*	2.3	2.0	2.0
SO_x intensity	*(kg/1 000 US$)*	14.8	20.1	..
NO_x intensity	*(kg/1 000 US$)*	14.0	13.4	..

Source: Central Statistical Bureau of Latvia.

securing energy supplies, the trend to use local resources is welcome, although the use of peat is not increasing. In fact, peat milling has been decreasing steadily in absolute figures, from 1 173 000 tonnes in 1990 to 596 000 tonnes in 1996. HFO continues to be the dominant fuel in the country (see Figure 6.4), and 80 per cent of energy is imported. Pollution by PM containing heavy metals has adverse effects around thermoelectric power stations (vanadium from HFO) and industrial complexes, e.g. at the Liepaja steelworks and the Broceni cement company. Some experts expect that recent developments in the ownership structure of the gas sector will open up new prospects for increasing the use of gas.

The desire to save energy is motivated by the currently high import dependency of the energy supply rather than by environmental concerns. Despite conservation efforts, the overall energy intensity has remained rather stable during recent years, and the related pollution intensity has even deteriorated in the case of SOx (see Table 6.4).

The share of transport and communications in GDP has increased from 7 per cent in 1990 to almost 20 per cent at present. This is to a great extent a result of the decline in production in almost all industrial sectors. Latvia is a transit country thanks to its ice-free ports. Therefore, transit traffic, mainly by rail and road, now almost equal in terms of the total volume of goods transported, is quite intensive and has been constantly rising since 1993.

The diesel locomotives and a big part of the road vehicle stock date from Soviet times. 70 to 80 per cent are more than 10 years old, and most of them fully written-off (see Tables 6.5 and 6.6) and fuel-intensive. In addition, fuel quality is low. Less than half the trucks, trailers and buses have passed the technical inspection (see Table 6.7). Experts estimate that almost 10 per cent of them are not insured. Transport services are, therefore, particularly accident-prone. To complete the picture of the transport sector, the importance of maritime transport should be underlined, as it accounts for almost 20 per cent of goods carried (see also Chapter 11).

Ambient air quality

According to the monitoring data provided by the Environmental Pollution Observation Centre (Latvian Hydrometeorological Agency), the ambient air concentrations of PM, NO_2, SOx and CO did not exceed the Latvian health standards in 1996-1997, although NOx levels reached the 24-hour limit in Daugavpils, Liepaja and Olaine (see Table 6.8). However, the measurements by automatic mobile DOAS (Differential Optical Absorption Spectroscopy) stations, which operate in big cities, but are not yet certified, show that the 24-hour limits for NOx and ozone are regularly exceeded. Compared with the WHO guiding values, PM standards are exceeded in almost all cities and NOx measurements reach their limit (see Table 6.9 for a comparison with the standards laid down in the IPPC Directive of the EU).

The mean annual concentrations of ammonia were up to three times higher than the Latvian standard in Olaine and Liepaja, those of phenol were twice the standard in Riga, Liepaja and Jurmala and those of formaldehyde slightly above the standard in Riga, Olaine and Liepaja. Those of the main heavy metals (Zn, Cd, Pb and Cu) were within the established limits. However, there has been a 2.7-fold rise in the annual concentration of lead in Olaine. There are no reliable data on immissions of such traffic-related pollutants as benzene and benzo(a)pyrene nor on vanadium, whose concentrations may exceed the standards around thermoelectric power stations fuelled by HFO.

Table 6.5: Road vehicle stock, 1995-1998

	On 01-01-1995		On 01-01-1996		On 01-01-1997		On 01-01-1998	
	Number	*As % of total*	*Number*	*As % of total*	*Number*	*As % of total*	*Number*	*As % of total*
Total	368 176	100.0	473 997	100.0	534 769	100.0	596 057	100.0
Trucks	59 386	16.1	68 668	14.5	72 909	13.6	76 771	12.9
Cars	251 593	68.3	331 837	70.0	379 895	71.0	431 816	72.4
Buses	5 269	1.4	5 755	1.2	5 785	1.1	5 977	1.0
Trailers	31 891	8.7	40 976	8.6	45 918	8.6	49 308	8.3
Motorcycles	11 035	3.0	15 792	3.3	18 444	3.4	19 267	3.2
Cars for disabled	111	0.0	259	0.1	328	0.1	337	0.1
Minibuses	8 891	2.4	10 710	2.3	11 490	2.1	12 581	2.1
Number of **registered vehicles** per 1 000 inhabitants	146		189		216		240	
Number of **registered cars** per 1 000 inhabitants	99		133		153		153	

Source: Statistical data of vehicle fleet in Latvia, 1998.

Table 6.6: Number of registered cars according to fuel type and age on 01-01-1998

Number

	Total	of which:			
		Passenger cars	Pick-up	Commercial	Emergency
Total	431 816	425 190	1 083	5 244	294
According to fuel type:					
- petrol	409 127	403 057	943	4 869	253
- diesel fuel	22 397	21 843	140	373	41
- natural gas	112	111	0	1	0
According to age:					
- up to 2 years	6 222	5 776	32	404	10
- from 3 to 5 years	11 680	11 235	96	312	37
- from 6 to 10 years	68 204	65 993	276	1 834	98
- from 11 to 20 years	284 166	281 119	466	2 453	126
- over 20 years	61 365	60 889	213	241	22

Source: Statistical data of vehicle fleet in Latvia, 1998.

Table 6.7: Number of registered vehicles having passed technical inspection, 1998

	Registered vehicles on 01-01-1998		Having passed technical inspection
	Total	*of which:* having passed technic. inspect.	
	Number		*%*
Total	595 720	335 570	56.3
Trucks	76 771	35 182	45.8
Cars	431 816	263 448	61.0
Buses	5 977	2 877	48.1
Trailers	49 308	22 170	45.0
Motorcycles	19 267	4 266	22.1
Minibuses	12 581	7 627	60.6

Source: Statistical data of vehicle fleet in Latvia, 1998.

Table 6.8: Air quality in selected Latvian cities, mean annual concentrations in mg/m³, 1992-1996

City	Pollutant																			
	Particulate Matter					SO_2					NO_2					CO				
	1992	1993	1994	1995	1996	1992	1993	1994	1995	1996	1992	1993	1994	1995	1996	1992	1993	1994	1995	1996
Daugavpils	0.1	0.1	0.1	0.2	0.1	0.004	0.005	0.004	0.003	0.002	0.02	0.03	0.02	0.03	0.04	0.3	0.2	0.2	0.3	0.3
Jurmala	0.1	0.1	0.1	0.1	0.0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Liepaja	0.1	0.1	0.1	0.1	0.1	..	..	..	..	..	0.04	0.04	0.03	0.03	0.04	0.1	0.4	0.5	0.4	0.2
Riga	0.1	0.1	0.1	0.1	0.1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Valmiera	0.1	0.1	0.1	0.1	0.1	0.001	0.001	0.001	0.001	0.002	0.04	0.03	0.02	0.02	0.03	0.5	0.5	0.5	0.6	0.3
Ventspils	0.1	0.0	0.0	0.1	0.1	0.003	0.003	0.002	0.005	0.000	0.01	0.02	0.02	0.03	0.03	..	0.002	0.001	0.002	0.001
Olaine	..	..	..	..	..	0.004	0.002	0.002	0.003	0.003	0.03	0.04	0.04	0.04	0.04	0.004	0.002	0.002	0.003	0.003

Source: Environment Pollution in Latvia, Annual Report 1996.

An analysis of long-term observation results from background stations in Rucava and Zoseni has shown a general decrease in NOx, HMs and nitrate concentrations, by a factor of 1.6 to 4. At the same time, ozone concentrations have gradually increased since 1994, when ozone measurements started, leading to exceedances of the 24-hour national standard in most cases.

Deposition of sulphur has decreased 1.8 times, while that of oxidized nitrogen has remained stable for the past five years, reaching for example 9.50 kg/ha to 13.15 kg/ha at Zoseni stations in 1996. Model calculations show a 1.3-fold decrease in sulphur deposition in Latvia in recent years, with values fluctuating from 8 kg/ha to 29 kg/ha, in no case exceeding critical loads as recommended by UNECE. By contrast, the calculated deposition of oxidized nitrogen, ranging between 10 kg/ha and 14 kg/ha, has exceeded UNECE recommended values for bogs (3 to 5 kg/ha).

6.2 Policy and air management objectives

Legislation and objectives

Air management in Latvia is primarily driven by the following three laws:

- The 1991 Law on Environmental Protection, amended in 1997,
- The 1990 Law on State Ecological Expertise, supplemented in 1993 by the Regulations on the Order of the Organization of State

Table 6.9: Comparison of selected Latvian air quality standards with recommended WHO guiding values and EU present and future standards

Substance	MPC Latvia mg/m³		WHO guiding value / averaging time	EU standards / averaging time	
				Present	According to IPPC Directive a/
	30 mn	24 h			
Carbon monoxide	5.00	3.00	60 mg/m³, 30mn 10 mg/m³, 8h		
Ozone	0.16	0.03	0.120 mg/m³, 8h	0.11 mg/m³, 8h, to protect health 0.2 mg/m³, 1h, to protect vegetation	
Sulphur dioxide	0.50	0.05	0.5 mg/m³, 10 mn 0.125 mg/m³, 24 h 0.05 mg/m³, annual	0.08 mg/m³, annual, b/ median value if BS>40 and 0.12 mg/m³, annual, median value if BS ≤ 40	0.125 mg/m³, 24 h, c/ exceeded not more than 3 times annually to protect human health; 0.020 mg/m³, annual and d/ in winter to protect ecosystems
Nitrogen dioxide	0.085	0.04	0.2 mg/m³, 1 h 0.04 mg/m³, annual	0.2 mg/m³, annual, exceeded not more than 2% time	0.2 mg/m³, 1 h, e/ exceeded not more than 8 times annually (50% margin of tolerance) 0.04 mg/m³, annual, (50% of tolerance) both to protect human health; 0.03 mg/m³, annual, as $NO + NO_2$ to protect vegetation
Particulate matter	0.50	0.15	0.06-0.09 mg/m²	0.08 mg/m³, annual median value 0.13 mg/m³, winter median value 0.25 mg/m³, maximum value not to be exceeded more than 3 times annually	0.05 mg/m³, 24 h, (50% margin of tolerance to protect human health) 0.03 mg/m³, annual, (50% margin of tolerance to protect human health)
Lead		0.0003	0.0005 mg/m³, annual	0.0002 mg/m³, annual	0.0005 mg/m³, annual (100% margin of tolerance)

Source: MEPRD data; WHO Air Quality Guidelines for Europe and EU Directive 96/61 on IPPC.

a/ **IPPC**: Integrated Prevention Pollution Control.
b/ **BS**: Black smoke.
c/ Attainment date: 01-01-2005.
d/ Attainment date: 2 years after entry into force of the IPPC Directive.
e/ Attainment date: 01-01-2010.

- Ecological Expertise of Industrial and Economic Activities, and
- The 1995 Law on Natural Resources Taxes, amended in 1996.

The 1991 Law on Environmental Protection, considered to be an 'umbrella law', did not introduce such basic principles and objectives for air management as sustainable development, BAT(NEEC) and the precautionary and polluter-pays principles. The Law does, however, mention a number of modern features of air management, e.g. environmental quality standards in the form of antrophogenic load norms, limits on the total use of natural resources, and licensing systems based *inter alia* on State ecological expertise.

More policy and air management objectives can be found in other sectoral laws and regulations and also in various policy documents and projects of a strategic nature. The 1997 Regulation on Protecting the Ozone Layer determines the phasing-out procedure for ozone-depleting substances with time schedules for decreasing import and production quotas, both to be ceased after 1 January 2030.

On the other hand, air management is also subject to former Soviet laws and particularly to the 1981 Air Protection Law and related ambient air quality standards, which are still in force for about 400 pollutants, according to the Decision of the Council of Ministers of 1992. They must be revoked by 1 January 1999 at the latest.

To fill the gap, extensive work in line with the Development of the Latvian Approximation Strategy and Programme, project LAT-103 (see section 1.9, Chapter 1), led by MEPRD, is going on and close to completion to prepare *inter alia* draft regulations on air quality standards, emission limit values for combustion plants, standards for fuel quality, and on environmental requirements for petrol station. All are in compliance with EU legislation. This work is carried out with financial assistance from the World Bank. Similar work is going on, but at a much slower pace, with respect to measures against air pollution from motor vehicles, including those in use.

Latvia plans to harmonize its air pollution legal framework with that of the EU soon, obtain approval by the Cabinet of Ministers during 1998, and implement it by the year 2000. Any new air management concept should therefore be based *inter alia* on best available technology (BAT) and related emission limit values (ELV), fewer but more realistic ambient air quality standards and stricter enforcement, including emission monitoring.

The 1995 Law on the Regulation of Entrepreneurship in the Energy Industry and the 1996 Regulations on the Supply and Use of Electrical Power call explicitly for energy efficiency and energy savings and the use of local renewable energy resources.

In January 1997, the Cabinet of Ministers accepted its policy for the power sector. It foresees *inter alia* the construction of new, ecologically acceptable power stations and the purchase of electricity from co-generation facilities, as well as the use of renewable and local sources of energy.

The National Environmental Policy Plan (NEPP) of 1995 sets 10 priorities, amongst them the control of transboundary pollution and risks caused by economic activity and transport in general.

The key goal of the National Transport Development Programme for 1996-2010, accepted by the Cabinet of Ministers in November 1995, is to make transport operations more efficient. Among the main strategic guidelines and tasks for reaching this goal it mentions: establishing environmentally friendly transport systems using high-quality fuel and minimizing the environmental impact of all modes of transport. One sub-programme aims explicitly at drawing up legal documents, at respecting environmental protection regulations, and at controlling all modes of transport accordingly.

Finally, the medium-term plan for the implementation of the EU legislation includes projects on IPPC and vehicle and fuel standards.

Latvia also has international obligations directly related to air management. In 1994 it acceded to the ECE Convention on Long-range Transboundary Air Pollution and in 1997 to the EMEP Protocol. In June 1998 it signed the new Protocols on POPs and on Heavy Metals.

Organization of air pollution prevention and control

The MEPRD is responsible for developing and implementing policies and strategies for air pollution abatement. For transport and traffic-related issues, it is assisted by the Ministry of the Interior and the Ministry of Transport. The MEPRD can rely on several subordinated and supervised institutions to carry out specific tasks:

- The Environmental State Expertise Board assesses projects that could affect air quality at the national level.

- The eight Regional Environmental Boards control and enforce legislation and regulations in their regions in order to prevent and limit air emissions and assess the environmental consequences of projects of lesser scope. They monitor compliance with emission norms and related mitigative measures imposed during the licensing procedure. They collect information on emissions from polluters and check its quality before sending it to MEPRD. Their role is crucial in determining pollution charges and fines collected by regional fiscal services. A typical REB consists of an expertise division, an inspectorate and a laboratory, altogether staffed with 25 to 30 employees.

- The Environmental State Inspectorate controls compliance with the air pollution abatement policies on the country's territory, requests relevant information for instance on emissions *inter alia* from REBs.

- The Latvian Hydrometeorological Agency collects and disseminates air pollution data via its Environmental Pollution Observation Centre, including transboundary impacts. It

operates an air monitoring network, including two EMEP stations.

- The Environmental Consultancy and Monitoring Centre prepares and disseminates information on the state of Latvia's environment, using and analysing data from many institutions, including the Hydrometeorological Agency and the Environmental Data Centre. It is also responsible for developing the monitoring network.

- The Environmental Data Centre is responsible for preparing the national emission inventory. It compiles, processes, manages and finally reports on emission data in the country, cooperating closely with REBs and the Environmental State Inspectorate.

In general, municipalities are responsible for environmental protection within their jurisdictions and should support the activities of MEPRD. In practice, they are primarily active in waste management and water supply. Their interest in air protection is limited to monitoring air quality, e.g. in Riga, and to deciding on the location of potentially polluting activities.

Available instruments and their application

At present air management in Latvia is partly based on new command-and-control mechanisms combined with economic instruments, as stipulated in Latvia's post-independence laws. Air pollution permits are required for stationary sources on the basis of the 1990 Law on State Environmental Expertise. They are issued by MEPRD and its Regional Boards, if a simple dispersion model proves that ambient air quality standards are met. Permits, containing emission limits and related mitigation measures, are first issued as temporary permissible emissions (TPE) and finally as regular permits of a duration of up to 5 years, called maximum permissible emissions (MPE).

As the Law on the Protection of the Air, which dates from before the restoration of independence, does not contain any control obligation, air quality standards can always be met by better dispersion rather than by introducing control techniques, which at best are limited to very basic, inexpensive and relatively inefficient devices. Thus, at current production levels, hardly any enterprise has difficulties meeting MPE. This considerably facilitates the inspection tasks of REBs and self-monitoring by polluters. Both can therefore rely on mass balance calculations of current emissions rather than on regular and scheduled measurements. In practice, the latter are carried out for basic pollutants only by inspectors and in plants where such measurements are really necessary, as the sources of pollution, including thermoelectric power stations, are not equipped for them.

The Law on State Environmental Expertise does not specify to what type of stationary source or to what level of emissions the related licensing applies and does not explicitly involve the public in the assessment process. The new Law on EIA is based on relevant EU Directives. As a result, transport enterprises avoid licensing at present, although vehicles as such are subject to control, but not yet to type approval. Such approval may be introduced in 1999, but is planned only for vehicles imported

Table 6.10: Exhaust emission standards

Vehicle type	Implementation year	Standard / Regulation	Comments
Spark ignition-engined:			
Vehicles without catalytic converter	1/1/83	CO (% vol) 3.0 CH (ppm) 1 200	At minimum idle speed
Vehicles with catalytic converter	1/1/89	CO (% vol) 0.5	At engine speed at least 600
Diesel-engined vehicles:		Smoke opacity	
Naturally aspirated engines	1/1/89	40 (%)	Free acceleration smoke test
Turbo charged engines		50 (%)	

Source: Regulations on Technical Conditions of Transport Vehicles, Ministry of Transport, 1995.

from the ECE region, with stricter rules for vehicles from the EU.

The technical requirements for transport vehicles inspired by EU legislation are contained in the Regulations on Technical Conditions of Transport Vehicles, approved by the Ministry of Transport in 1995. They impose roadworthiness tests on passenger cars and heavy-duty vehicles (HDVs) annually, and on city buses and touring coaches twice a year. The tests are carried out in 29 inspection stations of the Road Traffic Safety Directorate, a State-owned non-profit joint-stock company. The technical requirements include compliance with exhaust emission standards for CO and smoke opacity and partly for hydrocarbons (see Table 6.10). In practice, only the CO content is checked at all stations; other standards are checked only in Riga and recently in Liepaja.

According to statistics, 44 per cent of vehicles in Riga and 28 per cent in the country as a whole failed the pollution test first time round during the first half of 1997. The number of vehicles that have not passed the technical inspection at all is alarmingly high, e.g. 39 per cent of passenger cars (see Table 6.7). In addition, spot checks of in-use vehicles are carried out only sporadically at local level, due to the lack of cooperation between the Road Police and REBs and the lack of equipment.

A more satisfactory situation exists with respect to air quality monitoring, which has been carried out by Hydrometeorological Agency for many years. The Agency is responsible for programme coordination, database management and maintenance, local sampling, chemical analyses and reporting to the Environmental Consultancy and Monitoring Centre. The national air pollution observation network consists of 11 stations located in eight major cities and other points where transboundary pollution is measured. Samples are taken 3-4 times a day to analyse concentrations of such common pollutants as SOx, NOx, CO and PM and once a month for selected pollutants like ammonia, formaldehyde, inorganic acids and heavy metals, depending on the emission pattern in the sampling area.

Two background stations in Rucava and Zoseni, integrated within several international monitoring programmes, including EMEP, complement the network. At Rucava station, SOx and NOx concentrations are analysed in gases and aerosols, concentrations of heavy metals in aerosols, and those of ozone and NMVOC in gases only. At Zoseni station, the observation programme excludes for the time being surface concentrations of ozone and NMVOCs. The stationary measurements are supplemented by mobile sampling and analyses in Daugavpils, Liepaja and Ventspils to detect pollution peaks caused by local industry. In addition, at seven meteorological stations precipitation chemistry and snow samples are analysed to determine acidity and nitrate, ammonia and heavy metals content.

In 1996, 28 000 and 3 530 samples were taken respectively at network stations and by mobile samplers. Automatic measurements have been taken in Riga since 1993, based on the Swedish DOAS system. They are being extended to other cities, e.g. Ventspils, but the results are considered unofficial as the system and methods are not compatible with former Soviet regulations that are still in force, and the equipment has not yet been certified by MEPRD.

There are few economic instruments to enforce air management in Latvia. The most widely applied are emission charges and fines (see Table 6.11) and excise duties on fuels (see Table 3.3). 40 per cent

Table 6.11: Base tax rates for air pollution, as of 17-06-1997

No	Classification of pollutants emitted according to their environmental hazard	Unit of measure	Rate (Ls)	Examples of pollutants
1	Non-toxic emissions	Tonnes	3.00	Particulate matter
2	Medium dangerous emissions	Tonnes	4.50	Carbon monoxide
3	Dangerous emissions	Tonnes	10.00	Sulphur dioxide, nitrogen oxides, NMVOCs, ammonia
4	Highly dangerous emissions	Tonnes	800.00	Heavy metals

Source: Latvian Energy News, December 1995.

of pollution charges (taxes) are transferred to the State's special environmental protection budget (the State Environmental Protection Fund, SEPF), while 60 per cent go to the local budget of the county or municipality where the activity is located. Fines, which may exceed charges 3 to 12-fold, are transferred in full to the State Environmental Protection Fund.

An analysis of the charges shows that they are not high enough, particularly for the emission of common pollutants. They are also not indexed. Polluters planning to introduce control techniques can obtain a 'tax allowance', often transformed into a 'tax credit' when construction has not been completed. Moreover, the law limits 'taxable objects', excluding transport companies and such air-polluting products as solvents, paints, varnishes, etc. as they are not specified in the list. The charges amount to less than 1 per cent of the budget of a polluting enterprise.

The range of excise duties, particularly those imposed on leaded and lead-free petrol, does not seem large enough, and their period of application too short to have produced a positive environmental impact. The vehicle stock continues to run on leaded petrol and diesel. The latter has only one excise duty level, which means that the promotion of environmentally friendly 'city diesel' and other eco-fuels like CNG, LPG has been largely ineffective.

Environmental expenditures are generally very low, not exceeding US$ 4 to 5 million annually. In 1996 capital investments in air protection reached 14.5 per cent of the total, but in monetary terms they totalled only US$ 250 000, i.e. a level far below that of one medium-capacity flue-gas desulphurization (FGD) plant. Even this low level was mostly financed from enterprises' own resources, and not from the Environmental Protection Fund. Accordingly, no combustion process is currently equipped with such commonly used secondary measures as FGD or deNOx facilities. Only the most basic primary measures like flue-gas recirculation into combustion air are applied.

The situation seems to have improved in 1997, when general expenditures from the Environmental Protection Fund for air protection stood at 6 per cent (see Figure 3.2), with 10 per cent of the funds collected spent on improving the equipment of environmental institutions. However, capital investment data are not yet available for 1997 to confirm the apparent increase in air protection investments.

The situation may further improve when the newly created Environmental Investment Fund will be fully operational (see Figure 3.3). It can help to finance such important programmes as cleaner production, completely neglected at present, and energy-saving and energy efficiency projects (such as development of advanced technologies like co-generation of combined heat and power plant (CHP)), small-scale CHP and modernization of district heating systems), including those projects that promote renewable energy resources, mainly woodchip and peat, for individual and local heating. Such investments are particularly welcome, as current public investment programmes focus exclusively on sewage infrastructure, waste-water treatment and landfills (see Chapter 3, section 3.3).

The lack of environmental funding is also highly visible at regional and local levels, possibly proving that the decentralization process did not yield the expected results. Monitoring station equipment is sometimes borrowed from foreign countries; operation costs are covered by the municipalities.

6.3 Conclusions and recommendations

Latvia's strategic target is the approximation of its legal and institutional system to that of the EU. Its approximation strategy and action plan for integration into the EU are being worked out in detail. It can therefore be expected that the national approximation priorities increasingly need to be reflected in present air management practices. The priorities in this respect for air management appear to relate to the determination with which already existing instruments are applied for the purposes of pollution abatement, the integration of environmental concerns into sectoral strategies, their impact on transboundary problems, and the facilitation of the use of air protection instruments at all levels of administration. In addition, accompanying measures to raise awareness and disseminate information appear necessary.

As the necessary adaptation of the laws and regulations remaining from the Soviet period takes time, there is a kind of 'environmental management vacuum', particularly at the regional level. Also, enterprises do not seem to take any initiative to cut pollution, leaving it up to the REBs. This situation

requires the particular attention of the MEPRD, which should be encouraged to use all available measures to combat excessive air pollution.

Recommendation 6.1:
The Ministry of Environmental Protection and Regional Development should use all regulatory or control instruments that are currently directly available for combating air pollution (spot checks of vehicles, checks of fuel quality, certification of monitoring equipment, review of criteria for use of funds for financing protection measures at the local level) to the maximum possible extent. In addition, the Cabinet of Ministers should issue a normative act related to ambient air quality standards, as Soviet standards will be revoked before those adapted to the EU will enter into force.

The above immediate measures need to be complemented, in the medium term, with the development of a comprehensive action plan. Based on a critical review of NEPP, the National Transport Development Programme, the Government Policy in the Power Sector and the Convention on Long-range Transboundary Air Pollution and their present implementation, the medium-term environmental action plan should include transport- and energy-related issues. These issues should be approached in the context of intermediary (i.e. while the approximation process lasts) air protection targets (emission ceilings, ambient air quality, etc.).

Recommendation 6.2:
A medium-term action plan should be developed. It should specify targets for air protection and should include energy- and transport-related issues. Its development should be led by the Ministry of Environmental Protection and Regional Development, but should include all line ministries concerned, industry, NGOs, as well as local administrations. The promotion of public transport should aim at reducing urban air pollution.

Transport and energy policies are environmentally driven at the conceptual level. However, they are clearly at variance with ambitious sectoral development and modernization plans, which are in their early stages. Road vehicles, navigation vessels and diesel locomotives in operation contribute substantially to pollution. The inventory of environmental problems caused by maritime traffic and rail transport has only just started, as has that of concerns with thermoelectric power stations and other stationary sources, where, however, the permits provide a sufficient source of information.

A number of measures will become necessary to mitigate the undesirable effects of transport and energy developments on air quality. The reduction and eventual discontinuation of the use of leaded petrol by 1 January 2005 appear to be top priorities, in line with the Aarhus Protocol on Heavy Metals and the Aarhus Declaration on the phase-out of added lead in petrol, which Latvia has recently signed.

Recommendation 6.3:
The use of leaded petrol should be further discouraged, primarily with economic instruments. Its use should be discontinued at the earliest possible time, but not later than 2005.

Changes also seem to be necessary in the funding of environmental investments in the power and transport sectors. In general, the financial basis for implementing structural changes in the transport and energy sectors and control programmes in industry should be extended to new (economic) instruments related to for instance polluting goods and activities. For example, excise duties could be differentiated depending on the pollution potential of fuels, and the rates of the present pollution charges and fines could perhaps be increased and also indexed (see also Chapter 3). In any case, environmental investment programmes should be extended to the transport and energy sectors, starting with some of the most urgent investment projects.

Recommendation 6.4:
The participation of environmental investment programmes in funding projects in the energy and transport sectors should be considered (i.e. promoting environmentally sound energy sources, improving thermal insulation, installing heat meters, modernizing public transport in the main cities, etc.).

Improvements in managerial effectiveness require some streamlining and clarification of competencies. This concerns primarily the inspection activities of Environmental State Inspectorate and REBs, leading sometimes (for instance, in the case of national and city monitoring in Riga) to a duplication of their efforts or, alternatively, inaction (for example, in the case of roadside control of vehicles) and secondly the centres involved in monitoring activities (Hydrometeorological Agency, Environmental Data Centre and Environmental Consultancy and Monitoring Centre), leading to incomplete information (e.g. not including emission and

immission data in one publication) and restricted access for the public to air quality information. There is also a general impression that line ministries, REBs, enterprises and municipalities are not sufficiently involved in the environmental approximation process. Municipalities are also not generally consulted when new laws and regulations are drafted.

Air monitoring data should include parallel processing of emissions and ambient air levels and be concentrated in one institution to ensure objectivity and wide dissemination, e.g. a scientific body independent from MEPRD. At present none (Hydrometeorological Agency, Environmental Data Centre or Environmental Consultancy and Monitoring Centre) can perform such tasks, although the Environmental Pollution Observation Centre within the Hydrometeorological Agency seems to be the best prepared for such responsibilities. Municipalities should be encouraged in this connection to undertake public information campaigns regarding the quality of urban air and its protection. Currently, air quality information is not disseminated via the mass media, and the Hydrometeorological Agency's bulletin is addressed to professionals. On the other hand, the efforts to popularize the Environmental Consultancy and Monitoring Centre's publications have been successful and are a step in the right direction.

Recommendation 6.5:
The sharing of air management responsibilities between different administrations should be reconsidered from the points of view of optimal coordination (e.g. of environmental inspections) and of public access to environmental information.

Latvia should accede to the protocols to the Convention on Long-range Transboundary Air Pollution aimed at reducing SOx, VOC, heavy metal and POP emissions and take an active part in the final negotiations of the protocol to reduce emissions of nitrogen compounds and related substances and sign it. Latvia recently acceded to the Convention on EIA in a Transboundary Context, and should now consider accession to the 1958 Agreement concerning the Adoption of Uniform Conditions of Approval and Reciprocal Recognition of Approval for Motor Vehicle Equipment and Parts and other related UNECE regulations. These steps would be instrumental to the EU approximation with regard to air pollution.

Recommendation 6.6:
Compliance with environmentally relevant ECE conventions and protocols should be attempted, particularly in those cases where they are instrumental to the EU approximation process. Latvia should also adhere to the 1958 Agreement concerning the Adaptation of Uniform Conditions of Approval and Reciprocal Recognition of Approval for Motor Vehicle Equipment and Parts and to other related UNECE regulations as well as to the corresponding instruments at the global level.

Chapter 7

WATER MANAGEMENT

7.1 Quantity and quality of water resources

Surface waters

Latvia has a large surface water network due to its uneven moraine relief, its wet climate and the peculiarities of its geographical structures (Figure 7.1). There are about 12 400 rivers and brooks in Latvia with a total length of over 37 000 km. Four large rivers - the Daugava, the Lielupe, the Gauja and the Venta - account for 88 per cent of its total river discharge (Table 7.1) and are part of the Baltic Sea basin. The annual river discharge is 34.7 km^3, which amounts to almost 8 per cent of the total river discharge into the Baltic Sea. 44 per cent is local discharge, about 56 per cent are transit waters from Lithuania and Belarus. Latvia has 34.0 km^3 of surface water and 4.7 km^3 of groundwater resources available annually.

Latvia's river water regime is characterized by spring floods and low water periods in late summer, as well as periodic summer falls and winter rises in water level. During the spring floods, rivers transport about 45-55 per cent of the total annual water volume. About 35 per cent of Latvia's rivers that are 10 km or longer are partly or fully regulated.

Table 7.1: Characteristics of main rivers

	Length		Catchment area		Annual mean discharge
	Total	In Latvia	In Latvia	Share of Latvia's total surface	
	(km)		*(km^2)*	*(%)*	*(m^3/s)*
Daugava	1,020	357	24,700	38.2	720
Lielupe	119	17	56	13.6	104
Gauja	452	452	7,790	12.1	74
Venta	346	178	7,900	12.2	93

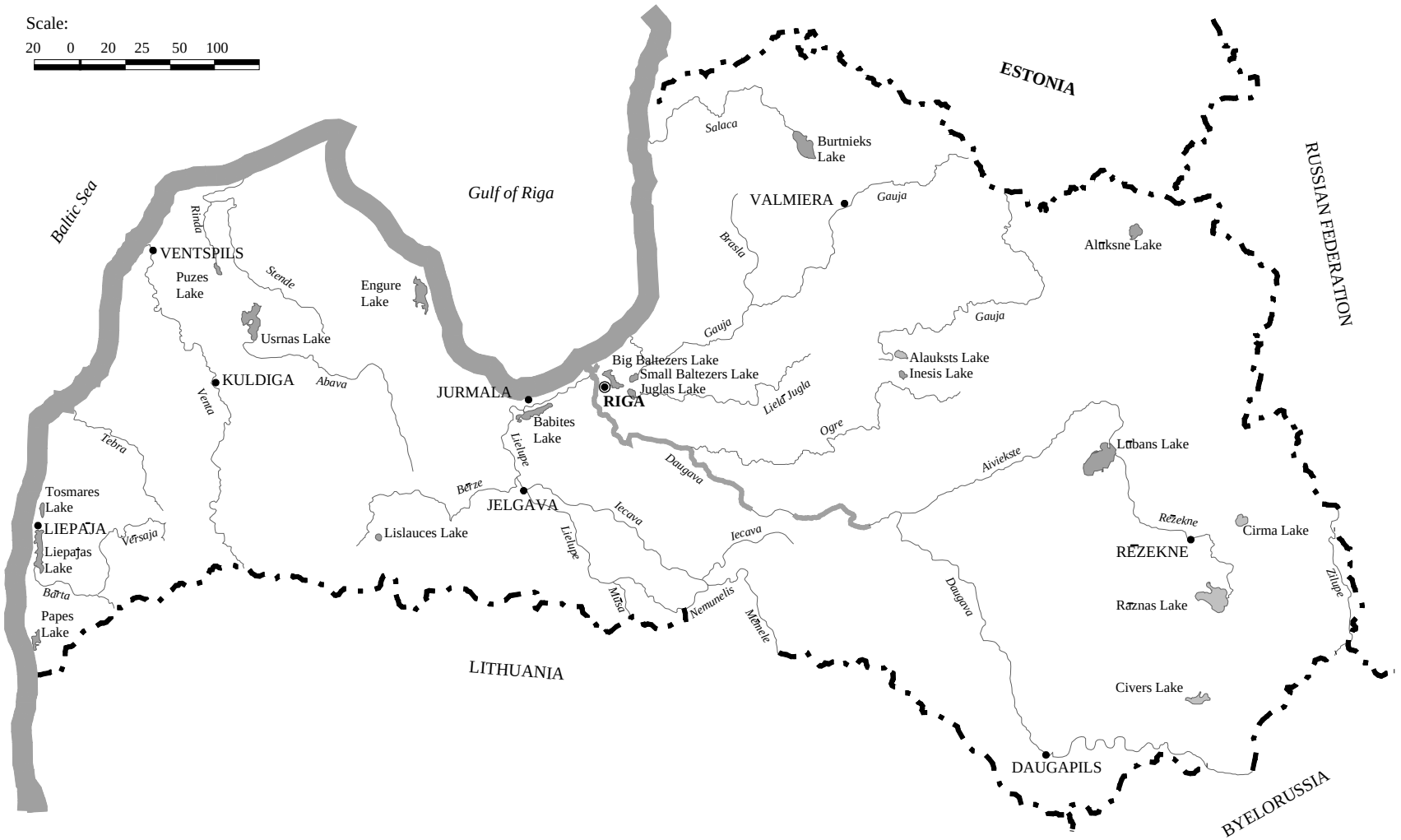
Source: Hydrometeorological Agency, 1998.

Table 7.2: Latvian rivers according to their length

River length	Number
Total	12 436
Shorter than 10 km	11 659
10 to 20 km	501
20 to 50 km	209
50 to 100 km	50
Longer than 100 km	17

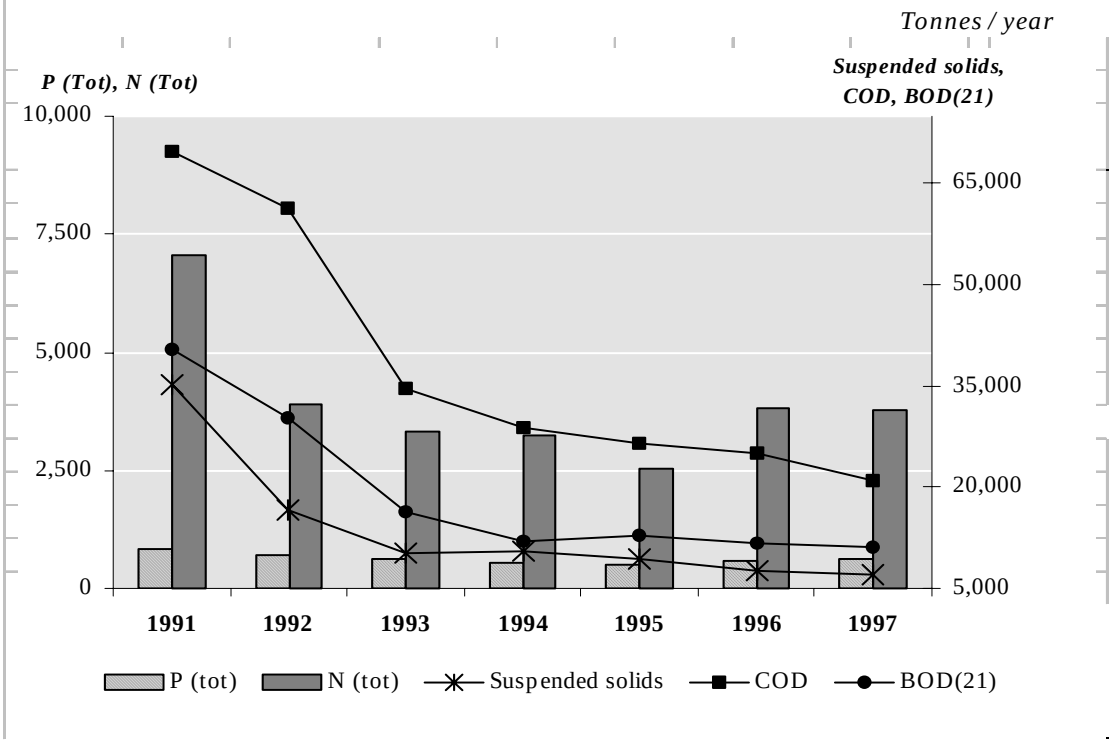
Source: State of the Environment Report of Latvia, 1996, ECMC.

Figure 7.1: Latvia's main rivers and catchment areas



Source: Encyclopaedia "Latvian Nature", 1995

Figure 7.2: Pollution load by the river network in Latvia, 1991-1997



The Dobris report (European Environment Agency, 1995) described the water quality of 80 per cent of Latvia's rivers in the early 90s as 'good' and 'fair', that means: insignificant pollution, moderate nutrient content, sufficiently high oxygen amount, rich flora and fauna, large fish population. Since then, the pollution load has fallen further (see figure 7.2). The drop has been particularly clear for suspended solids, COD and BOD, more limited for phosphorus and nitrogen.

River conditions in terms of organic substances do not vary much throughout the year, the annual average being 1 to 2 mg/l $BOD_{7,}$ 1.5 to 3 mg/l N_{tot} and 30 to 120 µg/l P_{tot}. However, the total nutrient concentration shows some significant trends. The summer and autumn concentrations of total phosphorus (100 to 200 µg/l) and the spring concentration of total nitrogen (6 to 8 mg/l) in the river Lielupe are high. There is no definite and convincing explanation for this. However, the Musa, one of the main tributaries of the Lielupe, crosses the Lithuanian border with an autumn P_{tot} concentration of up to 250 µg/l and with a spring N_{tot} concentration of between 4 and 7 mg/l. Due to a lack of comprehensive monitoring data, it is not possible to evaluate the trend of the transboundary pollution load from Lithuania. The P_{tot} concentration in the river Venta is remarkably high as well, most likely due to the impact of waste-water discharges from Kuldiga.

The Latvian Environmental Data Centre has investigated the macro-zoobentos of about 200 small rivers (with about 500 observation points) over the past three years in co-operation with the Regional Environmental Boards. The biological water quality in 83 per cent of the rivers has proved to be 'good' or 'fair'. In the Valmiera region, 45 per cent of the small rivers can be classified as clean or nearly clean. The influence of point sources on the biological water quality was assessed at one third of the observation points. About 40 per cent of the point sources have a significant impact on biological water quality and cause changes in saprobic conditions.

Municipal waste water was the main source of phosphorus pollution in Latvia's rivers (44 per cent of the total phosphorus discharge) and agriculture was the main source of nitrogen pollution (68 per cent of the total nitrogen discharge) in 1990. Since then, the use of fertilizers has decreased by more than 85 per cent (Table10.2), while, in 1995, the nutrient load of municipal and industrial discharge was 40 per cent (total phosphorus) to 56 per cent (total nitrogen) lower than in 1991. However, the nutrient load measured in the water remains practically unchanged.

Table 7.3 : Permanent water pollution by river basin, 1997

tonnes / year

	Suspended matter	BOD full	P total	N total	Sulphates	Chlorides
Total	**7 064**	**11 142**	**626**	**3 783**	**4 924**	**6 075**
Bârta basin	25	32	2	11	82	11
Daugava basin	3 400	6 742	200	1 282	741	1 613
Gauja basin	2 762	2 722	253	1 293	533	2 196
Irbe basin	-	-	-	-	-	-
Lielupe basin	168	564	60	529	969	400
Nemuna basin	0	0	0	0	-	-
Pernava basin	7	3	2	10	-	-
Salaca basin	32	45	4	28	-	-
Sur Emajegi basin	12	18	1	4	-	-
Upava basin	1	2	0	1	-	-
Velikaja basin	16	13	3	12	-	-
Venta basin	125	293	33	191	-	-
Baltic Sea's coast	388	338	47	292	2 579	1 587
Gulf of Riga's coast	128	370	21	130	20	268

Source: Indicators of Environmental Protection in Latvia 1997, Statistical Bulletin, Riga 1998.

Latvia also has many *lakes* (more than 2 000), but most are small and shallow. The average depth of about 70 per cent of the lakes is less than 5 m. Only 16 lakes exceed 1 000 ha or 10 km^2; they account for 42 per cent of the total lake area (963 km^2). Latvia's lakes contain a total of about 2 billion m^3 of fresh water. All hydrobiological types of lakes are represented.

Lake water quality is difficult to describe as there is no comprehensive lake monitoring programme. However, the Institute of Biology (University of Latvia) has studied several lakes. In 60 per cent of a random sample of 70 lakes the concentration of nitrates and in 31 per cent the concentration of phosphates exceeded the natural background level. The accumulation of nutrients from different sources has speeded up eutrophication during the last 30-40 years, which is a threat especially to those species that require nutrient-poor water habitats. Toxic blue algae have bloomed regularly in recent summers in the big shallow lakes surrounding Riga - Kisezers, Lake Jugla, Big and Small Baltezers (they provide some of Riga's drinking water). Lake Engure, one of the biggest shallow coastal lakes in Latvia, which has been on the Ramsar list since 1995, has a summer surface concentration of nutrients exceeding the background level - mineral nitrogen 1.2-1.6 mg/l, mineral phosphorus 0.09-0.2 mg/l (12 samples in 1995). However, the lake is still insignificantly eutrophic. In spite of this, the water quality of the other 40 per cent of the lakes still shows no sign of human impact. The bog lakes of Teici and Krustkalni Reserve are virtually unaffected by direct human impact.

In 1992-1994, the Institute of Biology also analysed the concentration of heavy metals in the top layer of lake sediments (0-2 cm). The concentration is low, except for cadmium, which is higher than 1 mg/kg in 30 per cent of the lakes. The source of this pollution is probably the intensive use of fertilizers in previous decades, or the accumulation of organic sediments due to eutrophication.

Groundwater

Latvia is located on the Baltic artesian basin formed by aquifers of different thickness, water amount and water quality. Groundwater from Quaternary (Devonian) deposits, which are 100 to 300 metres deep, is used for water supply. As a result of the continued and intensive exploitation of groundwater resources locally (abstraction significantly exceeds the natural regeneration of reserves), two large depressions have formed: at Liepaja and in the water abstraction area of Riga city and region. In Liepaja, the groundwater level had fallen 15-18 m, and in the Greater Riga region it had fallen 15 m (1996). Such pits create hydraulic preconditions for infiltration of polluted water into artesian water. So far, the Daugava's bottom waters have infiltrated the central part of

Riga's aquifer and marine water has infiltrated Liepaja's aquifer over an area of 3x5 km.
Regarding the chemical composition of groundwater:

- The calcium hydrogen carbonate groundwater type, with a mineral content of 0.3-0.4 g/l, is the one most used in Latvia. Calcium hydrogen carbonate waters usually meet the quality requirements for drinking water. Individual components may nevertheless pose problems, such as a high iron content (usually 0.3-3.0 mg/l), which is the most typical problem.

- Groundwater of a lower quality is found near the surface in Quaternary marine, old river bed and wetland deposits that are rich in muddy sediments. In such groundwater, an increased content of organic substances is found: C_{org} up to 80 mg/l, ammonia up to 30 mg/l, and iron at a concentration of 90 mg/l.

- Sub-surface groundwater of a higher quality is found in sand deposits. Mineralization is very low (0.16 g/l on average), as is the concentration of organic acids (C_{org} = 1-2 mg/l), iron (0.1-0.2 mg/l) and manganese (0.05-0.07 mg/l).

- Calcium sulphate waters are rarer. They are most widespread in the central and western part of Latvia. Water mineralization can reach 3 g/l. Waters with a mineralization of up to 900 mg/l and a sulphate content of up to 400 mg/l are used at the water extraction sites of Liepaja and Jurmala. They are less suitable for the supply of drinking water due to their increased hardness (up to 10 meq/l). Their sulphate content fails to meet WHO standards (< 250 mg/l). However, those cities currently do not have a better water source.

The overall quality of groundwater in Latvia is good. Groundwater pollution of agricultural origin is not as high as in much of western Europe. The nitrate content at groundwater monitoring sites very seldom exceeds 20 mg/l. There may be localized groundwater pollution problems. For example, in the district of Adazi, where agro-chemicals were used intensively, at the end of the 1980s nitrate pollution was found in half the 50 tested water wells, with concentrations between the natural background level (4.5 mg/l) and the Latvian limit value of 45 mg/l. It is also likely that in such areas as those surrounding the Bauska and Ulbroka pig farming complexes (Figure 10.1 in chapter agriculture), where nitrate concentration in drainage water reaches 164 mg/l and total phosphorous up to 2.6 mg/l, groundwater is polluted too. At other locations the chemical content of groundwater has been found to differ radically from the natural one, in particular in the vicinity of solid waste disposal sites (Getlini in Riga, Kudra in Jurmala, Demene in Daugavpils), liquid toxic waste ponds (Olaine, Incukalns, Jelgava), agrochemical warehouses (Iecava, Ventspils, Jelgava), oil storage sites (Jaunmilgravis, Tukums) and former Soviet military bases (Spilve, Factory No 177 in Riga).

Wells are generally more heavily polluted than sub-surface groundwater, due to the sanitary conditions around the wells. A research project on water well quality performed during 1992-1994 indicates that 17 per cent of wells are polluted with nitrates and nitrites (nitrate > 45 mg/l). In 6 per cent of wells, saprobic bacterial pollution was found. Most pollution occurred in small towns and villages, less on individual farms

To summarize, in general potable groundwater in Latvia has a high iron and an insufficient fluoride content. About one third of all water wells fail to meet WHO standards for iron. Even though iron is not a toxic element, an increased iron content (0.8-3.0 mg/l, WHO norm: < 0.3 mg/l) worsens the visual and organoleptic properties of water. At present, iron removal facilities exist at only 74 locations out of the 272 where treatment is needed, and this treatment is satisfactory at only 21. Significant improvements are needed. Also, the fluoride content (0.4-0.5 mg/l, WHO norm: > 1.5 mg/l) is insufficient and increases the risk of dental caries. Other chemical substances do not exceed the norms recommended by WHO for sources of drinking water, except in places (see above) where sodium chloride (from marine waters) has been found with a mineralization of up to 3.6 g/l. According to its micro-biological indicators, groundwater quality is generally good, and additional disinfection is not necessary.

Marine waters of the Gulf of Riga

The Gulf of Riga has a surface of 19 000 km^2, and a water volume of 430 km^3. It is quite deep (about 50 m) in the middle and much shallower to the north. Depending on the hydro-meteorological conditions, about 25 per cent of its total water volume is exchanged during one year. The average

discharge of Latvia's rivers into the Gulf of Riga is about 29.1 km^3, in wet years up to 41.5 km^3 and in dry years about 17 km^3. At the beginning of the 90s this contributed more than 17 per cent of the total nitrogen and up to 5 per cent of the total phosphorous load discharged into the Baltic Sea.

Between 1948 and 1994, discharges of nitrates increased significantly, particularly during the period of intensification of agriculture from 1960 to 1980. At present, according to pollutant input calculations, the nitrogen load to the Gulf of Riga would be expected to fall. But based on river pollution load calculations, the nitrogen load does not seem to be changing significantly (see figure 7.2). In the Gulf, nitrate concentrations peaked in 1989 and 1991, and dropped in 1993 and 1994. Whether this indicates a new trend cannot be decided with certainty due to insufficient data.

Phosphorus is the limiting factor for eutrophication in the Gulf of Riga; this means that the phosphate supply limits algal blooms in spring. Nitrate is not completely consumed during that time. The winter values, which are little affected by eutrophication, are a better indicator of nutrient concentration trends. For the period of 1974-1995, they seem to indicate still increasing concentrations of total phosphorus.

The increase in oxygen deficit on the bottom layer of the sea stopped during the late 80s. In the past few years, oxygen concentrations did not fall below 1.7 ml/l. Perennial (1977-1995) trend analyses of phytoplankton, zooplankton and zoobentos show that significant structural changes continue to influence the ecosystem, i.e. a decrease in phyto and zooplankton biomass, a modification in zoobentos species and bloom of blue algae.

7.2 Water use and waste water

Water abstraction and use

Of the total water intake of 404 million m^3 in 1997, 167 million m^3 was groundwater and 237 million m^3 surface water. Abstraction rates have shrunk in the last decade (Table 7.4). Latvia's annual water abstraction from natural sources was 162 m^3 per capita in 1997. The level is determined by the economic activity in the region, as well as by the number of households that have piped water. The losses during distribution (the poor state and quality of pumps and pipes causes problems in many systems) may also contribute to the regional differences in water abstraction.

The difference between water use and abstraction is considered to be the water lost in distribution. According to Table 7.4 the losses in the water supply system stand at about 25-30 per cent.

Because of economic recession, water use has fallen since 1991 (Table 7.4). Groundwater use has dropped proportionally in all the aquifers used. One positive result, for example, is that the groundwater depression at the Arukila - Amata water complex has been reduced.

Table 7.4: Water abstraction and use, 1991-1997

Million cubic metres/year

	1991	1992	1993	1994	1995	1996	1997
Water abstraction							
Total *of which*	695	650	513	477	456	428	404
Surface water	352	337	264	239	222	222	196
Underground	303	285	231	217	195	181	167
Water utilization							
Total	596	531	407	370	334	323	295
Public supply	204	188	190	..	173	165	138
Industry *	220	181	105	..	86	..	101
Agriculture **	152	144	57	..	55	..	56
Other	20	16	..	..	..	..	..

* Including energy production.

** Including fisheries.

Sources: Indicators of Environmental Protection of Latvia 1997, Central Statistical Bureau of Latvia, Ri
Latvian Environmental Data Center (1991-1996)

Groundwater is the main source (71 per cent) of drinking water as its quality is generally good. Surface water is predominantly used for industrial, agricultural and fishery needs. Only 29 per cent of drinking water is taken from surface water sources. This is the case in four cities - Riga, Daugavpils, Ventspils and Olaine – where surface water is used as well as groundwater. The total population of those cities stands at more than 1 million. The use of surface water for drinking water supply pushes up treatment costs. Moreover, there is a higher risk of drinking-water pollution in the event of a chemical spill, such as that observed in 1990, when cyanide was accidentally discharged into the Daugava after an accident at the Belarussian Novopolock chemical plant.

Table 7.5: Water use in 1997

in litre per capita and day

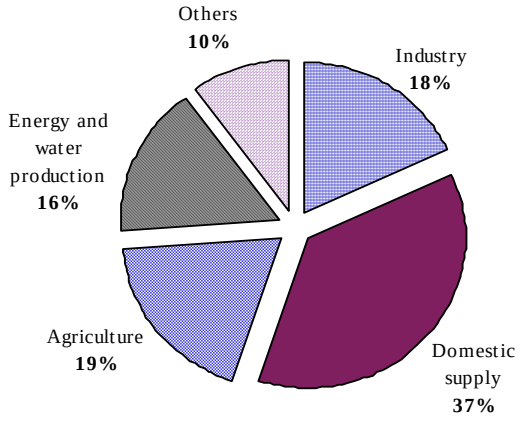
	Total water use	Industrial use	Other (domestic) uses
Total	**326**	**156**	**170**
Cities	367	141	227
of which:			
Riga	377	139	237
Daugavpils	401	200	200
Jelgava	..	..	..
Jurmala	..	..	..
Liepaja	366	209	157
Rezekne	..	..	..
Ventspils	484	117	367
Countryside	284	172	113

Source: Environmental Protection Indicators in Latvia, 1997, Statistical Bulletin, Riga 1998.

In 1997, average domestic water use was 170 l/d/cap., with a lower consumption in the countryside (113 l/d/cap.) than in cities (227 l/d/cap. average in the 7 main towns) (Table 7.5). Water use per capita in Riga amounted to 237 litres per day, in Ventspils to 367 l, in Daugavpils to 200 l and in Liepaja to 157 l. Municipal systems also distribute water to companies and institutions with a water abstraction capacity below 50 m^3 per day (in Riga, below 200 m^3), which also discharge their waste water into the municipal sewage system. About 75 to 98 per cent of the population in large cities and about 40 to 50 per cent in small and medium-size towns are connected to piped water systems. In rural farms and villages, shallow wells are used for individual water supply; the wells are often in poor condition. In general, water use is rarely metered.

In 1997, natural water resources supplied 295 million m^3 of fresh water: 37 per cent of which to the public water supply, 18 per cent to industry (plus 16 for energy production) and 19 per cent to agriculture (mostly used in fish farming) (Figure 7.3). These figures differ significantly from the European averages: 53 per cent to industry, 25 per cent to agriculture, and 19 per cent to households. Figure 7.4 illustrates the water use and waste-water discharge in industry and agriculture. Occasionally, enterprises of one industry treat waste water from others, so that the waste water they discharge into water basins sometimes exceeds the amount of fresh water that they received.

Figure 7.3: Water use by different consumers, 1997



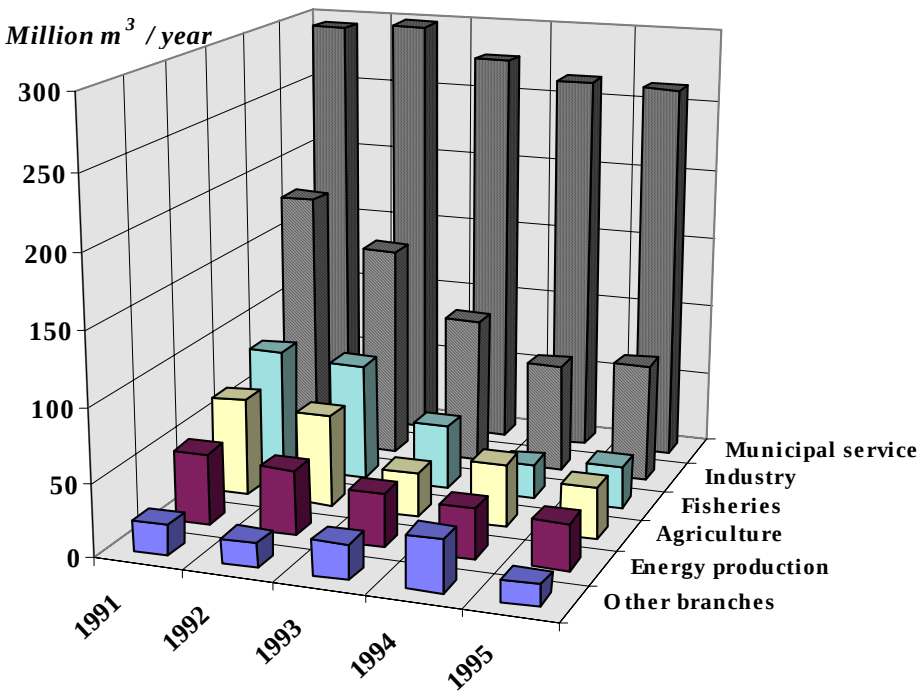
Source: Indicators of Environmental Protection of Latvia 1997, Central Statistical Bureau of Latvia, Riga 1998.

The National Environmental Policy Plan sets the improvement of drinking-water treatment as a priority goal, as the quality of water sampled from water supply systems is questionable (See Chapter 12, Figure 12.2). Measures to improve and modernize the water supply systems and optimize water tariffs are seen as necessary.

Waste water discharges and treatment

In 1997, about 327 million m^3 of waste water from registered point sources were discharged into Latvia's bodies of water. 60 per cent was treated, but of this amount 61 per cent only partially. The municipalities discharged the most waste water:

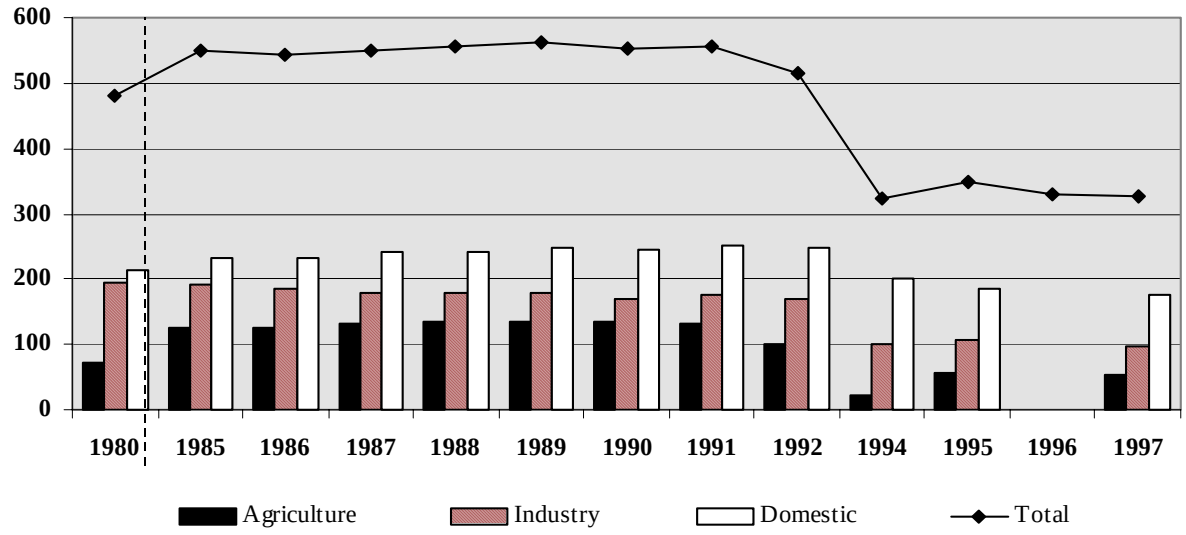
Figure 7.4: Changes in water abstraction by sectors in Latvia



Source: Environmental Data Centre.

Figure 7.5: Generation of wastewater, 1980-1997

Million m³ per year



Sources: Indicators of Environmental Protection of Latvia 1997, Central Statistical Bureau of Latvia, Riga 1998.

177 million m^3, of which 74 per cent partly treated and 26 per cent untreated, half of the latter being relatively clean discharges. Sewer systems in large towns collect waste water from households (communal) and small industry. The second largest producer of waste water is industry: 98 million m^3, of which 56 per cent is treated, about 1 per cent untreated, and the rest relatively clean water (cooling water, rain water, etc). Agriculture is third with 52 million m^3.

Since the early 90s, the generation and discharge of waste water have fallen significantly, mainly due to the economic recession (Figure 7.4). Waste-water discharges fell by 41 per cent between 1990 and 1997. The proportion of untreated waste water also dropped, because the capacity of the facilities was no longer exceeded. In 1997, the 603 physical treatment units were operating at 34% of their capacity; the 981 biological treatment facilities at 49% of their capacity and the 8 chemical treatment plants at less than 10% of their nominal capacity.

In the early nineties, most of the treatment plants already existed but were overloaded or in poor condition. Due to the drop in pollution load and waste-water volume, 1995 experienced decreases of 70 per cent in biodegradable substances, of 54 per cent in nitrogen compounds and of 40 per cent in phosphorous compounds. Within the framework of the Convention on the Protection of the Baltic Sea and its Strategic Implementation Programme, pollution hot spots along Latvia's rivers and coastline were identified. The most important were Riga, Daugavspill and Liepaja, where existing waste-water treatment plants were upgraded. To solve the problem of the numerous small and medium-sized municipalities (about 800) where treatment performances were insufficient, the so-called '800+' programme was launched with EU help. Seven facilities are already finished, 20 are being built and 45 are on the drawing board. Today, about 40 per cent of secondary treatment plants still fail to comply with Latvia's BOD standard and EU discharge requirements, but Latvia is devoting much effort to this issue and progress is swift.

7.3 Water policy objectives and management practices

Priorities for water policy

The Latvian National Environmental Policy Plan (NEPP) lists 10 priority problems. Among them are transboundary water pollution, the eutrophication of watercourses, the degradation of water systems and the poor quality of drinking water. A long list of specific measures is given to solve these problems. At present, as resources are limited, the most vigorous efforts are focusing on reducing the pollution burden from municipalities, which include both households and small industries. A series of measures has been specifically developed to: (i) improve household waste-water treatment and water management technologies, and the technical condition and operation of the sewerage network; (ii) construct new waste-water treatment facilities and expand the sewerage system. Other measures listed in the NEPP will become priorities as soon as resources become available. For all other issues, the EU approximation process sets the pace and the agenda.

Another priority at the moment is the possible setting-up and implementation of water management according to catchment area. Eight big catchment areas cover Latvia's territory. The MEPRD is raising awareness among the local authorities. It is insisting on the necessity of an integrated approach at the catchment area level by the various stakeholders.

The quality of drinking water is also a priority problem in NEPP, in particular for groundwaters with a high iron content.

Legislation

Latvia's environmental law includes two aspects of water protection: extraction and other forms of water use, and protection against pollution. Both issues are regulated in the Water Law of 1972 and subordinated legislation. The function of the 1973 Water Law in the environmental legal system is limited. The Law is complemented by the Natural Resources Tax Law, which provides tools for water taxation. The 1997 Regulations subordinated to this latter Law apply to both water pollution and water extraction. Most important, in practice, are the 1997 Water Use Permit Regulations. They link the permit to both laws in terms of quality and taxation, thereby rendering the adoption of a new law on water less urgent, bearing in mind that a modern law on water will in any case be needed when the IPPC directive is on the agenda.

Property rights to water resources, including water use, are regulated by the Civil Law of 1937. According to this Law, the sea and some specified lakes and rivers are public waters (State property). All other inland waters are in principle private, except if there is no private ownership. However, reserves and restricted areas may be established for certain needs. There is a special procedure for the exploitation of reservoirs and lakes, which is determined in each case.

The Civil Law states that everybody has the right to use water for household needs if it does not harm public interests and does not violate the landowner's rights. Other provisions concern fishing rights in public and private waters.

Moreover, the Civil Law regulates the situation where several landowners depend on the same river.

The Water Law of 1973 applies to all groundwaters and surface waters, including rivers and reservoirs. The Water Law contains certain substantial requirements for water use, water protection, prevention and discharge of harmful water, etc. Water has to be used in a rational way. The Water Law requires a permit for certain uses. In practice, however, the permit requirements are determined by the Regulations on Water Use of 1997. Their goal is to efficiently manage water resources.

The Water Law, which also aims at improving water quality, contains basic and somewhat vague provisions against pollution. The Law does not explicitly cover non-point sources and diffuse pollution.

The above-mentioned water permit covers not only the use but also the pollution of water. The Water Use Permit Regulations focus on the limits on discharges, thus aiming at preventing pollution at the source. The types of activities that need a permit for polluting water are not clearly defined. It can be concluded from the legal context, however, that permits are needed for stationary sources that discharge water, while mobile sources (e.g. ships) and non-point agricultural sources are not included. If waste water is discharged into a municipal sewage treatment plant, the Water Use Permit Regulations do not require a permit. Instead, the developer has to enter into an agreement with the sewage treatment facility. The municipality sets limits and collects fees as agreed (substituting the natural resources tax) (see also Chapter 3).

The 1997 Regulations specify detailed requirements concerning the information that has to be included in the permit application, e.g. the waste-water treatment facility, the source and quantity of waste water, the technological processes, etc. The permits are issued by the Regional Boards. The application is, however, first submitted to the municipality where the facility will be located, and the municipality is involved in the further procedure.

The Regional Boards consider different factors when deciding on the limits:

- Conclusions by the Environmental Expertise Division of the REB,
- Technical condition of the equipment and possibilities for improving it without making large capital investments,
- Conditions of the receiving water body and its self-purifying ability,
- Maximum permissible concentration regulations for waste water (emission standards),
- Performance of water purification at similar waste-water treatment facilities,
- Waste-water purification strategy of small towns in Latvia,
- Quality objectives for surface water according to HELCOM recommendations and EU directives,
- The applicant's current respect for specific requirements and norms and completion of steps provided in a project proposal (plan for environmental improvements).

Pollution and disposal of waste from ships at sea are regulated in the Maritime Code of 1994. In principle, the Code prohibits discharges of waste and other substances at sea, but special discharge permits may be issued by the MEPRD. The Code also determines a procedure to be followed in emergencies and regulates issues of civil liability of nuclear shipping operators and civil liability for the transport of nuclear materials by sea.

The water quality *standards* that were adopted during the Soviet period were quite strict. Standards were set for sub-surface and surface waters, and they applied to sea and inland waters. The inland water standards differentiated between lakes and rivers, reservoirs, watermill lakes, small hydroelectric lakes and drinking water. Certain new "water quality objectives" have been drafted according to the HELCOM recommendations and the different EU directives on water quality (fresh water – fishing waters, bathing waters, water for human consumption, drinking surface waters). The Cabinet adopted these standards in 1997. All Soviet standards will be revoked in January 1999. However, in practice, MEPRD has applied HELCOM water requirements since the early 90s.

The Water Use Permit Regulations also define "emission standards" as "maximum permissible concentrations for waste water". *Inter alia*, they determine the type of use, quantity, and dates of water use, precautions, limits on its use and other restrictions. For new facilities, the emission standards and above-mentioned quality standards are immediately binding. For old plants, a more

flexible approach is adopted. In general, a plan for reaching compliance is set up, taking into account several criteria and fixing a time frame for implementation.

Institutions

Many ministries are involved in water management and share various tasks (see Table 7.6). Water protection and planning of water protection falls within the responsibility of MEPRD. According to the Law on Local Authorities (1994), the local municipalities are responsible for water supply and waste-water treatment.

Drinking water quality is the responsibility of the Ministry of Welfare. Its Environmental Health Centre monitors drinking water quality (see Chapter 12).

The Marine Administration, a State institution subordinated to the Ministry of Transport, is responsible for operations in the event of pollution from ships. Any inspector authorized by MEPRD and the Marine Administration has the right to control a ship's oil pollution certificate, which is issued according to international requirements.

Instruments currently in force

Monitoring

In February 1998, MEPRD accepted the Latvian Surface Water Monitoring Programme. Two other monitoring programmes, on groundwater and on marine water, are also being drawn up. These programmes are long-term strategic documents, which will ensure an optimal implementation of the water monitoring system, and good coordination between the numerous organisms involved.

There are monitoring stations for recording the quality of waters in Latvia. They monitor inland, coastal and marine waters. Monitoring is also done at certain major discharge points. The Water Quality Monitoring and Management System samples, analyses, evaluates, forecasts and presents water quality data.

Water quality monitoring of the bigger rivers is mainly based on chemical parameters and is carried out by the *Environmental Pollution Observation Centre* (EPOC) of the Hydrometeorological Agency. The evaluation of hydrochemical water quality of the lower parts of the rivers is based on the monitoring programme at the «*HELCOM*» points: Carnicava (Gauja), Salacgriva (Salaca), Lipsi (Daugava), Kalnciems (Lielupe) and Vendzava (Venta). There are a few more HELCOM points (on Irbe, Saka and Barta rivers). In the past two years, the Environmental Data Centre has conducted biological surveys on several smaller rivers. The water quality in lakes is monitored spot-wise by the Hydrometeorological Agency and the Institute of Biology (University of Riga). There is no comprehensive lake monitoring programme.

The quality of groundwater is monitored by the State Geology Service. When water is used for drinking water purposes, its quality is monitored by the State Department of Environment and Health. There is no programme to monitor the quality of individual wells in rural areas, which represent few users.

The marine ecosystem in the Gulf of Riga has been monitored since the mid-60s, first by the *Baltic Scientific and Research Institute for Fishery* and later by the *Sea Monitoring Centre* of the Hydrometeorological Board. At present, it is monitored by the *Sea Monitoring Department* (Institute of Hydro-Ecology, University of Riga). The information concerning nutrient and phytoplankton concentrations is inadequate, because there are not enough sampling points (3 in winter, 12 in summer) and sampling frequency is too low (twice a year).

Enforcement and economic instruments

The Environmental Protection Inspectorate monitors water pollution on the regional level. The Environmental Protection Law gives certain powers to the Inspectorate, e.g. to carry out inspections. In practice, control is often facilitated because the polluter reports emissions to the Inspectorate.

When permit limits are violated, the Natural Resources Tax provides the most important sanctions. Water pollutants are taxed according to their toxicity and discharged quantities. The basic charge rates are indicated in Table 3.3 of Chapter 3. The rates rose in 1996-1997. If the permit limits are exceeded (extraction and pollution rates), an extra tax is imposed, in addition to the basic tax specified in the Natural Resources Law (see Chapter 3). The extra tax is three times the basic tax. This legal environmental sanction is in practice the most important for extracting and polluting activities. Other possibilities are administrative fines, permit withdrawal, closing of the facility and criminal sanctions. In addition,

criminal and administrative liability applies to cases where limits are exceeded, or water pollution is caused.

Expenditures

Expenditures for water protection surpassed by far environmental expenditures on other issues. Since 1991, they have regularly consumed more than 80 per cent of total environmental expenditures (for details see Table 3.6, Chapter 3). In 1997, 40 per cent of the expenditures of the Latvian Environmental Protection Fund (LEPF) were spent on water protection, and 74 per cent of the Latvian Environmental Investment Fund (LEIF) will be spent on investment in water management in 1998. Lll figures corroborate the priority currently given to the water sector. Investments in the water sector have also increased since 1995, as shown in Figure 7.4.
There are two technical assistance projects in the water sector: a Swedish project "The Latvian Approach to the Water Resources Framework Directive" and the Danish EPA assistance to MEPRD "Approximation of Legislation and Regulations in the Water Sector".

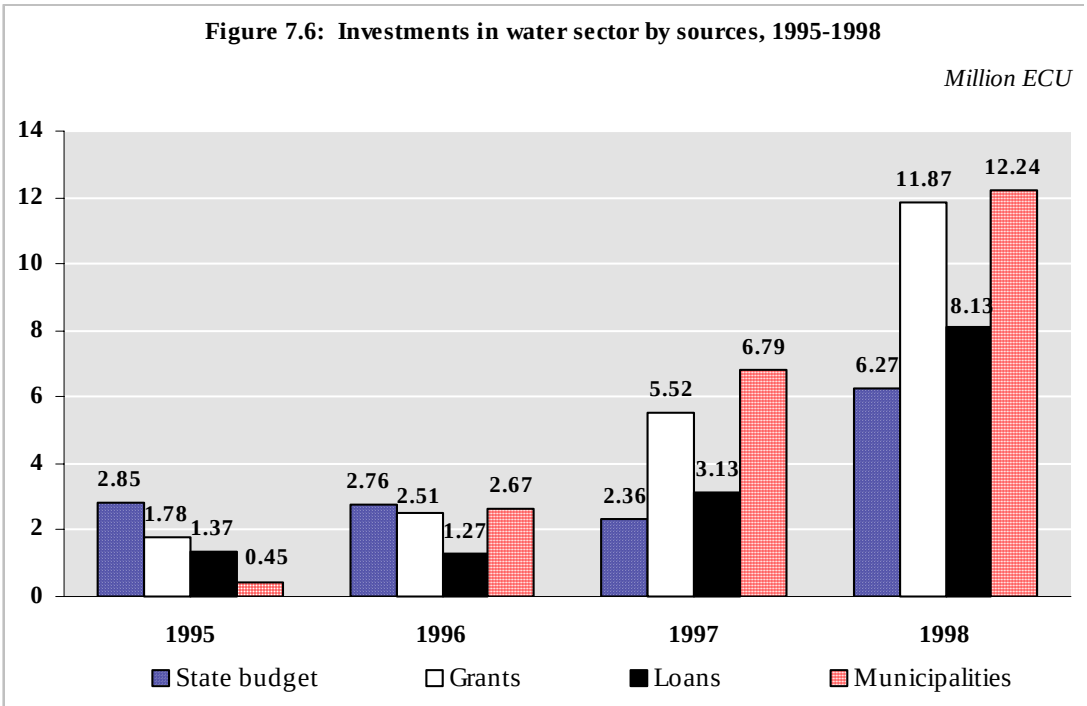
7.4 Conclusions and recommendations

Overall, Latvia is endowed with high-quality waters. Latvia is rich in reserves of potable groundwater. Except for individual localities, it is possible to ensure water supply from groundwater of acceptable quality almost anywhere. Problems of quality arise only from increased iron and reduced fluoride contents, and often from excessive hardness. While insufficient in number, iron removal facilities exist, but are not optimized. At least, an effort to make them operational is necessary.

Water quality is also considered to be *good* or *fair* in most rivers (80 per cent). The level of nutrients in the big lakes around Riga, in previous decades subject to serious eutrophication, is believed to have fallen off since the 80s. This assumption would have to be validated through a comprehensive lake monitoring programme, which does not exist up to now. Nevertheless, some big towns are still supplied with surface water from big rivers. This is the case of Daugavpils, Ventspils and Olaine, which will switch to groundwater supply. Riga still relies mostly on surface waters. Therefore, the amount of polluting water discharged into rivers should be reduced and safety measures, such as early warning schemes, should be put in place.

Another concern is the marine water quality in the Gulf of Riga. Despite the 90 per cent reduction in mineral fertilizer application since the early 90s, the trend analysis (1987-1995) of nitrogen and phosphorus loads does not show a general decrease in nutrients brought by the seven biggest rivers.

Figure 7.6: Investments in water sector by sources, 1995-1998



Source: Environmental Investment Programmes in Latvia, MEPRD, 1998.

Table 7.6: Water (responsibilities) in Latvia

MEPRD Carries out national policies for water protection and rational water use	**Ministry of Agriculture** Implements State policy for agriculture, forestry and fishery	**Ministry of Welfare** Responsible for public health and occupational health and safety issues	**Ministry of the Economy** Responsible for energy issues	**Ministry of Transport** Carries out activities connected with the transport of hazardous goods by rail, road and sea
State Environmental Inspectorate: Supervises environmental State inspectors of REPB; controls and supervises the implementation of environmental legal acts	*Regional Agricultural Department (26):* Evaluates plans for agricultural land reform	*National Environmental Health Centre:* Controls drinking quality	*Energy Supply Board:* Providing of energy supply (HES)	***Marine Administration**:* Issues permits for transport by sea and controls pollution of the sea.
Regional Environmental Protection Boards (8): Control and supervise use of water, issue water use permits	*State Plans Protection Inspection:* Controls pesticide use	*State Sanitary Inspection:* Determines use of waste-water sludges		*Port Administration:* Controls pollution of port territory
State Environmental Impact Assessment Board: Evaluates the level of environmental hazard posed (not only pollution but also e.g. physical damage to nature) by an economic activity and the environmental conditions at a particular site, and makes proposals for improving environmental quality	*State Board of Land Improvement Systems:* Controls land improvement systems.			--- ***Ministry of the Interior**:* Responsibilities are fire safety, rescue work and civil defence.
Marine Environmental Protection Board: Controls inland water, territorial sea waters, continental shelf, Latvia's economic zone and port authorities				*Civil Defence Centre:* Responsible for emergency planning, information to the population in case of accident, etc.
Geological Service: Management of groundwater (subsoil).				
Hydrometeorological Agency: Monitors environmental quality				
Environmental Consulting and Monitoring Centre: Establishes environmental monitoring and compiles and disseminates environmental information				
Environmental Data Centre: Data collection and processing, methodological oversight of laboratories				

The responsibility is not to be put entirely on Latvia; most of its rivers originate in neighbouring countries and bring with them a noticeable pollution load. As mentioned in Chapter 5, Latvia strives to establish bilateral and multilateral agreements with bordering countries to tackle this problem. Nevertheless, eutrophication of the Gulf of Riga is still a threat and would have serious repercussions.

Latvia is aware of its responsibilities for taking concrete action to cut the pollution of surface water and is striving to reduce its pollution load. Under HELCOM, the Baltic Sea Joint Comprehensive Environmental Action Programme encourages countries to focus on and combat especially point pollution. The measures aim at discharges from industrial plants and waste-water treatment units, encouraging first a precise description of the pollution generated. It seems that in Latvia, in spite of the obligations laid down in the permits, the monitoring of pollution by polluters is still weak. A particular effort should be made in this respect.

Recommendation 7.1:
The regulation included in the water permit that requires effluent monitoring by polluters should be enforced more strictly.

The NEPP insists on the importance of protecting water quality. The bulk of the environmental expenditures is devoted to improving the functioning of municipal waste-water treatment units, to upgrading them or to building new ones. This is clearly a goal that should be further encouraged. Due to the limited funds available, the country should carefully select the sites where the cost-effectiveness of investment is optimal. Improved emission monitoring, as advised above, would be particularly helpful to steer these choices.

Recommendation 7.2:
The allocation of available funds to the upgrading of existing and the construction of new waste-water treatment facilities which clearly improve treatment efficiency should be maintained and pursued as a top priority. Balancing the need for substantial funds for these purposes on the one hand and their scarcity on the other will make it necessary to rely on a phased approach to the full implementation of relevant EU legislation in all cases.

Considering the important effort and resources spent on upgrading and renovating the water infrastructure in this period of economic recovery and tight budgets, it would be good to know the exact cost of supplying drinking water to the population and of collecting and treating waste water. It would be a good guide for a national water tariff policy. Such a policy could help finance required investments into water supply installations.

Recommendation 7.3:
To assess the full costs of water abstraction and supply, waste-water collection and discharge, it is important to formulate a national water tariff policy.

It would be useful to select, in particular in a longer-term perspective, the water management practices that best fit the Latvian context. Increased research funds should be allocated to the evaluation of water management practices as well as the formulation of alternative options. At the moment, the organizational units that decide on the strategies and plans are not the same as those that decide on investments regarding water management infrastructure. It would be preferable to integrate the decisions by the different units of the MEPRD that are involved in the procedure and strive to ensure that investment programmes are decided fully in line with strategies and plans. In addition, local decision-making would certainly be more efficient if the local players were more involved. A decentralized decision-making structure by catchment area would be advisable.

Recommendation 7.4:
The Ministry of Environmental Protection and Regional Development should play an active role in the decision regarding water investment programmes. The creation of a regional level of management administration - water catchment basins and agencies - to improve water management at the regional level should be seriously considered.

Another problem worth mentioning is the lack of co-operation between administrative structures and institutions responsible for or involved in water management (see Figure 3.1). Existing legal acts do not clearly attribute responsibilities and duties to the different State institutions. There is no co-operation between State institutions and the local authorities, the State institutions having in general the monopoly in decision-making. Moreover, often monitoring is redundant in some places or insufficient in others, data collection and processing are weak, and access to data is difficult. All these drawbacks can be overcome through better coordination between the various partners.

Recommendation 7.5:
An interministerial working committee for water management should be created to better coordinate actions and balance different interests in water management. The Ministry of Environmental Protection and Regional Development and Ministries of Health, of Agriculture, of Transport, of the Economy and of the Interior should be involved.

Chapter 8

NATURE AND FOREST MANAGEMENT

8.1 Current state of nature

Ecosystems and landscape

Latvia consists mostly of lowlands. Highlands represent only 26 per cent of the territory. It has very diverse ecosystems and biotopes. Soils and hydrological conditions differ. Large areas of agricultural lands are abandoned, and natural biotopes, especially wetlands, survive. Furthermore, the low management intensity on agricultural and forest land is favourable for big populations of species that are endangered throughout Europe and for biotopes almost extinct in western Europe and Scandinavia. About 2 million hectares of land that was abandoned during the past 45 years is now overgrown with scrubs and deciduous trees of different successions, providing a mosaic landscape without much human impact.

Latvia's coastline is more than 550 km long. Forest landscapes, mainly conifers, dominate it. 300 km are almost untouched. There remain many sites with natural dune plant communities that are extinct elsewhere along the Baltic Sea. Partly transformed territories - residential areas and agricultural land - occupy 27-28 per cent of the coastline. A 300-metre-wide strictly protected belt along the shore of the Baltic Sea and the Gulf of Riga has been created to conserve coastal landscapes; restrictions may apply to another 5 to 10 km. A ban on forest cutting and on the transformation of forest areas, and other restrictions are in force in the protected belt to preserve biological diversity in coastal areas.

The Baltic Sea basin is young in geological time scales. The land surface was formed during the Quaternary glacial period and the littoral areas were formed more recently by several stages of the Baltic Sea development, with moraine, sand, clay and dolomite sediments. The dominating soils are podzolic. Accordingly, the seashores are not yet fully stabilized. Apart from natural processes, human activities like hydropower plants and other constructions, tourism and dumping of sediments from the canals into the sea contribute to coastal degradation. 120-150 km of the Latvian coastline is subject to erosion. An unfavourable situation has developed in some of the eleven residential areas in endangered coastal zones.

Biodiversity

Latvia's rich biological diversity is mainly due to the diverse nature conditions and the vast number of territories with little human impact (extensive land use, low management intensity on agricultural and forest land). There are 1 680 vascular plant, 49 fern, 497 moss, 492 lichen, 2 680 algae and 4 000 mushroom species in Latvia (Table 8.1). About 18 000 animal species are officially recorded. But, according to scientific assessments, there could be some 23 000 animal species altogether, including 18 000 insect species. The number of bird species is 320. Latvia's 1 000 breeding pairs of black stork *Ciconia nigra* constitutes 10 per cent of the world's population of this species. There are also vital populations of corncrake *Crex crex*, lesser spotted eagle *Aquila pomarina*, white-backed woodpecker *Dendrocopos leucotus*, and crane *Grus grus*. Among the mammals, beaver *Castor fiber*, otter *Lutra lutra*, wolf *Canis lupus*, and lynx *Lynx lynx* are also well represented. Latvia has a comparatively large wolf population. The wild boar, its most hunted animal, has recently reached a population peak. This creates a big problem for agriculture, as the animals destroy potato fields in particular. There are also big colonies and very important hibernating sites for several bat species.

Protecting the sites sheltering these species is crucial for their conservation. The Gulf of Riga and the Irbe Strait are internationally important waterfowl wintering sites; in the autumn - winter period they are home to over 2 million birds. 24 per cent of the north and west European population of red-throated diver *Gavia stellata*, 23 per cent of long-tailed duck *Clangula hyemalis* (more than 1 million individuals), 36 per cent of velvet scoter *Melanitta fusca*, 15 per cent of black guillemot *Cepphus grylle* are found there. The Gulf of Riga's population of eelpout *Zoarces viviparus* is the biggest in the eastern Baltic. Latvia (basin of the

river Salaca) is the only natural spawning site in the eastern Baltic for salmon *Salmo salar* species.

Table 8.1: Number of wild species and their status in Latvia

	Number of described species	Number of species in the Latvian RDB*	% of RDB* species
PLANTS			
Vascular plants	1 678	320	19.1
Ferns	49	23	46.9
Mosses	497	203	40.8
Lichens	492	34	6.9
Algae	2 680	..	..
Fungi	4 000	38	1.0
ANIMALS			
VERTEBRATES			
Mammals	69	19	27.5
Birds	320	79	24.7
Reptiles	7	4	57.1
Amphibians	13	5	38.5
Fishes	95	15	15.8
Lampreys	3	..	..
INVERTEBRATES			
Molluscs	178	29	16.3
Insects	15 000	131	0.9
Arachnida	>1 000	4	..

Source: National Report on Biological Diversity, Latvia, Riga 1998.

* **RDB**: Red Data Book of Latvia.

Nevertheless, as in other countries, some species are threatened. *Isoetes spp*. and *Lobelia dortmanna* have disappeared, except for small populations in some lakes. Over-exploitation of plaice *Pleuronectes platessa* has cut their number. Resources of cod *Gadus morhua*, salmon, zander *Lucioperca lucioperca* and European whitefish *Coregonus lavaretus* continue to decrease. Ides *Leuciscus idus* is extremely threatened. The European mink *Mustela lutreola* and the flying squirrel *Pteromys volans* are probably extinct now.

A number of foreign animal species were introduced: racoon dog, *Nyctereutes procyonoides* and American mink, *Mustela vison*, bee (American and European breeds) and plant, *Heracleum sosnowskyi*. Their introduction has caused remarkable losses in populations of native species.

Forest

Forests are one of Latvia's most important natural resources and are economically vital. Timber is the main export product. Forests have not yet attained their optimal (age and diameter) structure. Young stands represent 5 per cent of forest area. Mean age stands (50.5 per cent) and grown-up and overgrown stands (23.4 per cent) are over-represented, whereas mature stands (21.1 per cent) are under-represented. The economic situation and incomplete legislation have caused forest resources to be over-exploited and their biodiversity to decline.

More than 40 per cent of Latvia's territory is covered with forests (see Figure 8.1). Scots pine covers 40 per cent, birch 28 per cent, Norway spruce 21 per cent, grey alder 5 per cent, aspen 3 per cent, common alder 2 per cent, and hardwoods (oak, ash, etc.) approximately 1 per cent of all forests. Great diversity of forest types and mosaic distribution are characteristic. In total, there are 23 forest growing types identified on Latvia's territory, each with its typical species, habitats, soil and water conditions. Relatively large areas are occupied by mixed and deciduous stands. The total forest area continues to increase. Forest cover has approximately doubled since the beginning of this century. In 1923 it occupied only 25 per cent of the entire territory. The total forest area increased from 1.78 million ha in 1923 to 2.88 million ha in 1995 (Table 8.2).

Since 1990, crown defoliation, discoloration and other damage have been recorded regularly. In 1994, 9 154 trees were sampled. 26 per cent of the broad-leaved trees and 74 per cent of the conifers, mostly Scots pine and Norway spruce, were defoliated. Defoliation is caused by two factors; changes in soil humidity regime and local pest damage. The higher defoliation rate compared to the countries situated to the west and north could be explained by the geographical position of Latvia in the path of prevailing south-westerly winds that bring pollution from highly industrialized countries of central and western Europe. In 1994, almost 2 400 ha of forest stands perished, approximately one third due to pest damage. Exponential growth of beaver populations is another big problem, causing flooding of large forest areas and complicating their management. Moreover, experts in reforestation note a lack of afforestation (see Section 8.2).

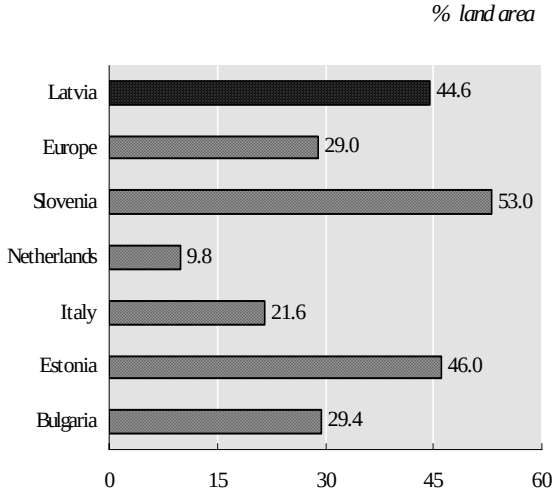
Table 8.2: Forest resources, 1983-1997

	1983	1988	1992	1993	1994	1995	1996	1997
Forest area *(1 000 ha)* **a/**	2 782.0	2 757.0	..	..	2 820.0	2 870.0	2 882.0	2 884.0
By ownership *as % of total area:*								
State forests	..	63.3	..	..	56.9	..	56.4	51.8
Private forests	..	-	..	..	15.5	..	22.6	44.2
Forests of agricutural enterprises	..	33.2	..	..	7.6	..	1.6	2.8
Other forests	..	3.5	..	..	20.0	..	19.4	1.2
Protected forest area *(1 000 ha)*	..	834.3	..	..	..	..	..	854.0
Growing stock *(Million m^3)* **a/**	384.0	432.0	..	489.0	..	..	489.0	502.0
Fellings *(1 000 m^3)*	..	4 805.8 b/	4 014.6	4 757.2	5 730.0	6 885.7	6 763.6	8 923.3
Forest regeneration *(ha)*	..	..	..	5 805.0	5 253.0	5 855.0	5 800.0	6 800.0
Area covered with forests *(%)*	43.1	42.7	..	..	43.7	44.4	44.6	44.7

Source: State Forestry Service.

a/ Data refer to 1 January of each year.
b/ Data refer to 1989.

Figure 8.1: Forest area in Latvia and other European countries, 1996.



Sources: Forest and Forest Industries Country Fact Sheets, Geneva Timber and Forest Study Papers, UN-ECE and FAO, United Nations, New York and Geneva, 1997.

Since 1994, the Ministry of Environmental Protection and Regional Development, in cooperation with the Latvian Institute for Forest Studies, has been working on a project to assess forest diversity and evaluate the territorial volume of protected forests in order to coordinate economic activity with biodiversity protection in the future. A total of about 248 000 ha or 8.8 per cent of total forest area is protected according to a protection regime which is far from representative. In general, intensification of forestry seems to be faster than the cataloguing of natural assets and the legislation process. The resulting threats to rare nesting birds (especially the black stork *Ciconia nigra*), to wet forests and to old forest stands are obvious.

Species protection and protected areas

Latvia has two national parks (Gauja and Kemeri). Protected areas cover about 6.8 per cent of the territory (Table 8.3 and Annex I). The Law on Specially Protected Nature Areas of 1993 defines several categories of protected areas, which have recently been translated into IUCN categories (Table 8.3). Protected areas may be State-owned or privately owned. If the area is privately owned, the Law sets out restrictions and obligations for landowners and users, which are not sufficiently counterbalanced by compensation measures. (See possible exemption of land tax in Chapter 3, section 3.1).

Forests are widely represented in protected areas of different types. A network of strictly protected forest reserves has been established. They represent 1.1 per cent of the total forest area. Some of them are located in the core zones under strict conservation regime in the State nature reserves and national parks. The others are part of botanical reserves or of sanctuaries for rare birds or other animals.

A protection regime for habitat conservation is in force in 93 bogs, or 12 per cent of the total area covered by bogs. Lakes are relatively well represented within other protected territories. In particular mention should be made of shallow

Table 8.3: Protected areas in Latvia, 1998

Category of protected territories	IUCN Category	Number	Total area *(ha)*
State Nature Reserves	I	5	39 261
National Parks	II	2	134 840
Complex Nature Reserves	IV or V	40	41 646
Botanical Reserves	IV	46	4,367
Bog Reserves	IV	28	26 889
Cranberry Reserves	IV	51	21 611
Zoological Reserves	IV	15	15 870
Nature Parks	II	11	25 602
Protected Landscape Areas	V	5	100 018
Biosphere Reserves a/	IX	1	400 000

Source: National Report on Biological Diversity: Latvia, Ministry of Environmental Protection and Regional Development, United Nations Development Programme. Riga, 1998.

a/ 5.2 % of their surface are included in categories mentioned above.

overgrowing lakes, which are extremely significant for breeding waterfowl and other bird species that live near water. The total protected area on six such lakes is 10 490 hectares. Four other lakes and islands in 13 lakes are botanical reserves.

Although they have been well preserved thanks to the low management intensity of agricultural and forest lands, the wetlands are among the most endangered ecosystems in Latvia. The main threat is the extraction of peat for heating purposes – a threat that affects in particular one of Latvia's most valuable wetland systems. In general, Latvian wetlands, with their considerable biodiversity, are of international importance for conserving standard endangered biotopes of the Baltic region and Europe. They are of particular importance also as mass concentration sites for migrating birds.

Meadows (12 per cent of the territory) are presently the most endangered and generally least protected ecosystem in Latvia. Four meadows located in coastal areas are designated as ornithological or botanical reserves: they cover a total area of 990 ha.

8.2 Pressures on nature

Mineral resources and their use

Limestone, gypsum, clay and sand as building materials, peat as fuel, and sapropel (organic sediment on the bottom of lakes) as fertilizer, are Latvia's main mineral resources. With the decline of the national economy, the extraction of natural resources has also decreased. (See Table 3.2 for data).

Latvia's natural conditions, mainly climatic and hydrogeological, support the process of peat and sapropel generation. 4.2 per cent of the country is covered by high peatbogs. Peat resources are well determined (Table 3.2) because wetlands are extensively studied. Peat extraction takes place on 9 per cent of high bog area; the rest is relatively untouched by human activity and well protected. In 1994 the volume of extracted peat was 753 000 tonnes, of which 17 per cent was exported to western Europe, mainly Germany. In 1996, the volume extracted shrank to 596 000 t and fell further in 1997 and 1998.

In the near future, oil, geological structures for underground gas storage, geothermal energy and mineral waters will be used as resources. On the Baltic Sea shelf within Latvia's economic zone, prospective oil-bearing structures have been detected with an estimated amount of about 125 million tonnes. Small oil deposits might also exist in southwestern Latvia. Several geological structures in Latvia are suitable for underground gas storage with a possible storage volume estimated at 52.5 billion m^3. An important underground gas storage site already exists in Inchulkalns, near Riga, with a working capacity of

2.2 billion m^3. Latvia is also very rich in mineral water. Several types of mineral water are bottled and exported. Several groundwater layers contain geothermal waters. The temperature in Cambrian sediments reaches 60.5°C.

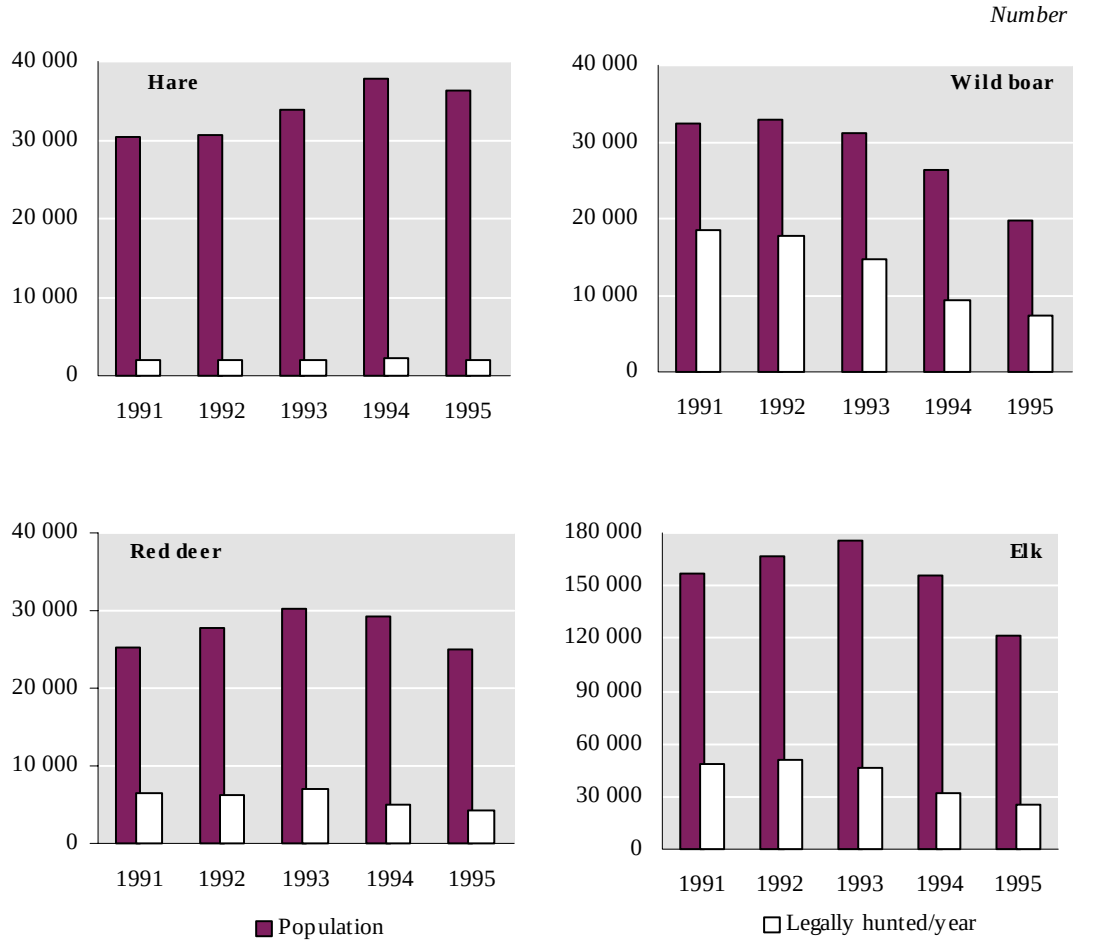
As a result of the national economy's restructuring, several large mining companies were liquidated. Many pits and extraction sites were returned to their former owners and are now their property or under their management. Some pits are now operated by several companies. Due to these changes, problems have occurred in operation. In 1993, inspection of 1913 extraction sites and pits revealed that their management was often inefficient, operators violated legislation and were not aware of extraction limits or did not record actual extraction volumes. Generally, only 25 per cent of resource extraction sites are managed in accordance with economic and environmental requirements. The problem of site recultivation is still unsolved (see also Chapter 3).

Wildlife use

The Gulf of Riga is the richest fishing ground in the Baltic Sea, with a productivity of 12 kg of fish/ha. Baltic herring, sprat, followed by jack mackerel, cod, flatfish and salmon form the largest part of the catch. The coastal waters are the main fishing grounds for salmonids, pikeperch, vimba, flatfish and eelpout. Fishing rights for Baltic herring, sprat, cod and salmon resources in the Baltic Sea are determined by the International Baltic Sea Fishery Commission (IBSFC), which allocates annual fishing quotas to each country. So far, the catch level seems sustainable. In 1994, the total permissible catch (quota) was 130 000 tonnes in Latvian waters. The same year, the official catch was 46 000 tonnes or 35 per cent of the quota; in 1996, 72 000 tonnes were caught and in 1997 about 100 per cent of the quota.

Fishing for other kinds of fish in Latvian waters is determined by national fishing regulations,

Figure 8.2: Population of selected hunted species and number legally killed per year



Source: Central Statistical Bureau of Latvia. Riga, 1996.

including limitations on catch volumes or fishing devices. Coastal species (turbot, flounder, eelpout) are fished intensively (5 per cent of the total catch in the Baltic Sea and increasing). Measures are needed, because scientific investigations have shown signs of over-exploitation of a number of fish (plaice: size of the catch and number of young fish are decreasing, as are resources of cod, salmon, zander, European whitefish and especially ides). Moreover, the Fishery Board estimates that half the catch in the coastal and inland waters by individuals is illegal.

Compared to the sea catch, the catch in internal waters is quite low. About 800 bodies of water larger than 10 ha are potentially important for fish farming. Fishing with commercial fishing equipment is practised in 164 lakes and in larger rivers. The catch in internal waters has decreased in recent years due to economic restructuring. Internal water fish resources could sustain a fivefold catch increase without upsetting the ecological balance in these bodies of water.

Hunting bags of hare, wild boar, red deer, elk and other game are recorded annually (Figure 8.2). Hunting pressure on game populations has increased due to illegal hunting because of the bad economic situation. The number of moose *Alces alces* has declined sharply. This can be explained by the increase in hunting licences in recent years because moose were causing much forest damage. Hunting pressure on the capercaillie *Tetrao urogallus* probably exceeds the allowable level, since commercial hunting has started to be organized for foreigners.

Forest exploitation and agriculture

Relatively large forest areas are being privatized under the land reform (642 000 ha, i.e. 22.3 per cent of all forests in 1995). The land privatization, together with economic hardship, has resulted in a more intensive use of forest resources since the early 1990s, with many people felling timber for sale. Consequently, several species (Black Stork *Ciconia nigra*, capercaillie *Tetrao urogallus*) have seen their numbers dwindle as their habitats are destroyed by felling, noise caused by machinery or other disturbances caused by the use of forests. For instance, in Latvia's forests, 300 edible mushroom species and berries are picked. The most important are chanterelles (which are exported), blueberries *Vaccinium myrtillus*, cranberries *Vaccinium oxycoccos*, cowberries *Vaccinium vitis-idaea*, and raspberries *Rubus idaeus* (*Rubus arcticus* and *Rubus plicatus* are extinct). In 1994, an investigation into the nesting sites of the threatened species revealed that the numbers of several species (black stork *Ciconia nigra*, capercaillie *Tetrao urogallus*) had already started to decline: over the past few years, the number of pairs of black stork has decreased by about 15 per cent. This decline is caused both by disturbances during the breeding season and by the destruction of nesting sites through forest cutting. The problem is aggravated by the increasing numbers of insufficiently trained staff involved in forest work. However, it should be pointed out that forestry in still mostly based on handwork, and there is no heavy machinery impact.

Forest fires (see Table 8.4) are also damaging forests and their ecosystems (e.g. breeding places of *Tetrao urogallus)*.

Together with forestry, agriculture is of vital economic importance in Latvia. About 39 per cent of the territory is agricultural land, of which 1.7 million ha is arable. The main impact of intensive agriculture has been pollution due to the intensive use of fertilizers and pesticides along with the production of large amounts of manure from cattle farms. Nutrients used in agriculture have caused significant groundwater pollution in some areas. Although the application of mineral fertilizers has decreased by 95 per cent since 1990 (see Table 10.2), in the areas of intensive agriculture nutrient run-off is still high. The use of herbicides and other pesticides on agricultural land (see Chapter 10) together with other practices has dramatically reduced the number of kestrel *Falco tinninculus*, partridge *Perdix perdix*, roller *Coracias garrulus*, hen harrier *Circus cyaneus*. The populations of corncrake *Crex crex* and European

Table 8.4: Forest fires and fire sites, 1990-1997

	1990	1991	1992	1993	1994	1995	1996	1997
Forest fires *(Number)*	626.0	225.0	1 510.0	965.0	854.0	582.0	1 095.0	768.0
Damaged surface area *(ha)*	263.0	69.3	8 411.8	570.6	350.0	535.6	927.0	448.6

Sources: Central Statistical Bureau of Latvia,
State Forestry Service.

hare *Lepus europaeus* have also decreased considerably in the intensively managed areas.

Unfavourable changes in the management of some coastal meadows and protected areas occurred in the late 1980s and early 1990s. This wiped out various plant and bird species. The cessation of grass mowing and grazing, the lack of management plans and action, caused mainly by the economic situation, were particularly to blame. For instance, a type of dunlin *Calidris alpina schinzii*, which was a regular breeder, vanished in the early 1990s, and ruff *Philomachus pugnax* has disappeared from coastal meadows.

Tourism

Along the Latvian coast, tourism has not been much developed, due partly to the military restrictions during the Soviet period. At the time, tourism concentrated on some towns around Riga. Most tourists to Latvia came from the Soviet Union. After privatization, the tourism sector grew but it does not seem to contribute much to socio-economic development or cultural exchange. In spite of continuing restrictions in the protected coastal belts of northern Latvia, the sand dunes are being destroyed by visiting hikers and motorists. The development of commercial hunting, for capercaillie in particular, as a tourist activity, is also a threat to nature.

8.3 Nature conservation policy and management

Policies and objectives

Latvia's overall ambition is to maintain its current level of biodiversity and landscape characteristics. Protecting biodiversity is among the issues covered by the EU approximation process. Both the NEPP (1995) and the National Biodiversity Action Plan (NBAP) recognize that preventing a further decrease in biological diversity is a priority.

Improving environmental quality and ecosystem stability is a priority in areas where human activities are concentrated and environmental pollution may threaten human health. Other priorities are to prevent environmental quality from deteriorating elsewhere, mainly by easing pollution pressure, and to use natural resources in a sustainable way. None of these goals can be reached without integrating environmental policies in all branches and fields of life, and Latvia's policy aims to achieve that.

To reach these goals, the NBAP advocates the rational use of the limited regular budget and recourse to foreign assistance. It also calls for better consultations with local communities and landowners, and institutions managing biological resources. Success also depends very much on the ability to raise public awareness. The MEPRD is currently further elaborating the National Biodiversity Strategy and Action Plan.

Legal provisions

In accordance with the 1994 Regulations on Physical Planning (reviewed in 1998), planning at all administrative levels has to take into account the protection of territories and their rules. The Regulations provide for a balanced assessment of the territory's current uses, the natural, cultural and historical assets requiring special protection. Other laws are geographically more specific, such as the 1997 Law on Shelter/Protected Belts, according to which protective zones were established along, for instance, the shores of the Baltic Sea and Riga Bay as well as watersheds and watercourses. The main goals are to reduce the effects of pollution, protect forests, seaside scenery and natural resources, and prevent soil erosion. In addition, according to the 1990 Law on State Ecological Expertise, and its updates, assessments of new projects have to take nature protection legislation into account.

Very important for the conservation of biological diversity in Latvia is the Law on Specially Protected Nature Areas adopted in 1993. It establishes procedures for organizing protected areas, their administration and management, and defines the responsibilities of State institutions and landowners. At present, the legislation does not include all the details required for the development of the concept of ecological corridors in Latvia nor for the protection of water ecosystems and migrating species. Furthermore, this Law does not include provisions for compensating owners for the restrictions resulting from the protection regime. Therefore, in general, the system of agreements between the landowners and municipalities on the management of protected areas and the protection of important sites for threatened species should be improved.

Parliament has recently adopted a new regulation on particularly protected nature areas and objects to complement Resolution 107 of 1987. The new regulation includes an updated list of protected areas and species and new rules for their management. Enforcement at the regional or local

level is the task of the Regional Boards. Previously, the responsibilities for nature management were not so close to the local level, but that will change with the upcoming administrative reform. The 1987 Resolution was closely connected to the Red Data Book (1985), in which the species are classified into 5 categories that coincide with the IUCN's. The Resolution set rules to protect animal species according to the category in which they are classified. The list of particularly protected species and regulations for their protection was updated regularly according to changes in their status. However, up to now the legislation could not fully ensure the maintenance and protection of the local breeds of animals, varieties of crops and cultures of micro-organisms. Overall, the Resolution's implementation was unsatisfactory.

Other draft laws are being worked out to complete and update the existing battery of laws on nature protection: one on the protection and maintenance of landscapes and another on the protection of species and biotopes. The latter is urgent, as it is necessary to set out the general principles of protection of species and habitats and mechanisms to fulfil the requirements of international conventions (Ramsar, Bern, Washington, Bonn and Rio). Regulations for the conservation of threatened species, the use of commercial species and measures to protect the habitats of wild species outside protected areas will be included.

Hunting is regulated by the Law on the Use and Protection of Animals (1981), the Law on Hunting and the Hunting Regulations (1995), which cover animals subject to hunting, imports of game, hunting seasons, limitations on hunting, hunting weapons and tools, and hunting permits. The State Forest Service issues permits and supervises all hunting grounds. The control of illegal hunting and landowners hunting on their territory is under the responsibility of the Forestry and Hunting Inspectorate of the Ministry of Agriculture.

Fish resources and their use are subject to the Law on Fishing of 1995. Other legal acts from the Cabinet of Ministers regulate the fish and invertebrate species subject to fishing, legal fishing tools, seasons and territories. The national Board of Fisheries of the Ministry of Agriculture manages fish resources. The Environmental State Inspectorate and the regional environmental boards carry out control duties.

A Fish Fund has been established (Regulations on the Statute of the Fish Fund, 1995). Compensations for damage, permit fees and fines are paid into the Fund. The purpose is to generate additional finance for scientific research (investigation into fish resources and influence of pollution) and measures relating to fish reproduction and protection. The fishing legislation is very detailed and sometimes contradicts other laws (for instance, there is no agreement on the amount that the fishermen should pay for fish, as one of the country's natural extractable resources, the value of which should be calculated by ecological cost-benefit analysis).

One of the priority goals of the Environmental Policy Plan is the sustainable use of natural resources, with forests being the most valuable. A forest management development programme and a national forestry policy are under preparation. The main goals of the policy are: (i) introducing a balanced and sustainable forest management system, (ii) ensuring the preservation of the existing forests, (iii) introducing limitations on the transformation of forest land, and (iv) ensuring the transformation of areas of no agricultural value into forest land and supporting this conversion process by subsidizing it.

The 1994 Law on Forest Management and Use aims at ensuring forest protection, regulating the management and use of forests, and protecting the rights of forest managers and users. It advocates a sustainable use of the forest, a principle which guarantees that biodiversity is protected, exploitation sustainable and forest recovery ensured. Forests are divided in 3 management categories. Management plans are set up for every forest district. Specially protected forest plots allow for the protection of listed animals and plant species and habitats. There are other laws that regulate the use of State forests, afforestation, felling and environmental impact assessment to evaluate all forest management plans. Currently about 60 per cent of forests are State-owned. Most private owners do not have the expertise or the equipment to appropriately manage their plots.

The Law on Subsoil (May 1996) was the first legal act related to subsoil management prepared by the State Geological Survey since Latvia regained independence. The Law emphasizes the sustainable use of natural subsoil resources. It also aims at protecting the subsoil, for instance by establishing protected areas and reducing subsoil

use. On this point, it overlaps with the Law on Environmental Protection, for which the rational use of natural resources is also a fundamental principle. It overlaps with the Law on Water and the Water Use Permit Regulations as regards groundwater, too. It is also closely related to physical planning and ecological expertise legislation, but not sufficiently to the legislation on specially protected nature Areas in order to ensure the continuity of the ecosystems and habitats.

Institutional framework

The Forestry Department of the Ministry of Agriculture is responsible for policy-making and legislation. The State Forest Service, which consists of Senior Forestry Agencies as well as of local agencies, is an independent State institution. Its main responsibilities are controlling all forest use, managing State forests, implementing and enforcing legislation related to forestry, including issuing general instructions, guarding and protecting forests and organizing the preservation of the forests' genetic resources, providing for the renewal and cultivation of forests, issuing permits and approving forest management plans. Both the Forestry Department and the State Forest Service are interested financially in the felling of trees, because 70 per cent of stump fees are transferred from the fund to the Service; the other 30 per cent are transferred to the local municipality. Currently financial resources for the maintenance and protection of protected forests are lacking. This explains why the municipalities are not willing to create new protected territories.

To ensure and regulate the rational use and protection of the subsoil, the State Geological Survey was established in 1995 under the Ministry of Environmental Protection and Regional Development. Its main task is to ensure and regulate the rational use and protection of the subsoil. The MEPRD and the Regional State Environmental Inspection control the subsoil exploitation activities. If there is a threat to human health or the environment, the State and local authorities have the right to limit or discontinue the activities at the origin of the threat.

The MEPRD is responsible for developing State tourism policy. The State Tourism Authority, subordinated to MEPRD, is responsible for working out a tourism development strategy and implementing State tourism policy. The Latvian Consultative Tourism Council, including representatives from branch ministries, key industry players, public organizations involved in travel services, is responsible for working out recommendations on tourism to State institutions, businesses and NGOs. About 20 new tourist information centres have been established during the last three years, owned by both municipalities and the private sector.

Information on nature

55 monitoring programmes are implemented on various nature issues, covering different habitats (forests, meadows, agricultural land, protected sites, etc.), plant and animal species (mosses, trees, reptiles, birds, mammals, etc.), and measuring environmental pressure (air pollution, pests). Performed by more than 10 different institutions, these subprogrammes have not yet been scrutinized under the complex monitoring programme currently developed by the Environmental Consultancy and Monitoring Centre (see Chapter 4), and are thus not yet coordinated. Although these sub-programmes are numerous, some gaps remain and some specific fields are not monitored.

Regarding nature protection, NGOs are traditionally important actors. In Latvia NGOs such as the Latvian Fund for Nature, the Latvian Ornithological Society, the WWF programme for Latvia, the Children's Environmental School, the Coalition Clean Baltic (Latvia), the Environmental Protection Club and the Ecological Centre (University of Riga) strive to develop education and raise public awareness about biodiversity. They are trying to improve the information on nature protection in education. But their role in education and the organization and management of protected areas is not particularly prominent (except for the Latvian Fund for Nature).

8.4 Conclusions and recommendations

Latvia is a country with a rich and diverse natural environment, which has been comparatively well preserved. Its biodiversity is unique in Europe. Thanks to its less intense agriculture and forestry, and the fact that, for decades, large stretches of the coast were off-limits for reasons of military security, Latvia has a wealth of habitats and species that has been lost in many, if not most, other areas of Europe during this century. However, rapid land reform, the intensification of agriculture and forestry over some areas, the modernization of transport systems, the use of coastal zones and other scenic areas for recreation and in particular for development, are likely to endanger the

diversity of species and ecosystems, hinder the migration of many species and lead to the degradation of the natural and cultural landscapes of Latvia, unless countermeasures are taken.

Aware of the many and rapid changes which have recently occurred and had an impact on nature, the MEPRD is setting up a complex monitoring programme to harmonize measures and methodologies, and to optimize monitoring coverage and cooperation between the various monitoring institutions (see Chapter 4). Monitoring of nature issues is one of the subprogrammes that will be rationalized. It is hoped that present gaps in the monitoring of biodiversity will then be bridged.

Recommendation 8.1:
An overall monitoring programme for biodiversity should be developed with a particular view to bridging the current gaps.

The MEPRD has been involved in the development of the nature conservation strategy, since 1993. However, apart from the MEPRD, nature conservation concerns each and every level of State administration, every branch of the national economy and every organization which directly or indirectly influences nature. Measures have to be coordinated with NGOs and all organizations that deal with nature protection. The State administrations should provide information to NGOs about the current environmental situation, pointing out major problems and opportunities for working together. The affected economic sectors should be involved as well, in order to strengthen the implementation of conservation measures foreseen in the laws. Such cooperation with target groups and the raising of public awareness will support the strategy's implementation. Close cooperation between the Baltic States when developing public education and training would ensure improvements in the conservation of biodiversity in the Baltic region.

Recommendation 8.2:
The existing national biodiversity strategy should be brought fully into line with the pan-European Strategy on Biodiversity and Landscape Protection, and incorporate the requirements of the EU directive on species and habitat protection.

Since concrete nature conservation action is ultimately taken at the district or local levels, it is important that the corresponding structures of the MEPRD are capable of dealing with such specific matters. Therefore, their capacity should be improved and their staff specially trained.

Recommendation 8.3:
The regional structures of the Ministry of Environmental Protection and Regional Development should incorporate expertise in biodiversity evaluation, conservation and management.

The extent of forest land makes forests both a major economic resource and an ecosystem of outstanding importance. Timber production has considerably increased over recent years, as only general laws are in place. However, Latvia hopes to develop and gain added value from its timber resources. It intends not only to increase timber exports, but also boost its wood manufacturing as well as the pulp and paper industries. The expansion of the timber sector is also expected to bring jobs to the rural areas, where economic conditions are difficult. As a result, the conservation of habitats of rare species as well as particularly valuable biotopes is under threat. Restrictions on forest use in protected territories and protection belts around waters have been relaxed since the early 1990s. Forest use should be sustainable.

Recommendation 8.4:
In addition to timber production, other purposes of forests should also be safeguarded, including environmental protection and the conservation of species and habitats. The objectives of conservation and sustainable use of forests should be integrated into land-use planning and agricultural sector development.

Relatively large forest areas are being privatized during the land reform. The number of private owners stands at some 30 000. There is no legislation to protect biodiversity in private forests, as only general laws are in place. Bird nesting places are threatened mainly in private forests. Legislation regulating the forestry activities of both public and private owners exists, but is not adapted to the peculiarities of the two forms of ownership, as it is the same for both. To help the 30 000 private owners who own 90 per cent of the plots below 5 ha manage their forests, legislation should be modified: the administration should be reorganized to focus more on private landowners and a forest training centre should be created.

The use of forest resources should be governed by

management plans, and their preparation is in rapid progress. Ideally, forest systems should be managed as ecological units. This would entail coordinating and integrating components of relevant administrative institutions. The ecological functions of forests should be maintained because they are intrinsically linked to the conservation of water and soils, nutrient cycling, and the mitigation of climate change. To sustain those natural forests with very old and dying trees and prevent the establishment of monocultures, small, protected areas should be created and include old forests. The aim is to keep the balance between planted forests and natural forests by suppressing the domination of a sole species over a whole stand. Eco-tourism should be incorporated in particular into forest management and planning. To protect soil and plants and prevent pollution, the management plans should foresee the use of environmentally sound technology in forestry.

Recommendation 8.5:
The legislation regulating, for instance, the activities of private and public forest or land owners should oblige them to protect and keep valuable biodiversity features (for example, old trees). The use of tax instruments for these purposes should be spelled out in the legislation.

Particular care should be taken in silviculture to maintain adequate populations of species that are important in the food chain or that provide ecological functions. Old-growth forests should be maintained, and a system of small, undisturbed forest reserves and small virgin reserves should be created. Proper management and specific new restrictions should be imposed on old stands. The socio-economic aspects of forests should be addressed, such as having the local population benefit from the use of forests, as well as an equitable distribution of incentives, costs and benefits associated with forest management among the main participants. The introduction of alien species that threaten ecosystems, habitats or species should be controlled or stopped. Fortunately, the Douglas fir, which was introduced from North America, has not spread and remains limited to some city parks.

Comprehensive forest management of this type will require extensive training of ministerial and other staff. To support education and training programmes, funds from the State budget should be combined with support from international sources. Priority in funding of education programmes for Latvian specialists and managers should be given to sustainable methods and practices conserving biodiversity in forestry and agriculture. Furthermore, the potential of public participation should be fully used. On the subject of forest regime and nature protection, public participation should mean more than just convening public information sessions, and include appropriate representation on committees, access to information, particularly for NGOs, opportunities to comment on decision-making processes, etc.

Recommendation 8.6:
The Ministry of Agriculture should arrange special training programmes on the basic principles of applied ecology, including those modifying traditional forestry principles. Furthermore, the biological and economic value of biodiversity, and the organizational principles of eco-tourism, should be included in the programme, which should address local administrative bodies and their staff.

An extensive system of protected areas was developed, but due to privatization numerous potential special protected areas were not included in the protected areas list. A new list was expected by August 1993, but its preparation was delayed for approximately 6 years. It is now expected to be completed by the end of the summer of 1998. The management of protected areas does not fully meet today's international criteria. Threats to species and biotopes are often not investigated thoroughly when a protected area is established. Consequently, limits on anthropogenic impact and special management activities to maintain the biological value of the territory are not always adequate.

The most serious problem is that territories have not drawn up all necessary management plans and that there are very limited funds to implement those that do exist. Latvia should therefore put more emphasis on the existing system of protected areas for the conservation of biological diversity. Management plans should be used to facilitate the provision of international support, particularly when relating to nature areas that are important internationally, but that are threatened due to the lack of an appropriate protection and management regime. Implementing nature conservation plans is particularly urgent for coastal zones and the remaining wetlands. The coastal section Dzeni-Ainazi, Kaltene/Engure Area, Lierlirbe/Kolka Area and Pape/Perkone Area, which have been proposed for inclusion in a system of Baltic Sea Protected Areas adopted by HELCOM 15, deserve particular attention.

Recommendation 8.7:
Resources should be allocated to develop management plans and to their implementation.
To comply with Natura 2000, Latvia is drawing up an inventory in connection with the CORINE biotope project. Many weaknesses are already apparent. Many roads cross the specially protected areas and protected belts, thus interrupting the ecosystems' integrity. The sand dunes of the northern part of the coastal protection belt are threatened by tourism. The regulations related to protection belts are very general, and cannot ensure the proper protection of sand dune habitats.

For the time being, foreign tourism in the coastal areas is low because of the lack of promotion and infrastructure. At present, there are no appropriate laws or regulations on tourism. The approximation to the EU, as well as the National Biodiversity Action Plan, which will be completed by the end of 1998, will require the preparation of such a programme. Recognizing that a healthy environment and beautiful landscapes constitute the basis for the long-term development of all tourism activities, this programme should be developed according to sustainable development principles. Potentially large tourist attractions are Jurmala, Sigulda and Gauja National Parks, some parts of the North Vidzeme Biosphere Reserve, Kuldiga, Aluksne and Latgale. In Aluksne, Latvia, Estonia and the Russian Federation are carrying out a joint project for winter sports. The contribution of tourism to gross national product is increasing steadily. When developing and implementing State tourism policy, the environmental impacts and their economic consequences should be analysed - for instance, using cost-benefit analysis where possible, and cost-effectiveness analysis when benefit estimates are not available.

To protect sand dune habitats, the municipalities should prepare territorial plans that indicate properly the places for tourism activities. New, small, specially protected areas should be designated according to the specifically selected locations of threatened species and geomorphological structures. The municipalities should be active in planning the development of tourism on their territory by working out the strategy of development and territorial design while taking into consideration environmental legislation to keep their local natural and cultural values. Small-scale tourism in farmlands may be an attractive option for sustainable eco-tourism. Projects relating to tourism should be prepared after the completion of the National Biodiversity Action Plan, and these projects should be supported by bilateral and multilateral funding organizations.

Recommendation 8.8:
In protected areas, their buffer zones and in coastal zones, environmental impact assessments should become obligatory prior to any investment, regardless of the size or type of the planned activity.

Today the number of specially protected areas is not sufficient. In addition, the designation of specially protected areas does not specifically depend on the existence of threatened species and geomorphological structures. An important problem for many protected areas is the lack of interest or even the negative attitude of municipalities and local people. Support for the establishment of new protected areas and for new conservation measures for species and biotopes has been lacking at all levels during recent years. Other important difficulties stem from the insufficient control and implementation of legislation, lack of compensation for land acquisition, and the landowners' lack of funds. Public information should be used to overcome such resistance, starting in areas of priority concern.

Recommendation 8.9:
Information campaigns should be initiated to highlight Latvia's heritage in terms of (a) the significance of natural assets for biodiversity conservation, e.g. wetlands and coastal areas of international importance, and (b) species populations - even populations of threatened species that are significant at the global or European scale.

Since 1958, ecological studies have been carried out. These have covered population ecology and anthropogenic effects on flora and fauna populations. For instance, pollution is not a problem for birds in general, as extensive agricultural areas have remained completely unused for 5 years. Roughly speaking 50 to 70 per cent of unused areas in Latvia are meadows, pasture and grasslands. However, in some spots where agricultural (or other human) activities are quite intense, the food chain appears to be destroyed in the ecosystem, impoverishing certain species. The most severe case is that of the roller species in all kinds of forest landscapes around clear-cuts. The estimated population in the 1940s was around 15 000, now it is down to 10-100, due to a loss of food, e.g. the disappearance of some big insects.

Although the population of game animals has decreased over the last 5-7 years, probably due to over-exploitation by humans and the harsh winters these past two years, hunting is not a real threat to species conservation today, as control of species is generally satisfactory. For example, hunting of *Tetrao urogallus* is very limited because the obligatory hunting licence for this species is very expensive. If controls were relaxed, a potential threat may arise for capercaillie, because of the possible arrival of foreign hunters. On the other hand, hunting of woodcock is not licensed, and the conservation measures are not efficient, although proper population data are not gathered. In addition, the number of wolves is estimated to be down 50 to 90 per cent, and might deserve some conservation measures. Finally, the biological cycles of economically important fish species which are being over-exploited, such as cod, salmon, zander, European whitefish and ides, will need to be investigated.

The introduction of foreign species can also threaten indigenous species. For instance, the introduced American mink, *Mustela vison*, caused the extinction of the European mink, *Mustela lutreola*. The American mink population is still growing, constituting a problem for waterfowl, because it takes over their habitats (the lakes; European minks live near rivers). A Siberian species of racoon dog, which was partly introduced from Belarus and the Russian Federation as a new predator, harms the birds.

Recommendation 8.10:
The species protection policy should be maintained at its successful level, paying perhaps increasing attention to the risks stemming from the introduction of alien species, especially in the most vulnerable coastal landscapes. Coastal vegetation needs to be monitored efficiently within a regional (Baltic) scientific framework.

Changes in regulations of landownership have caused legislative uncertainties for the protection and use of lakes. New regulations are required urgently. They ought to be based on the available relevant long-term scientific experience. Lake Engure and Kemeri National Park are of particular interest in this connection. The flora of Lake Engure should be monitored regularly in such a way that the succession steps can be determined so as to find the best approaches to using and preserving the lake's biological diversity and resources, which, in turn, stimulates the regional development of this wetland. As one of the elements of the food chain in the lake, the changes in the size of the midge population should be studied carefully. The hydrobiological knowledge revealing the fluctuations of the species under study will help to find appropriate uses for the lake. To continue the ornithological, hydrobiological, chemical, botanical and entomological monitoring without interruption, these activities should be supported by the countries on the migratory routes of the birds that nest around Lake Engure.

Recommendation 8.11:
The regulations needed for the adequate protection of lakes should be urgently adapted to the emerging system of land use, particularly new ownership laws. Appropriately trained permanent staff is required for monitoring and implementing the regulations, as well as coordinating activities between all users of Kemeri National Park and Lake Engure.

Chapter 9

WASTE MANAGEMENT AND INTRODUCTION OF CLEANER TECHNOLOGIES

9.1 Current situation of waste

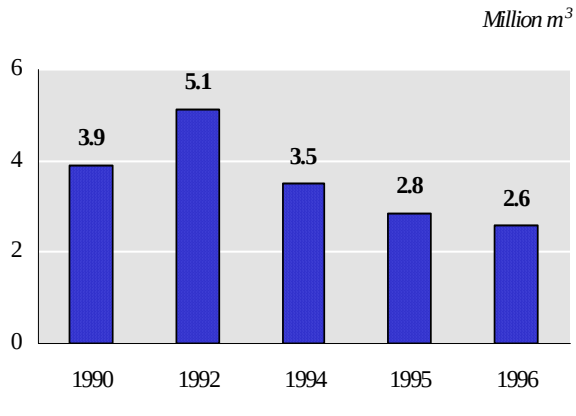
General overview

Waste is a serious concern in Latvia. Of the 10 environmental priorities in the Latvian NEPP, the environmental impact of waste is one.

Describing the quantities and qualities of the waste generated in Latvia is difficult. The first reason is the absence of an official definition of waste in general, and an unclear definition of hazardous waste, which is only partially in line with EU Directive 91/689/EEC. Secondly, there is no regular reporting system for municipal waste or for industrial waste. There is also a lack of data differentiating among types and origins of disposed waste. At present, only hazardous waste generation is subject to reporting, but the data collected are not considered reliable, as reporting by the generator is never checked.

Non-hazardous waste

Figure 9.1: Generation of municipal waste, 1990-1996



Source: MEPRD.

As waste registration takes place only at the landfills of the biggest cities, the available data on waste quantities are based on field surveys (reflecting average production per capita and per area/region). They are provided by the Regional Environmental Boards and the municipalities. Since 1990, the amount of waste generated by households and service companies has declined (Figure 9.1). It was close to 2.6 million m^3 in 1996 (i.e. about 500 000 tonnes). In fact, it is likely that the quantity effectively generated is 20 to 40 per cent higher than Table 9.1 estimates, with only 50 to 60 per cent of household waste being collected. This means that about 600 000 to 700 000 tonnes of municipal waste would be generated annually, 30 per cent of it being commercial waste and waste from institutional producers.

Only very limited information is available about the production of non-municipal solid waste (agricultural, industrial, construction and demolition waste, car scrap, etc.). In the absence of any reporting system and on the basis of the amounts registered by the centralized waste collection services of cities (there is no registration in rural areas), non-toxic industrial waste disposed in municipal landfills totalled some 42 000 tonnes in 1993, a figure which seems very low. In reality, most of the time these types of waste are either stockpiled on industrial premises or brought to dumps by the producers or by specialized haulers, and are not accounted for.

Due to a sharp and continuing reduction in industrial waste and the low level of consumption at present, the total waste amount is not increasing. However, household waste tends to grow, a trend that is largely due to the higher consumption of packaged goods. In addition, be they pessimistic or optimistic, all the forecast scenarios indicate that the production of municipal waste will increase after 2000-2002, as signs of economic recovery are appearing.

The global data given in Table 9.1 hide huge local discrepancies in waste generation from almost zero in settlements with fewer than 100 inhabitants to 240 kg per capita in Riga. In the majority of sparsely populated regions (fewer than 20 persons per km^2), the total waste amount fluctuates between 0.2 and 0.5 m^3 per resident a year. In the biggest towns or cities, waste from blocks of flats exceeds 1 m^3 per resident annually, waste from private

Table 9.1: Waste from household and service sector*

kg / resident / year

	Latvia			Western Europe	Eastern Europe
	1990 a/	1994 b/	1995 b/	End of 1980s c/	
Rural areas	100-150	40-100	<110		
Cities	240-300	150-180	150-300	300-450	150-300

Sources: a/ Latvian Report for UNCED and Carl Bro;
b/ MEPRD, ECMC;
c/ Eurostat.

* Excluding construction and industrial companies.

Table 9.2: Municipal waste amount and collecting system, 1995

	Population (Number)	Waste quantity (1 000 m^3)	Waste per inhabitant (m^3/year)*	Share of non-industrial waste (%)	Inhabitants serviced by public waste collection (%)
Total	**2479 870**	**2 806.9**	**1.12**	**..**	**..**
Riga	821 180	1 386.8	1.65	48	88
Daugavpils	117 502	138.1	1.15	80	80
Jelgava	70 960	108.0	1.52	60	95
Jurmala	59 125	105.0	1.77	64	60
Liepaja	97 884	150.0	1.70	82	84
Ventspils	46 564	100.4	2.14	90	85
Rezekne	41 464	42.1	1.00	95	65
Other districts	1225 191	776.5	0.62	..	..

Source: ECMC, research 1995.

* Average density of 0.2 tonnes/m^3.

households and retail companies stands at some 0.7-0.9 m^3 per resident a year. About 70 per cent of waste originates from the seven largest towns with 50 per cent of the population (see Table 9.2).

The reliability of waste composition data is questionable as well. The organic fraction would be above 50 per cent in towns and cities, less than 10 per cent in villages, completely absent in small settlements, where they are used to feed animals or are composted. Table 9.2 shows that in particular the share of industrial waste in municipal waste may be more important in big cities. About half the industrial and construction waste is generated in Riga.

80 per cent of the urban population enjoys waste collection, against only 20 per cent in rural areas. Municipal waste collection and disposal are performed by waste collection services, 95 per cent of them owned by municipalities. Private companies operate mainly in the biggest towns, representing 50 per cent of the population served. Waste collection frequency and services seem to be satisfactory in the main towns (once a day), even if equipment is most of the time nearly obsolete. In

the rural areas the collection frequency is very low (once a week) and done with vehicles which are not designed specifically for this purpose.

In towns, individual houses are usually not serviced by the waste collection system, while blocks of flats in general are. This results from the fact that there is no legal obligation (i.e. no specific provision in framework laws and no municipal decree) for the user to pay for the service. Residents of independent houses avoid it; but for tenants in blocks of flats the service charge is included in their rent. Waste is partly collected in waste containers located along the street or in buildings. There are a few small-scale pilot projects for the collection of sorted waste in Riga, Jelgava and Valmiera.

Hazardous waste

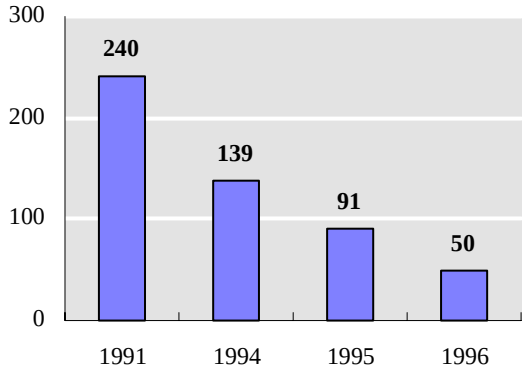
Calculations from the Project Implementation Unit on the Hazardous Waste Management System in Latvia of the 70 largest hazardous waste generators show that the total amount of hazardous waste fell from 240 000 tonnes in 1991 to about 50 000 tonnes in 1996 (Figure 9.2). The classification was changed in 1997, and the upcoming 1997 data will be in accordance with the EU classification. The results are currently processed by the Environmental Data Centre, but are not yet known.

The most recent data available (1994) show that a large part of hazardous waste is generated by ten big companies. Table 9.3 summarizes the most significant types of hazardous waste produced by these entities and their relative weight. They are mainly constituted of combustion waste and slags, sludge from industrial waste-water treatment plants and oil slime. The drastic reduction in quantities is the result of sluggish economic activity.

It is generally held that there is no illegal traffic in hazardous waste in Latvia. 900 tonnes of hazardous waste were exported in 1995 and 460 in 1996 in accordance with the rules of the Basel Convention (Table 9.4).

Figure 9.2: Hazardous waste generation, 1991-1996

1 000 tonnes



Source: Central Statistical Bureau of Latvia, 1997.

Radioactive waste

11.6 tonnes of low-level radioactive waste were produced in 1995, 5.9 tonnes in 1996. About 300 facilities of varying importance handling radioactive substances and waste are supervised. The bulk of them are medical and industrial research facilities (35), facilities with radioisotope smoke detectors (80), facilities maintaining nuclear gauges and others. Only 2 of them are of nationwide significance. The first is a research reactor (thermal power 5MW and fuel enrichment 90 per cent) which has recently been shut down. Its dismantling will generate 100m^3 radioactive waste. A strategy proposal for its decommissioning is being worked out. The second is a radioactive

Table 9.3: Estimated amounts of the most important hazardous waste types, 1990 and 1994

	1990		1994	
	1000 t	%	1000 t	%
Waste and slag from metal industry ***(1 generator)***	57.0	26	32.0	56
Waste-water treatment sludge, pulp and paper sludge, other purification work ***(10 generators)***	103.0	47	14.2	25
Oily slime ***(about 8 generators)***	13.0	6	0.6	10

Source: State of the Environment report, ECMC, 1995.

Table 9.4: Transboundary movements of waste, 1993-1996

Tonnes

	1993		1994		1995		1996	
	Export	Import	Export	Import	Export	Import	Export	Import
Glass	540	1	13	401	3	10 000	64	914
Plastics	35	243	30	530	940	966	884	202
Paper and cardboard	7 519	116	10 974	64	16 772	64	15 542	-
Nickel	15	-	126	-	1 562	-	1 222	-
Lead	207	4	671	-	1 001	-	585	42
Aluminium	2 291	-	2 723	-	7 678	635	4 636	159

Source: Committee of Statistics, Republic of Latvia.

waste disposal site (the only one in Latvia) operating since 1961. The safety of the oldest vaults would need to be checked and their risks reassessed. Apart from these, some unregistered sources are still being discovered from time to time, in particular on the former Soviet military sites.

Contaminated soils and sites

During the 50 years preceding independence, military bases covering about 100 000 hectares caused damage to Latvia's natural resources. Large quantities of abandoned materials and chemical compounds are in most cases hazardous and often stored in unacceptable conditions. They are a direct threat to the environment and human health. In 1997, a register of contaminated sites was set up. It classifies the 255 identified sites into four categories of danger. 31 fall in the highest two classes of danger. The old military sites are now under the responsibility of the State. So far they have not been cleaned up, as these operations are very costly.

Recycling and reuse

Possibilities for recycling common waste are limited in Latvia. Unfortunately, no information is available on the amounts of recycled wastes. It seems that no more than 5 per cent of waste is recycled. There are two facilities for glass recycling. One of them recovers glass from bottle banks in Riga sorted at the Getlini (Riga) landfill. It seems that they suffice to fully supply the Latvian glass industry and that there is virtually no market for additional amounts of recovered glass. There are also three plants for recycling plastics, but the market for recovered plastics is difficult and the plants rarely operate at full capacity. These plants are currently reprocessing recyclable plastics from Germany, which are then sent back. Very few opportunities exist for cardboard and paper. Cardboard and paper recovered at Getlini are exported for recycling. The only real market for recyclable materials is for scrap metal. There is one scrap-iron recycling plant. However, the amounts of metal scrap in municipal solid waste are too small for separate collection to pay off.

A separate system for the collection and recycling of construction and demolition waste has recently started in Riga, with two private companies. Several projects for composting and for the extraction of gas from landfills are under development. Car scraps are not causing problems so far, as the number of vehicles is small and some private companies dismantle old cars. However, as used tyres imported in big quantities to be retreaded have started to be of concern, the Environmental Protection Fund is now subsidizing their recycling. In June 1998, a modern oven for the burning of old tyres started operating at the Broceni Cement factory.

Some specific types of hazardous waste are also recycled. For instance, there is a centre for the treatment of used mercury lamps in Liepaja (which also takes used bulbs from Lithuania in line with the rules of the Basel Convention, 100 000 Hg-containing bulbs in 1997). There are facilities to treat X-ray film and photo-processing chemicals in Riga, where there is also a waste-oil treatment plant. Lead accumulators are exported to Sweden through Estonia for recycling (200 tonnes in 1996 and 1 000 tonnes in 1997).

Waste treatment and disposal

Landfilling is the main way of managing waste in Latvia. Nevertheless, in 1997, none of the 558 sites

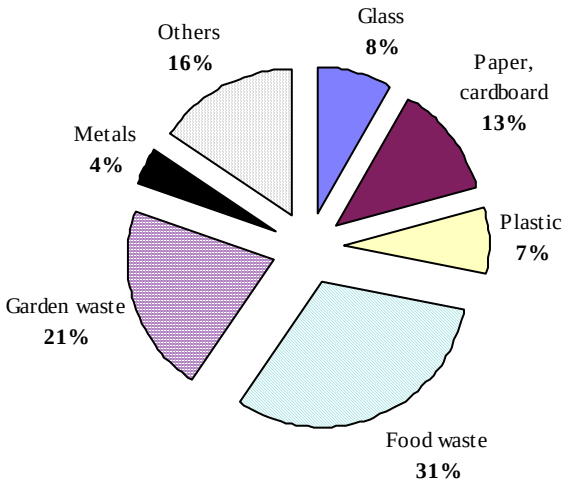
was operated according to appropriate environmental protection measures. Landfills are generally poorly planned and equipped and are overloaded most of the time. Their siting is decided only on the basis of land availability. They are sited on land that cannot be used for agriculture or housing. Quarries, wastelands and bogs are often used for this purpose. As a consequence, there are large dumps with all kinds of waste located in sandy areas or bogs. They have a serious impact on their surroundings, threatening groundwater plumes used as drinking-water sources. Environmental protection measures, such as controlling and recording incoming wastes, monitoring groundwater and rainwater, covering filled areas, are rare. Usually, landfills are operated under the responsibility of local authorities and the Ministry of Health.

It is impossible to assess the overall landfill disposal capacity as most disposal sites are established without proper design and illegal dumping is common. The majority of landfill sites are small (77 per cent smaller than 2 ha, most of them receive less than 1 000 m^3 waste/year); but those of large cities attain capacities as high as 3 million m^3. The biggest one, Getlini near Riga, is the only site where waste is properly recorded (See box 9.1), though this facility does not satisfy sanitary requirements. Elsewhere, there is no control or recording. The number of landfills is so high because municipalities are keen to have their own dumpsite, as (i) they then receive an income from the natural resource tax, (ii) it reduces the transport distance and therefore its cost, and (iii) it possibly reduces illegal dumping.

Illegal waste dumping is a serious concern. It is common in forests and ditches, as people often try to avoid paying for the service. Hundreds of illegal local waste dumps contain waste of unknown type and origin. The 160 old landfills that are closed continue to pollute groundwaters, and no corrective measures have been taken. In the course of the privatization of industrial enterprises, stockpiles of raw materials and by-products, obsolete pesticides, fertilizers and other chemical substances have been left without control. The situation is similar for many materials abandoned by the Soviet army. All these threaten human health and ecosystems.

Except in two cities where facilities have recently been set up, hazardous waste is not collected nor managed (stored or treated) separately. Hazardous waste, including hospital waste, is in general dumped together with municipal waste. In 1997, the management of obsolete pesticides was the first specific action carried out under the National Hazardous Waste Management Strategy (NHWMS, 1997) to manage hazardous waste separately. Of

Box 9.1: Riga city's waste management, 1997



(in % weight)

Average composition of municipal waste in Riga, 1997

Source: MEPRD.

1.3 million m^3 of municipal waste is collected annually in Riga. Two private companies have been contracted by the City Council to collect and transport it. Recyclable materials are sorted. Some glass and plastics are recycled. Other recyclables (paper, cardboard, ferrous and non-ferrous metals) are exported for recycling. Waste is disposed of at the Getlini disposal site. The management of the site, operating since 1973, has recently improved, as it was causing environmental problems. Nevertheless, it does not fulfil sanitary requirements. Waste is compacted on site. Enlarging the disposal site, upgrading it and producing energy from the captured landfill gas are all elements of a future project, which will cost US$ 25.2 million. Financing (in US$) will come from: Riga, 6 million; enterprise managing the landfill, 4.6 million; GEF grant 5 million; World Bank loan 8 million; and Sweden, a grant worth 1.5 million. The deadline for the project is 2002.

the 1 422 tonnes previously spread over the country at 420 uncontrolled sites, 130 are now stored at the special interim storage site for hazardous waste, which has been set up at an ancient military base in Gardene. The rest is concentrated and safely stored in two other places. A company has been created to deal specifically with these pesticides (transport them and manage the interim storage facility). The company is contracted by the State, which has a 10 per cent stake in it. The MEPRD owns the Gardene site and its buildings.

There is no strategy so far for the separate management of hazardous hospital waste. Except for some fractions incinerated on site, the bulk is simply dumped into municipal landfills (co-disposal). Local initiatives, as in Jelgava, are emerging to collect medical waste separately, even if it cannot be safely disposed of for the time being.

9.2 Policy objectives and management instruments

Waste management policies, strategies and objectives

In 1995, the NEPP acknowledged that there was a lack of policies for waste minimization and reuse, that waste management systems were underdeveloped and associated infrastructure lacking, and that inter-ministerial cooperation and coordination between the waste managers (MEPRD) and the waste producers (agriculture, industry, municipal system, etc.) were virtually non-existent. Therefore, the NEPP suggested a series of specific short-term as well as long-term measures, such as minimizing household and industrial waste generation, controlling waste imports, reusing waste, improving final disposal and cleaning up landfills. However, no specific actions could be carried out without a more thorough assessment of the quantities generated and more financing. In anticipation of the NEAP, a statement about Latvia's environmental investment policy set waste management as a priority, with minimization of waste production and improving the collection system as key objectives.

Subsequently, in 1997, the NEAP specified 15 actions to reduce the environmental impact of waste, including new laws to be drawn up. The aim was to minimize household waste through separate waste collection, particularly of paper, with subsequent recycling, and the introduction of an accounting system. For industrial waste the same aim was to be achieved by compiling information on waste sources, introducing waste minimization programmes in enterprises, assessing the impact of specific technologies, and eco-labelling. A better control of waste import was expected through the ratification of related international agreements, cooperation in the field of hazardous wastes with the other two Baltic States, a new procedure for the import of fuels, and better customs control on transit waste. To encourage the reuse of waste, tax relief for recycled goods, normative acts, the incineration or composting of sawdust and deposit-refund schemes were introduced. To improve the final disposal of waste, incineration, waste recycling and biological treatment were envisaged. Cleaning up landfills, reducing leaching from them, and controlling waste dumping were also considered.

The document also paid particular attention to diminishing the risks created by economic activities. It advocated 'good housekeeping', the introduction of modern technologies and the replacement of hazardous raw materials with safer ones. Two priorities were set: establishing safety lists in enterprises and technological norms to decrease the environmental impact of processes, both approaches paving the way for future integrated pollution prevention and control (IPPC) and environmental management systems (EMS).

Following the adoption of the NEAP (1997), two separate strategies were drawn up, both with the support of PHARE. The first one, the National Hazardous Waste Management Strategy (NHWMS) has not been formally adopted, but has already started to be implemented. The second one, the National Municipal Waste Management Strategy (NMWMS), is before the Cabinet of Ministers for adoption. These strategies set targets and specify the technical means to reach them. Neither strategy covers non-hazardous industrial waste.

Under the NHWMS, the development of the hazardous waste management system starts with the setting-up of storage facilities for obsolete pesticides and other types of hazardous waste. A further step will be the development of facilities for the incineration, treatment and disposal of hazardous waste. It was suggested that organic waste would be treated in a cement kiln, though currently this option is difficult to implement because of the financial difficulties of the cement facility that was proposing to incinerate the waste. The 1 000 tonnes per year of inorganic hazardous waste would be stabilized by chemical or physical treatment, and there would be a secure landfill for

the direct disposal of about 50 000 tonnes of hazardous wastes per year. It should be mentioned that for some years now attempts have been made, for reasons of economies of scale, to find common solutions with the two other Baltic States. So far, no agreement has been reached. The current option is to set up final disposal sites in each country. Guidelines should also be drawn up for the assessment and cleaning-up of old storage sites of hazardous waste. To this end, an inventory of the sites where hazardous waste has been dumped is under way. At present, as mentioned in section 9.1, the problem of obsolete pesticide stocks has been tackled first, and is being solved. Other hazardous waste will also be stored at this interim site till final disposal possibilities are found.

The draft national municipal waste management strategy (NMWMS) makes solving problems in those areas where inappropriate waste management is threatening human health its top priority. Only once environmentally sound disposal options exist, will the NMWMS follow the hierarchy of options of the EU waste strategy included in Council Directive 75/442/EEC: prevention, reduction (of quantity and toxicity), recovery and recycling, reuse (including for producing energy), and disposal. Thirdly, the ALARA principle (environmental impacts As Low As Reasonably Achievable) will be applied.

The draft strategy sets clear targets to combat illegal dumping, to reduce environmental impacts caused by landfilling, to prevent and reduce waste, and to increase reuse and recycling. The time frame is in general very tight and ambitious given the current infrastructure and economic situation. For instance, 90 per cent of all municipal solid waste produced is to be centrally collected by 2002. The number of landfills is to be halved by the year 2000, with the ultimate objective of having one landfill serving at least 150 000 inhabitants in 2010 and closing down all unsanitary sites (Project 500). By 1998, the packaging reuse system should be reintroduced (glass and polyethylene) for beverages, so that 75 per cent of used bottles are reused by the year 2002. In addition, the strategy wants big cities to meet these targets much sooner. A feasibility study is going on in North Vidzeme, a district where 75 landfills will be merged into one large, modern and environmentally safe facility. 88 municipalities are cooperating in this project. In the Talsi region, a modern landfill serving 650 000 inhabitants opened in 1997; its financing comes from local and national governments.

The next longer-term target will be the harmonization with EU standards. Because collection services are not yet enough developed and because there is a lack of recycling capacity, waste separation at source will not be compulsory under the NMWMS. The separation at source of hazardous waste will be introduced though, as soon as adequate disposal facilities for hazardous waste are available. Bulky waste from municipal waste treatment units will be collected and disposed separately from solid waste. Another independent collection system will be set up for hospital wastes.

In addition, guidelines for the construction and management of landfills and the selection of sites will be drawn up within the first year of the Municipal Waste Strategy. An inventory of existing dumping sites will be drawn up, and the management and monitoring of the sites will be improved. The cost of landfill construction until 2010 is estimated at 30 million Lats, and the cost of improving waste collection and transport during the same period at 23 million Lats. These substantial financial resources will come from the Public Investment Programme, local municipalities, IFIs and private investors. The Strategy's investment programme started to be implemented in February 1998.

Legal and institutional framework

The 1991 Law on Environmental Protection, revised in 1997, contains general principles for waste management. Natural resources should be used so as to generate a minimum of waste or no waste at all. The management of hazardous waste (including radioactive waste) is left to the State (MEPRD and its Regional Boards), while municipalities are entrusted with the management of non-hazardous municipal waste. Dangerous chemical substances, radioactive substances, domestic and industrial hazardous waste should be collected, stored, used and disposed of at specially designed sites.

At present, there is no umbrella law on waste. A series of laws already in force fully or partly regulate waste management: the 1993 Law on Hazardous Waste, which does not cover radioactive waste; the 1998 Law on Chemical Substances and Chemical Products, which does not explicitly exclude waste; the 1994 Law on Radiation Protection and Nuclear Safety, covering radioactive substances and hence radioactive waste; the 1990 Law on State Ecological Expertise, which requires an assessment of installations, landfills and other

waste management projects. A draft law on municipal waste is currently awaiting Parliament's approval. However, this set of laws does not cover non-hazardous, non-municipal wastes (i.e. common industrial waste). Some provisions in the Law on Natural Resources Taxes partly compensate for this gap.

With the draft law on municipal waste, permits will be required for the recovery and for the disposal of waste. This will apply to construction waste and some medical waste, but not to industrial waste or sludge. The draft law envisages a regulation on the classification of municipal and similar waste to clarify what kind of waste it will cover. Municipal hazardous waste is excluded from this law. Two other regulations on the construction, management and closure of landfills and incineration facilities will also be issued. Article 5 of the draft law on municipal waste calls for the Cabinet of Ministers to adopt a national municipal waste management strategy (details on the contents of the current draft strategy have been mentioned above).

The 1993 Law on Hazardous Waste applies to all activities that generate, collect, sort, reuse, process, transport, store or dispose of hazardous waste. The Law applies to "explosive, flammable, toxic, corrosive, chemically reactive or mutagenic" hazardous waste. Hazardous wastes are classified into five categories (waste containing oil products and other lubricants, organic solvents, halogens, cyanides and heavy metals). The 1996 Regulation on the order of preparing documents for activities with hazardous waste and the 1996 Regulation on the classification of hazardous waste and hazard criteria give more detailed provisions on reporting and divide hazardous wastes into very toxic, toxic and harmful waste.

The function of the Law is to provide for stricter control of dangerous waste. All actions/operations involving hazardous waste (generation, collection, transport, handling, treatment) require a permit. The import of hazardous waste is prohibited except if: (i) the purpose is recycling or processing; (ii) the exporting States are Estonia or Lithuania; (iii) the import is allowed according to an international agreement (the Basel Convention, which Latvia has ratified, for example). The Law does not prohibit the export of waste.

The general obligations of the Law aim at minimizing hazardous waste by encouraging its recycling and reuse, its separation, choice of safer raw materials, fuels, processes, etc. But there is no instrument in the Law to promote such measures (for instance, these issues are not integrated in the permitting process). This is an important gap. Among its other provisions is the obligation to inform the authorities of changes in production (notification procedure), to settle payments for hazardous waste activities, to monitor waste activities, to inform and consult the public.

There is a regulation to control the transport of hazardous waste. Also, Latvia adheres to the European Agreement concerning the International Carriage of Dangerous Good by Road (ADR) and to the London Convention. However, it seems that so far transport by rail is not subject to specific rules (see also Chapter 11). The import of hazardous waste is forbidden and is ruled by the Basel Convention (e.g. the bilateral agreements made with Lithuania and Estonia for certain types of hazardous wastes). It seems that customs controls are not systematic but rather sporadic and focus on specific substances. According to different interviewees, there is no illegal import or export of hazardous waste.

According to the Law, the Cabinet of Ministers decides on the modalities for the transport of hazardous waste, the siting of waste collection stations and hazardous waste facilities, defines the sanitary conditions at sites and determines the ecological insurance conditions. The responsibility for hazardous waste management lies with the MEPRD, which has the right to restrict, partially or totally, any action involving hazardous waste. Any industry generating hazardous waste should notify the Inspectorate for the Control of Hazardous Waste and Chemicals of its production, obtain a licence and then report on the hazardous waste produced yearly. Apparently, the licence contains obligations and provisions on disposal. Precautions should be taken in particular against the possible pollution of the soil. Inspectors have the authority to check how hazardous waste is managed on the premises. Inspections can be made on the sites at any time.

Transit through the country necessitates a permit from the MEPRD; transport within the country, a permit from the Regional Environmental Boards. Local governments supervise the implementation of the Cabinet decisions at the local level and may also issue permits after approval by the Regional Boards. They confirm the location of local landfills, their safety plans, as well as the contingency plans for activities producing hazardous waste. Hazardous waste is to be

managed by the enterprises that generate it. The most important enforcement powers are vested in the Regional Boards. Any violation of legal requirements is subject to criminal and administrative sanctions.

In 1994 the Law on Radiation Protection and Nuclear Safety was adopted and the Radiation and Nuclear Safety Division created under the responsibility of the Environmental State Inspectorate (ESI) (see details on the tasks of the ESI in section 1.3). There is no law specifically regulating the management of radioactive waste (which is excluded from the Law on Hazardous Waste). A permit is required for those handling radioactive substances (including waste) and radiation sources, but the permit is independent of the quantities involved. It is the responsibility of the proponent (entrepreneur) to ensure that radioactive waste and non-isotopic radiation sources are collected, stored, treated and placed in appropriate final storage. In early 1998, the legal obligation on users to establish a contract with the sole existing radioactive waste treatment facility was abolished. Since 1996, the management of this waste site has been under the direct responsibility of the MEPRD. Therefore, the MEPRD is in the ambiguous position of having to supervise the waste disposal site, and operate it safely.

Approximation with the EU legislation

The EU waste management policy aims at preventing, recycling and reusing waste, and ultimately optimizing its final disposal. It is based on self-sufficiency and proximity principles. The general legal structure is defined in a framework directive (CD75/442/EEC) which applies to all kinds of waste, and a directive specific to hazardous waste (91/689/EEC). These two pieces of legislation are spelt out in a series of directives on specific waste (spent oils, PCBs, PCTs, waste treatment sludges, batteries and accumulators, packaging, etc.) for which concrete objectives, deadlines and targets are given. This is complemented by regulations concerning waste transport.

According to EU experience, any approximation effort should start by aligning the core part of the policy, in particular establishing clear and unambiguous definitions. Staffing the competent authorities with qualified personnel is paramount. To bear fruit, any legal measure regarding waste management should be accompanied by action to raise public awareness, improve transparency and ensure successful implementation.

In Latvia, the cost of meeting EU waste management requirements has been estimated at ECU 233 million to 545 million. The progress in the approximation process of the White Paper Legislation (on Preparation of the Associated Countries of Central and Eastern Europe for Integration into The Internal Market of the EU) for waste management is as follows (early 1998):

- Approximation to Council Directive 75/442/EEC on waste (transposition deadline 31.12.1998): Latvia does not yet have a law on waste, only a draft limited to municipal waste (see above). There is no monitoring or reporting of waste produced, and no licence for waste management. The Directive calls for a waste management strategy and plans that do not yet exist.

- Approximation to Council Directive 91/689/EEC on hazardous waste (transposition deadline 31.12.1998): the general provisions and definitions in Latvia's Law on Hazardous Waste are not fully in line with the Directive. The Law should be amended, as should Regulation 353 on the order of preparing documents for activities with hazardous waste. A management plan for hazardous waste should be prepared. In particular, the current gaps in the Latvian Law are that it does not require disposal sites to be identified and inventoried and does not forbid the mixing of different categories of hazardous waste. Since 1997, the classification of hazardous waste has been similar to the EU classification. Also, since September 1996, Latvia has had a notification procedure for operations with hazardous wastes. Any action (including generation) involving hazardous waste should be notified to the authority before applying for a licence, which is compulsory. Similarly, a licence is obligatory for hazardous waste transport.

- Approximation to Council Directive 75/439/EEC on the disposal of waste oils (transposition deadline: 31.12.1998): few provisions have equivalents in Latvian law. There is so far no system for the safe collection and recovery of used oils. There are no disposal structures or procedures to prevent the illegal or inadequate disposal of waste oils.

- Approximation to Directive 96/59/EC on the disposal of PCBs and PCTs (transposition deadline: 31.12.1999): no Latvian legislation exists.

- Approximation to Council Directive 91/157/EEC on batteries and accumulators containing hazardous substances (transposition deadline: 31.12.1999): no Latvian legislation exists.

- Approximation to Council Directive 86/278/EEC on soil protection and the use of sludge in agriculture (31.12.1998). A recently issued regulation (late 1997) is in line with the Directive.

- Approximation to Council Directive 94/62/EC on packaging waste: no Latvian legislation exists.

Reporting

There is no obligation to report on the characteristics (quantity and quality) of common waste generated in municipalities or by industries. This explains the lack of information to describe Latvia's situation regarding waste. This problem will partly be solved with the upcoming draft law on municipal waste, as recording waste and providing information on the collection and transport of waste are among its obligations. However, the other provisions of the text refer only to municipal (and similar) waste. Reporting of hazardous waste quantities (generated, transported or disposed) is required by the 1993 Law on Hazardous Waste, and for radioactive waste by the 1994 Law on Radiation Protection and Nuclear Safety. The reporting of hazardous waste started only in 1997 (see Regulation 353 issued in September 1996), with a first series of related data due by summer 1998. Raw data are transmitted to the Environmental Data Centre for processing and compilation, are then sent to the Inspectorate for the Control of Hazardous Waste and Chemicals, and interpreted and disclosed by the Environmental Consultancy and Monitoring Centre. Rough registration of municipal waste is under way, but no database exists so far.

Economic incentives and financing

The Law on Natural Resources Taxes aimed in particular at minimizing the production and consumption of natural resources and environmental pollution, minimizing the production and sale of products harmful to the environment (including imported products and packaging), promoting new advanced technologies and laying the financial basis for environmental protection measures. All this results in a reduction in all kinds of wastes.

This Law introduced a tax on extracted mineral resources (construction materials) to minimize their use, and on different classes of waste. The tax on waste ranges from 0.25 Lats per cubic metre of non-hazardous waste, to 1.50 Lats for hazardous waste and 50 Lats for waste classified as highly hazardous. The revenues are used only for financing environmental protection activities such as the reuse and recycling of waste. Moreover, when goods or waste are reused or recycled (in particular mineral oils, accumulators and batteries, ODS, mercury tubes, tyres, packaging, plastics, glass), part of the tax is refundable. In 1996, these subsidies represented 356 000 Lats. Tax discounts can also be granted to enterprises that voluntarily carry out used-packaging management programmes and minimize waste (see section Charge Waivers in Chapter 3).

The tax payments are then shared between State (40 per cent) and local budgets (60 per cent). There are no guidelines for allocating these funds to waste management at the local levels, although that money is earmarked for environmental purposes. At the State level, 7 million Lats were transferred to the EPF in 1997, of which 27 per cent was allocated to the collection and recycling of hazardous waste, and 5 per cent to waste management. A first tender worth 0.4 million Lats will be launched soon by the EPF for financing investments in recycling projects. Any private company can apply.

At the municipal level, waste management is financed by (i) the user charges that inhabitants should pay, (ii) part of the 40 per cent of the natural resources tax that is returned to the municipalities, and (iii) part of the general municipal budget. The Law on Municipalities gives them the right to introduce local duties and levy their rates in agreement with the Cabinet of Ministers. In reality, the situation is far from ideal. The tariff for collection services is not uniform throughout the country. Many users (in particular in individual houses) avoid the user charge, or dump their waste illegally. As the natural resources tax is returned only to those municipalities that have an official dumpsite, many municipalities establish their own dump, but few spend the tax revenues on waste

management. In addition, in some regions many inhabitants are unable or unwilling to pay, so municipalities subsidize solid waste management from the general municipal budget.

Overall expenditures on industrial and municipal waste are shown in Table 3.6 (Chapter 3). It is clear that little money has been spent on this since 1991, thereby confirming that this was not a priority. Recently some investments have been made or are being made in the framework of the HELCOM Strategic Programme. For the NHWMS, ECU 2.4 million and ECU 222 000 come from EU PHARE and regional programmes, ECU 280 000 from the Danish EPA (grant), and 500 000 Lats from the State Budget. For implementing the Municipal Waste Management Strategy, 700 000 Lats will come from the State PIP in 1998 and 900 000 Lats in 1999, and 150 000 Lats from the Danish EPA (grant). Bearing in mind the 53 million Lat investments needed by 2010 for carrying out the Strategy, annual spending will soon have to increase substantially. Under HELCOM, a solid waste management project in Liepaja should be carried out and completed before 1999 (cost: US$ 22 million). Within its scope, a municipal landfill will be built according to recognized hygiene and safety standards.

Introduction of cleaner technology and environmental management systems

Since there is no national policy or strategy for introducing clean technology and environmental management systems, nor any financing from the Government or agreements concluded at ministerial level for cooperation with foreign partners, it is difficult to maintain any institution intended to build national capacity. Today not enough local experts have been trained to advise and put clean technology into practice, and there is too little technological information in Latvian. Moreover, it is difficult to reach out to industrialists, as they are not regrouped in associations. A recent report of the OECD/EAP Task Force about the progress made in countries in transition to set up national cleaner production centres reckoned that Latvia's Pollution Prevention Centre was close to the basic capacity level necessary to fly on its own. In fact, its survival its is currently in doubt. Supported at its inception in 1994 by the USAID World Environment Centre (WEC), the Pollution Prevention Centre aimed at educating, promoting and introducing advanced waste minimization, cleaner production programmes and environmental management systems in manufacturing plants. The Centre is mainly oriented towards seeking contracts with industries and is not sufficiently associated with education and training institutions.

The Centre for Environmental Sciences and Management (CESAMS) at Riga University (see Chapter 4) promotes a clean technology approach with the introduction of environmental management systems and a decrease in ozone-depleting substances (ODS).

The Centre for Standardization and Metrology has translated the ISO 14000 standards into Latvian and will adopt them in April 1998. The Ministry of Economy, which has previously strongly encouraged industry to introduce ISO 9000 quality standards, is now encouraging the introduction of the ISO 14000 series.

Various projects are supported by foreign partners. In addition to the support of WEC (USAID), the World Bank (project on landfills), EU PHARE (the Waste Management Strategy 500-, project for introducing IPPC directive and BAT principles), Denmark, Finland and Sweden are also financing feasibility studies. For instance, a project is being developed for the Daugavpils region in which an industrial hazardous waste management plan and environmental action plans for industry will be studied with Finnish financing. A strategy for cleaner technology introduction has been worked out with three full-scale demonstration projects (machine building, brewery and fish processing) financed by the Danish Environmental Protection Agency.

9.3 Conclusions and recommendations

Waste management is becoming an increasing problem in Latvia and has been recognized as such in the priority ranking of environmental problems. Currently economic activity is picking up and waste quantities are likely to increase. So far waste management infrastructures have not been improved. Today, in the face of the alarming situation, the formulation of strategies is often put in the hands of foreign consultants and specialists, thus limiting the involvement of local people at all levels. Waste management should be considered more as a domestic problem that is to be solved within the very limited financial possibilities which are now available. Solutions should more often be worked out or sought locally.

In the first place, a coherent legal framework is necessary. The Law on Hazardous Waste is the

main piece of legislation today. A few elements need to be brought in line with the corresponding EU Directive (e.g. definition, forbidding the mixing of hazardous waste with other waste, daughter directives on specific hazardous compounds). Another important piece will be the upcoming law on municipal waste. It is surprising that a gap will consciously be created if this law is adopted as it now stands, leaving common industrial, agricultural, construction and other non-municipal waste unregulated. Implicitly, the Law on Natural Resources Taxes provides economic incentives to minimize the generation of all waste. But it is not sufficient to regulate the reporting, collecting, handling, recycling and disposal of non-municipal waste, and the sharing of responsibilities and liabilities for its management. Similarly, there will be a void between the two strategies corresponding respectively to the two laws. Although common industrial waste is often seen as causing serious problems at the local level (e.g. Daugavpils), it will not be taken into account. A precondition for the necessary legislation in this regard is the development of the corresponding waste strategy.

Recommendation 9.1:
The legislation on waste that is currently being drafted should be brought fully in line with EU legislation, to prevent to the extent possible having to add or amend laws later. The umbrella laws should cover all categories of waste, including common non-municipal waste. Furthermore, a waste strategy including common non-municipal waste should be developed. Rules for the disposal of this waste should also be considered. There should be more emphasis on prevention, recycling and minimization of waste.

Building strategies and following up their implementation necessitate a regular flow of data describing wastes and the way they are managed. This is also essential at the local level to be capable of setting up relevant waste management plans. Currently, only the reporting of hazardous waste is compulsory, and was effectively put into practice in 1997. Nothing similar exists for other waste. Even municipal waste is not systematically accounted for. At the local level, waste should be measured and classified more systematically. Waste generators (including all kinds of waste and generators - municipalities as well) should have the obligation to inform the competent authority every year of the quantity and characteristics of the wastes they generated in the previous year.

Recommendation 9.2:
A particular effort should be made to improve the flow of information on waste. The whole data generation and dissemination process should be reconsidered with a view to describing all waste flows (and in particular that of hazardous waste) in as complete and reliable a manner as possible.

As Latvia is striving to approximate the EU legal framework, it will make special efforts to bring its laws into line. Completing the legal framework for regulating non-municipal common waste deserves particular attention, as does establishing a management strategy for the wastes once they are identified and quantified. Similarly, the permitting system could usefully complement the law if solid waste were covered in the permitting system, a measure which would help to better control and manage pollution generated by industrial facilities (see also Chapter 1). This implies that the reporting of generated quantities of industrial solid waste should be reliable, whether the waste is stored in situ or off the generator's premises. Reliable comprehensive data will improve knowledge about waste production and help to assess the overall pollution capacity of enterprises. This will eventually help to enforce the BAT concept and IPPC principles, reducing the possibilities of transferring pollution from one medium (regulated by permit) to another where no constraints exist at the moment.

Recommendation 9.3:
The permitting system should cover not only hazardous waste but also waste in general. The legal framework should be designed accordingly.

The draft NMWMS quite rightly puts human health protection first, before pointing to more rationalized methods of managing waste. Putting order in landfills and trying to restrict their number so as to focus on improving their operation and control is obviously the right thing to do. But the strategy has very ambitious targets within a very tight time frame, which seem unrealistic, given the current status of the infrastructure and the shortage of financing. It would certainly be useful to encourage the local level to develop initiatives and encourage the development of local solid waste management plans, as has already been done in a few cities (Riga, Jelgava) with the assistance of the Waste Management Association, which regroups about 2 000 professionals. Such plans should be worked out to encourage waste minimization and

recycling initiatives. Local plans worked out by local people are also a way to ensure that the population will participate in the decision-making and thus accept the decisions taken.

No significant progress can be expected if so little money continues to be spent on waste management (see Chapter 3). More efforts should be made to encourage industry to invest in waste minimization and waste (including hazardous waste) recycling. The introduction of cleaner technologies is an important step, as is recycling. Recycling is to be envisaged within the production process, as well as at a later stage, when waste has already been discarded by its user. All these possibilities require entrepreneurs who are aware of the opportunities, technology and potential benefits of minimizing and recycling waste so as to exploit them. They should also understand the implications of environmental legislation for their activities and be informed of the possibilities for financing offered by the State (see Chapter 3). For example, since 1997, a tax has been levied on the packaging of goods, and companies are paying for the packaging they use or import. The tax can be reallocated through tenders to projects aimed at recycling secondary materials and waste. But the difficulty now is to find candidates to propose projects.

Recommendation 9.4:
A strategy for the introduction of cleaner technology, specific legal provisions to encourage less polluting technology, and stronger financial incentives to encourage industry to introduce cleaner technology should be among the objectives of the Ministry of Environmental Protection and Regional Development. A pollution prevention institution is one important element for successfully promoting and introducing cleaner technology. Such an institution should help train local consultants in cleaner production and waste minimization, and environmental management systems.

Today, 'interface' institutions are lacking to help Latvia's private sector to integrate environmental considerations in their everyday business. Attempts have been made by the Latvian Clean Production Centre to inform and train business executives, by CESAMS to promote environmental management systems and by the Centre for Standardization and Metrology to promote the ISO 14000 standards. The Ministry of Economy favours the introduction of this ISO 14000 series. The MEPRD has encouraged bilateral contacts between Latvian and foreign partners on various projects to start introducing the clean technology concept. However, in-depth education/training is necessary. Young future business people should be educated to this end, and entrepreneurs should find structures that will inform them of the incentives offered by the Government and the application procedure. For instance, business schools could teach the benefits of introducing clean technology and environmental management in enterprises. Also, industry-wide or sectoral federations or associations need to be stronger. Such organizations generally play an important role in channelling information.

Consequently, it seems that special efforts continue to be required not only to promote cleaner technology, but also to enable all necessary business contacts to develop. In this connection, a pollution prevention and cleaner production institution could be an important partner, acting as a facilitator in the exchange of information between State environmental authorities, banks, enterprises, and research and training institutions like universities. Such an institution, preferably not directly linked to the MEPRD, should nevertheless receive some support from it in its inception phase.

Similarly, no progress can be made to reduce municipal solid waste and improve its management, if people do not pay for the pollution they generate. The law should be changed to make it compulsory for all citizens to pay for the solid waste they generate and discard, which is not the case today. The draft law on municipal waste will provide a legal basis for the polluter-pays principle, when adopted. At the local level, user charges should be designed to encourage individuals to diminish the waste they generate and sort it at source, and to recycle and reuse it as much as possible. Waste collection should be extended to all users progressively. As the economic context is not favourable, pragmatic tailor-made action at the local level should be encouraged. In particular, municipalities, depending on their size, could join others to optimize the management of their waste. To facilitate their regrouping, it would be advisable to modify the allocation of the funds from the nature resources tax. It should not be tied to the existence of a landfill on the territory of a municipality (article 11 of the Law on Nature Resource Taxes) but to another more neutral criterion (number of inhabitants, for instance).

Recommendation 9.5:
Waste management plans should use existing infrastructures and resources at all levels of

administration. As long as the existing multitude of administrative levels prevails, priority for management will have to remain at the national and regional levels. One objective should be to reduce the number of landfills, stepwise and at an affordable pace for the users. The possibility of using incineration with recovery of energy and other energy recovery methods from waste should be evaluated in this context.

Finally, as programmes, laws, strategies and actions regarding waste management and IPPC principles develop, it would be wise to staff the institutions at the ministerial, regional and local level with experts. At the Ministry, enough staff should be entrusted with implementing the two strategies. They should also ensure links and continuity between foreign and local consultants, specialists and other partners. Regional Board inspectors should be able to advise and negotiate about technology and acceptable technological performances, in addition to their policing role. Improving waste management skills is also needed for local decision-making. There is a strong need for more local experts/consultants in waste management and technology (see Recommendation 9.4).

For radioactive waste, the legal framework is clear, except concerning the sharing of responsibilities. Since 1996, the management of the radioactive waste disposal site has been put under the direct responsibility of the MEPRD. Therefore, the MEPRD is in the ambiguous position of (i) controlling the waste disposal site's compliance with the legal obligations, and (ii) operating it safely. Furthermore, it is now time to think of a strategy for the decommissioning of the nuclear research reactor which shut down in 1998. This should be done under the responsibility of the MEPRD.

Recommendation 9.6:
The nuclear safety regulator should be independent from the management of nuclear waste facilities. As a minimum, compliance with the nuclear safety regulations of the European Union should be achieved.

PART III: ECONOMIC AND SECTORAL INTEGRATION

Chapter 10

ENVIRONMENTAL CONCERNS IN AGRICULTURE AND FOOD PROCESSING

10.1 Latvia's agriculture at present

Natural resources and crops

The proximity of the Atlantic Ocean determines the climate of the country, i.e. moderately warm summers and moderately cool winters compared to inland areas on the same latitude, and frequent storms. Rainfall exceeds evaporation, resulting in a percolation moisture regime in the soil and in a podzolization of the soils. Of the 64 600 km^2 of total area, 39.3 per cent is cultivated, including 26.5 per cent of arable land and 12.3 per cent of meadows and pastures. 61.8 per cent of the agricultural land is drained.

In 1996, the main sown crops were cereals (winter wheat and summer barley) and fodder crops - mainly perennial grass - followed by potatoes. Because of climatic conditions, winter cereals are limited. Yields are comparable to those in the other Baltic States but considerably lower than in the neighbouring Nordic countries, in spite of comparable physical conditions.

There are regional differences in agriculture: lowlands (Zemgale, south and west of Riga) with precipitation of 550-600 mm/year, favourable for crops such as wheat, barley, sugar beet, fodder crops (alfalfa, clover), but not for potatoes and rye. Fruit and vegetables are also grown. The central and eastern highlands of Vidzeme, the southern highland of Latgale and the highland of Kuzeme are less fertile (precipitation of 700-800 mm/year). They have a more difficult relief and should be used mainly for cattle breeding and dairy production (Figure 10.1).

There has been a steady decline in agricultural land use in the past 40 years. After the restitution process began in 1990, the economic difficulties in agriculture led to a massive decrease in cultivated land (-29 per cent between 1990 and 1997) and in livestock numbers (-65 per cent between 1990 and 1996). As a consequence of the privatization process, much agricultural land was lost: because of a lack of credits to buy inputs, the fallow area rose to as much as 20 per cent of the total potentially arable land in 1995.

Structures and labour force

Since 1940, when 65 per cent of the population lived in rural areas and was employed mainly in agriculture (54 per cent of the total population), unemployment in the agricultural sector has created migratory movements to the cities. At present, only 31 per cent of the population lives in the countryside, which is below the European average, and 17 per cent is employed in agriculture.

Agriculture and food processing are the sectors where privatization is considered to have moved the fastest. The Baltic countries initially took the route of mainly distributing the land to its users, but were later faced with claims from former owners. The State-managed farms were succeeded by cooperative-type associations of producers and fairly widespread small-scale private farming. Since 1989, pursuant to the Law on Individual Farms, the land has been redistributed to owners or users (by virtue of land user rights): by 1997, 623 public farms had been replaced by approximately 300 000 private farms. This has led to a considerable increase in family farms (in 1997: 94 400) of a relatively small size (about 20 ha) including more than 30 per cent forest, as well as so-called allotments and private subsistence farms. More than 75 per cent of the farms have fewer than 10 dairy cows and 60 per cent fewer than 50 pigs. In 1997, about 92 per cent of the agricultural land was cultivated by private farmers, of which 40 per cent by part-time farmers with another source of income and producing off-market. Many of these farms lack working capital, so technical requirements are rarely met and cereal yields are low.

Progress in land reform is uncertain: this affects ownership rights (by 1995 only 5 per cent of the farmers had received title to their land, and owners

Figure 10.1: Agriculture and cattle breeding in Latvia

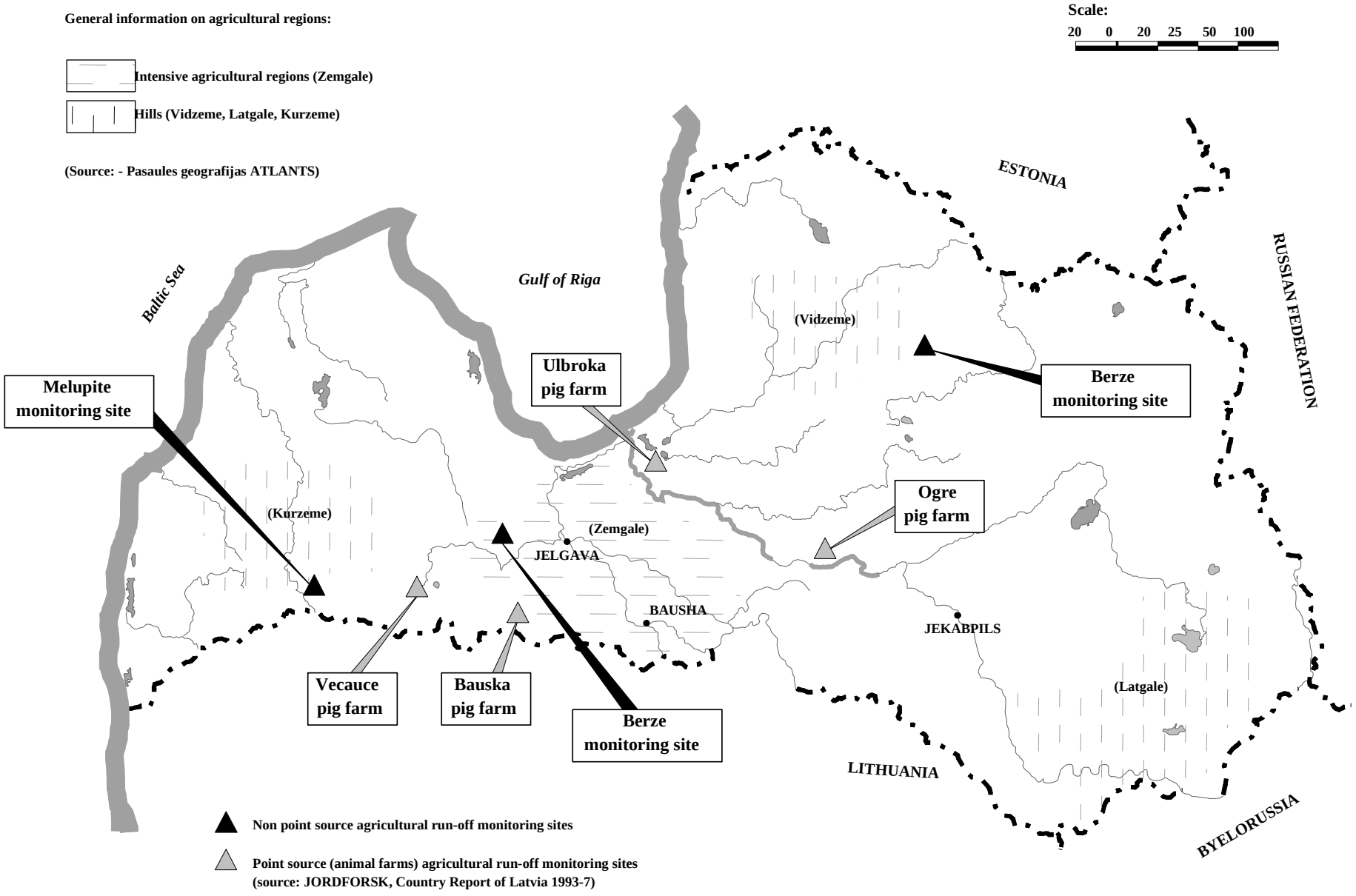


Table 10.1 : Structure of Latvia's agriculture, 1997

Type of farm	State farms, collective farms, statutory companies*	Peasant farms	Subsistence farms, allotments	Total / Average
Average size *(ha)*	254	14	5	..
(Number)	555	94 900	173 000	268 755
Total sown area *(%)*	20	46	35	100
Agricultural output *(%)*	24	35	41	100
Main products	cereals, sugar beet, fodder crops	cereals, potatoes, vegetables, fodder crops	cereals, potatoes, vegetables, fodder crops	
Cattle *(Units/farm)*	388	3	3	..
Average cattle *(Unit/ha)*	1	0	0	0
Use of mineral fertilizers *(kg/ha)*	53	19	10	23
Use of pesticides *(kg/ha)*	1	0	0	0
Environmental risks	(a) Irrational use of chemicals and fertilizers	Low level of information to the new farmers	Low level of information to the new farmers	
	(b) Large animal farms: pollution of surface waters	Increase in uncontrolled use of chemicals	Increase in uncontrolled use of chemicals	
Suggested measures	(a) Licence for plant treatment: registering of treatments and fertilizer application	Licence for plant treatment: treatment made by a licensed company (that carries out the registration)	Licence for plant treatment: treatment made by a licensed company (that carries out the registration)	Controls by the Regional Environmental Boards
	(b) Storage capacity, spreading and service to farmers.			
	(c) Strict enforcement of liability for pollution			

Sources: Statistical Book of Latvia (1997);
Report on Environmental Protection and Use of Natural Resources (1995).

* Including 95 large animal farms.

had until 1997 to claim their land from the users) and also the agriculture credit system. Since the start of the land redistribution, the size of the rural population has risen slightly (from 29.5 to 31 per cent), as has employment in agriculture (from 16.5 per cent in 1990 to 18 per cent in 1995, but with a relatively low productivity). Large-scale hidden unemployment is reported.

In 1992, former collective farms were converted into 464 farming companies, cultivating 18 per cent of the agricultural land. By 1995, 60 per cent of those had gone bankrupt. In 1997, it is reported that little more than 100 continue to work about 8 per cent of the agricultural land. A high level of unemployment resulting from the abolition of collective and State farms is reported in rural areas, in some eastern districts up to 26 per cent (the further away from Riga, the higher the unemployment rate). It affects people at their most productive age (in 1996: more than half of those between the ages of 30 and 49). The crisis has affected other branches of the economy in the rural areas.

Not only is the level of general education considered low in rural areas, the majority of the new farmers are thought to know too little about entrepreneurship and environmental issues. Two thirds of them have no agricultural training.

Production levels and economics

Agriculture is an important sector of Latvia's economy. It accounted for 22.5 per cent of GDP in 1991, but this share shrank to 7.9 per cent in 1996. The agricultural sector, which was integrated in the economy of the former Soviet Union, exported 40 per cent of its butter, 25 per cent of its beef and pork, and 20 per cent of its poultry. In exchange, animal feed was imported from the former Soviet Union. The agricultural sector was unable to recover from the disruption of trade relations with the countries of the former Soviet Union. Exports of livestock and dairy products and imports of cheap animal feed were no longer possible and the output of this sector declined steadily, dropping 58.6 per cent between 1991 and 1994. Most of its exports still go to the countries of the former Soviet Union (75 per cent in 1994, while imports from those countries have fallen). The OECD countries are sources of imports (47 per cent) rather than export destinations (12-14 per cent), due to trade barriers and quality standards imposed on products. Between 1990 and 1994, animal production dropped 60.5 per cent and crops 37.8 per cent. Since then, however, crop production has increased steadily, whereas animal production has continued to decline, because of massive illegal imports of meat from the EU. The Ministry of Agriculture estimates their volume at 20 to 30 per cent of all imported meat.

Crop yields have fallen more slowly than the use of inputs (-28 per cent for cereals and pulses between 1990 and 1995). Less land is now under cultivation and efficiency has fallen too. In 1996, yields almost recovered to the level of the early nineties, while sown areas increased slowly. Dairy farming accounted for 55 per cent of agricultural output before the transition. Milk production had been declining continuously since 1990, but seems to have increased since 1995.

Large companies and peasant farms achieve comparable yields. Their yields are higher than those of allotments. However, for vegetables (specialized) companies do significantly better than both peasant farms and allotments. Family farms have a higher milk yield per cow than companies.

Prospects and governmental policy

It is expected that Latvia will cease to be an animal production « facility », processing imported feed and re-exporting meat, and instead become a country whose agriculture is based on local resources and local markets. Animal production will be reduced to meet the needs of the local market. Wheat production for human consumption has already increased. The employment rate in agriculture is expected to decrease in future as productivity improves. Probably, the current small farm structures will be concentrated. The population in remote districts is ageing (41 per cent of people employed in agriculture are aged over 55). Their living standards are low. The young people tend to find employment in the cities. It is also uncertain how long the impoverished rural and semi-urban classes of Latvian society will need an allotment for subsistence (according to the Ministry of Agriculture, half the families produce half their own food).

At the moment, Latvia cannot meet its own food needs, not even for cereals. Especially the level of production of meat, dairy products and eggs is inadequate. Before the transition, they were produced for export, but now they lack the cheap animal feed, on which they depended and which have to be imported. Vegetables and potatoes play an important role in the diet of many families and their cultivation accounts for a big share of the land use of family farms and allotments. Consequently, the area for growing them has remained stable (potatoes) or decreased only slightly (vegetables). Because of the high inflation rates in the early nineties, about 70 to 80 per cent of the population finds it hard to afford the minimum "consumer basket". Consumption of basic products, mainly animal products, decreased sharply. For instance, milk consumption dropped 32 per cent. In 1995, households spent 45 per cent of their income on food, which is high by European standards. This means that food prices cannot be increased yet.

Since 1993, minimum prices have been fixed only for wheat and sugar beet. In 1994, government subsidies were introduced to boost exports of cheese, butter and cereals. To protect its internal market, there are much higher taxes (20 per cent) on imported products that can be produced in Latvia (pork and beef, cereals, dairy produce) than

on other products (<1 per cent), and preferential access for products from the EU is limited by a quota system. On the whole, the food trade balance (mainly prepared foodstuffs) enjoyed a surplus in 1995, after having shown a deficit.

In 1992, petrol subsidies were granted to farmers, and since 1994 the Government has supported farmers who use high-quality seeds and breeds, to improve the quality and productivity of agriculture. On the whole, the Producer Subsidy Equivalent (PSE) calculated by the OECD was 8 per cent in 1995, compared to 49 per cent for the EU. Agricultural prices are significantly lower than in the EU.

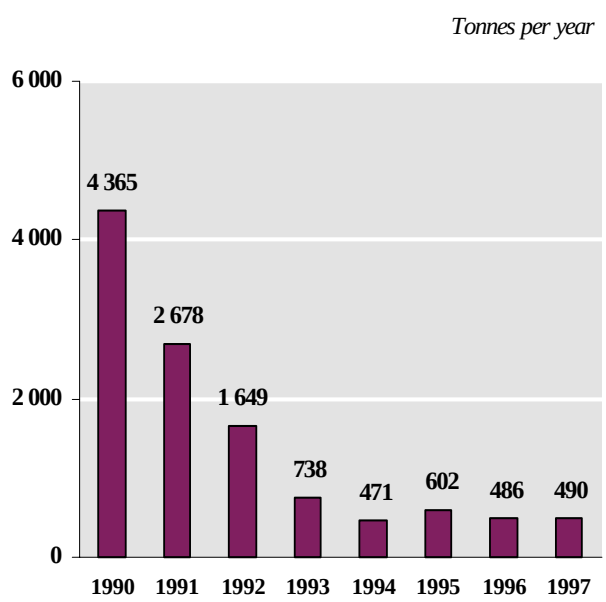
It is one of the Government's objectives to discourage the excessive concentration of residents in Riga and its surroundings. A "Concept for Latvia's Regional Policy" (prepared in 1995) is to be implemented through a programme accepted in 1998, aimed at developing the rural area as a whole. In this programme, diversified agriculture plays a central role, although non-agricultural projects are also promoted. The economic diversification of rural areas will be a major concern in the coming years. The Fund for Rural Development, created in November 1994, supports rural development in general, granting cheap credits for agricultural or non-agricultural activities. Since 1994, the Fund for Financing Agriculture has granted credits from funds provided by the World Bank, also at a preferential rate. With the support of PHARE, the Agricultural Advisory Centre is now promoting the «Diversification of the rural economy» in an attempt to develop local and traditional specialities. A «Union of Latvian Organizations for Organic Farming» was founded in 1995 and a «Regulation concerning the certification of products of organic farming» has been approved (1998). The already high share of household expenditures on food could nevertheless hamper the development of this market.

10.2 Environmental issues in agriculture

Water

The main sources of pollution - besides untreated municipal waste water (phosphates) - is run-off from agricultural land (nitrates 68 per cent and phosphates 37 per cent), due to the intensification of agriculture between 1960 and 1980. Groundwater pollution is limited to regions where agrochemicals were used intensively (district of Adazi: nitrates) or to areas around large pig farms (Bauska and Ulbroka: nitrates and phosphates.

Figure 10.2: Pesticide use in Latvia, 1990-1997



Source: IEDS database.

Soils

The most widespread soils in Latvia are light to moderate sandy clays with low natural fertility. Only 6.9 per cent of soils consist of productive luvisols (Zemgale). Both mineral and organic fertilizers are essential to maintain productivity and soil fertility. The use of mineral fertilizers dropped 95 per cent between 1988 and 1995 and the use of organic fertilizers more than halved (due to the strong decrease in livestock). Lack of manure has already led to a reduction in organic matter (humus).

23 per cent of the soils are acidic (pH < 5.6) and the soil requires liming, but liming, too, has dropped drastically: the area treated in 1995 was only 2 per cent of that treated in 1990. Acidification has anyway increased since the mid-80s, with no satisfactory explanation. Soils suitable for agriculture are relatively free from heavy-metal and pesticide pollution, but acidification may lead to the release of heavy metals in the soil.

Erosion does not seem to be the main concern for agricultural soils in Latvia. However, heavy machinery and crop rotations unsuitable for the soil's characteristics, physical relief and climate conditions are leading to soil degradation. 14.7 per cent of the arable land is threatened by wind

Table 10.2: Fertilizer use in Latvia, 1980-1997

Tonnes per year

	1980	1985	1990	1993	1995	1997
Fertilizers- Total	**293 800**	**338 500**	**322 200**	**44 500**	**21 600**	**33 600**
of which:						
Phosphate fertilizers *(P2O5 content)*	79 700	86 900	..	..	4 200	6 000
Nitrogen fertilizers *(N content)*	106 500	123 900	..	..	11 500	19 400
Potash fertilizers *(K2O conten*	107 600	127 700	..	..	5 700	8 200

Source: IEDS database.

Box 10.1: Case study: being a new farmer in Latvia

Together with his mother and with the help of employed neighbours, Mr. A. operates a farm in the South West of the country, specializing in cereals. Mr. A. finished his studies at the agricultural university and graduated in water management. He decided to take over the farm because funds for his research studies were running low.

The farm, which had been established in 1926 by Mr. A.'s grandfather (17 ha), was returned to the family in 1990. Mr. A. enlarged his farm by buying privatization vouchers and, in 1997, he had 82 ha in ownership. He rents another 54 ha from neighbouring farms. The forest area is marginal (7 ha). The acreage of the farm will not increase any more (no land available), but now the privatization process has come to an end and land can be considered as acquired by the owner. The farm is used by the BEOROP project as a demonstration farm in the Mellupite watershed.

The dominant soil texture is silty loam with a moderately high pH (6-7) and all cultivable land was tile drained during the Soviet period (partial reconstruction in 1992). Winter wheat (45 ha), summer barley (30 ha), oats (25 ha) and grass mixed with clover (10 ha) are the main crops. Grass that is not used for the dairy cattle (5 cows and some young animals) is ploughed under. Crop rotation is planned plot by plot according to the type of soil and the market situation. Mr. A. plans to reduce the size of the dairy herd for his own use and specialize in pig fattening instead (because the market is favourable). He hopes to increase his capacity from 80 places (planned for autumn 1998, which makes altogether 0.18 LU/ha) to 400 (0.55 LU/ha). His cereal production of lower quality can be used rationally and profitably as feed for the pigs. Mr. A. would like to reach a cereal production of 5 tonnes/ha, which is the EU average and double the national and local average.

As a demonstration farm, Mr. A.'s is equipped with machinery and he performs tasks (e.g. manure spreading) for his neighbours. For instance, a manure tank of Russian origin was equipped with a Swedish device (pipes) for discharging the liquid manure directly into the soil.

Mr. A.'s ecological interest focuses on good agricultural practices and sustainable agriculture with correct use of the mineral and organic fertilizers produced by his cattle and pigs and a regular crop rotation, which is easier to plan (increasing the share of perennial grass and rape) now that the farm size is settled. He tries to adapt his farming intensity to the climate and the soil quality. He has no concerns about Latvia joining the EU, because Latvian agriculture is not at all subsidized by the State.

There are another 16 farms in the watershed (size between 5-40 ha), of which only one can be considered as big (108 ha). Six of these farms have no machinery; one of them nevertheless has 30 ha of agricultural land. Mr. A. thinks that in the future there will be room for 2 to 3 farms in the watershed. Mr. A.'s farm approaches the size that is envisaged by the Ministry of Agriculture (100-300 ha) and is already much larger than the size defended by the Latvian Farmers Federation (30-60 ha). As for «farm hospitality», Mr. A.'s mother caters (traditional food) for the numerous visitors participating in seminars and demonstrations that take place on the farm premises.

erosion and 24.3 per cent by water erosion. The washing away of the fertile topsoil into the rivers contributes to their eutrophication.

Air

In 1990 agriculture contributed two thirds of CH_4 and more than half of NO_2 emissions. CH_4 emissions stem from the enteric fermentation of domestic animals and from the decomposition of manure under anaerobic conditions (e.g. when stored over a long period). NO_2 emissions originate in the process of nitrification and denitrification of mainly organic and mineral fertilizers: urea is a fertilizer producing a relatively high degree of NO_2. Nitrogen deposition may be a problem for sensitive ecosystems, as it increases the acidity of the soil. Latvia expects to reduce by half CH_4 and by over 85 per cent NO_2 emissions from agriculture, once the use of organic fertilizers is mastered and

optimized, and excessive N fertilizing can be prevented, based on advanced nutrient balance calculation.

Semi-natural habitats

The semi-natural grasslands (meadows, 33 per cent of the agricultural land or 12 per cent of Latvian territory) are threatened both by the discontinuation of their traditional use (pasturing and haymaking) and by intensified agriculture methods (use of fertilizers, higher level of exploitation).

The formation of collective farms destroyed the traditional landscape, and the increase in the use of agrochemicals contributed to the decline of some species (see Chapter 8). In rural areas, people were detached from their traditional farmlife. Since 1940, the extent of agricultural land, mainly grassland, has decreased continuously, and the Ministry of Agriculture estimates fallow land to total 400 000 ha or 16 per cent of agricultural land. Idle land includes not only land of poor quality (such as sands in the coastal zone), but land abandoned because of unfavourable property schemes (land restored to non-farmers) or because it is remote from good transport connections. It is expected that most of that area will be overgrown by forest (+5 per cent) over a 10-year period. The Ministry of Agriculture plans to reforest the land of poor agricultural quality. Idle land is turned into forest by the owners, because it is more profitable and less complicated to use, or turns into forest naturally.

Since 1945, inland wetlands, one of the main natural biotopes in Latvia, have been threatened by drainage operations for agricultural purposes. 15 per cent of the bogs - the largest share in Europe - has been reclaimed for agricultural use. Since the transition, drainage has not extended and hardly renewed because of uncertain property schemes and lack of means.

10.3 Fisheries

Present situation and prospects

Fish and fish products are among Latvia's leading export commodities. After the sharp decrease due to the privatization process and the economic difficulties in the early nineties, production has been increasing again steadily in recent years. Net exports rose from 12 385 tonnes in 1995 to 67 793 in 1997. 90 per cent of the fish products are exported and exports have nearly doubled since 1993. The main species (in weight) are sprat and Baltic herring, followed by jack mackerel and cod (see Chapter 8). 80 fishery companies (186 vessels) and more than 2 000 individual fishermen are operating in the Baltic Sea and the Gulf of Riga. However, the fleet should be renewed. High-sea fishery (in the economic zone of Mauritania), which was important till the early nineties, is declining continuously and is expected to continue doing so because of the limited prospects worldwide and the lack of means to equip the vessels.

Compared to the marine catch, the catch in internal water (rivers and lakes) is marginal (bream, river lamprey) and has decreased in recent years. However, 2 900 persons are engaged in inland water fisheries and there is a large possibility of increasing both fish catch (4 to 5 times) and aquaculture (carp, rainbow trout).

Fish and canned fish production (traditional «Riga sprat in oil ») employs 12 000 persons. It represented 3.4 per cent of GDP in 1996 and has potential to rise. Fish accounts for 15 per cent of the total output of the food-processing industry. To provide fish processors with raw material, Latvia imports frozen fish. Market studies have stressed the need to restructure the industry in conformity with world market demands by improving packaging and quality (to EU standards) and widening the range so as to be more competitive. Renewing its fishing fleet rather than expanding it will allow Latvia to use fully its accessible fish resources.

Resource management

All natural fish resources are State property and Latvia administers fishing rights in its economic zone, on the basis of the Law on Fishing (1995). Industrial fishing requires a licence and a lease agreement, delivered by the Environmental State Inspectorate, according to the limits determined by the National Board for Fisheries (Ministry of Agriculture). The Regional Boards are responsible for delivering licences (the quota is based on the fishing gear) for fishing in coastal and inland waters. Fish breeding is also subject to a licence, delivered by the MEPRD. The licence fees (paid to the « Fish Fund ») are used for restocking and fish research. The fishing rules (registration and fees) are to be renewed in 1998 for the Baltic Sea (this was done in 1997 for inland angling), in order to improve supervision.

10.4 Objectives and instruments

Legislation applicable to agricultural activities

The restored Constitution dating from 1922 does not yet contain provisions directly pertaining to environmental protection or to the role of sustainable agriculture. The basic law is the 1991 Law on Environmental Protection. It includes basic provisions that are also applicable to agricultural activities, such as:

- the inhabitants' right to receive information about environmental quality (art. 12);
- the inhabitants' duty to respect or improve the environment (art. 16) ;
- the right of supervision by inhabitants or their organizations (art. 47);
- the right to compensation for environmental damage (art. 56) ;
- regulations governing the use of harmful substances, plant protection and fertilizers (art. 26).

The Law on Hazardous Waste (1993) and the Law on Plant Protection (1994) are also applicable, as are other legislative provisions concerning the minimum ecological knowledge required of environmental specialists, the polluter-pays principle, pollution discharges and excessive pollution, liability and criminal and administrative sanctions for failure to protect the environment, the normalization of special ecological situations and its financing by the State or organizations like collective or State farms, and the Law on State Ecological Expertise (1990).

Provisions applicable particularly to food processing include the obligation to take out ecological insurance and the need for a permit for substance outflow, as well as 'ecological certification' of foodstuffs. The Law on Water (1973) requires a permit for the extraction and consumption of water, and puts a limit on discharges. The Regional Environmental Boards deliver the permit, against payment (see Chapter 3).

Objectives and institutions

The National Environmental Policy Plan (NEPP) contains a special chapter on agriculture, with actions focusing on fertilizer use, soil protection against erosion and protection of water, in particular in the Baltic Sea, from agricultural run-off. An inter-ministerial committee (of the Ministry of Environmental Protection and Regional Development and the Ministry of Agriculture) was

Box 10.2: Case study: Pollution of the Gulf of Riga by agriculture and its impact on fishing

The Gulf of Riga (19 000 km^2) is a relatively shallow water basin. Water exchanges (25 per cent each year) take place through the strait of Irbe. 53 per cent of the waters discharged in the Gulf of Riga are transit waters. With 12 kg of fish per hectare, the Gulf of Riga is one of the richest fishing grounds of the northern hemisphere.

The Gulf has been subject to heavy pollution and eutrophication in the past 20 years and is considered to be one of the most eutrophied ecosystems of the Baltic Sea. Its ecosystem is clearly affected and its recovery remains a priority for Baltic cooperation. Pollution discharges from the rivers depend on the water discharge flow rate and are larger in wet than in dry years.

The Baltic Sea is reported to be polluted also by atmospheric depositions of ammonia, mainly from manure gases (1994: 15 000 tonnes). In the nineties, the health of the Gulf of Riga seems to have stabilized and a significant decrease in eutrophication is likely. The winter concentration of nitrates has diminished in the past years, but that of phosphates increased even further. This situation seems to stem from the internal biochemical processes in the Gulf. The relatively small Lielupe river contributes large amounts of nutrients to the Gulf because its drainage area includes large areas of arable land. Point source pollution in the Gulf of Riga is monitored by the Norwegian-Latvian project (JORDFORK 1995-6). A particularly alarming problem is the poor state of waste-water treatment in Riga, as two thirds of the city's waste water go untreated into the Daugava river estuary. Nutrient run-off from large animal farms for different liquid manure spreading has been a study area of primary concern. The European Bank for Reconstruction and Development has arranged an investment package worth ECU 18 million to solve it.

A study showed evidence of a change in the population of phyto- and zooplankton (increase in the biomass and decrease in the species diversity) that could be related to the level of eutrophication, although no clear connection was found. The National Board of Fisheries estimates that, on the one hand, the eutrophication that caused a proliferation of zooplankton had a positive effect on the herring population (a popular species among Latvian fishermen), but, on the other, it led to the destruction of the herrings' spawning grounds. The survival of cod larvae (another popular species) is threatened by the lack of saline and also oxygen-rich waters. Despite some progress, the Helsinki Commission considers pollution due to agricultural activities to be the major cause of marine eutrophication and one of the most serious environmental problems in the entire Baltic Sea. There is an urgent need to implement the HELCOM recommendations for agriculture.

appointed in 1995 to coordinate the policies relating to the environment and agriculture.

A target determined by the NEPP in relation to agricultural water pollution is that total nitrogen discharges from point sources and the loss of bio-substances from agriculture should both be halved by 2020 compared to 1995. The legislation relating to animal density, manure storage, agricultural waste water, application of mineral fertilizers and organic manure and winter crop cover will be drafted in 1999. Nutrient circulation models are developed as a tool for the management of different farm types and river basins in order to create norms that respect the HELCOM recommendations (such as 1 LU/ha, 8-month storage capacity for slurry pits) and that are adapted to Latvian reality. This is the aim of the monitoring network set up by the BEOROP project (run-off from non-point sources, with Swedish partnership) and the JORDFORSK project (run-off from point sources, i.e. animal farms, with Norwegian partnership).

Latvia is a member of the Baltic Environmental Agricultural Run-off Project (BEOROP), collaborating with the Swedish Ministry of the Environment and the Swedish Board of Agriculture. It focuses on educating and informing farmers inside and outside a chosen watershed, Mellupîte in Latvia, and on monitoring a site where ordinary agricultural practices are used. The activities combine all measures aiming to master the run-off of ammonia emission from agriculture, such as advanced nutrient balances, manure handling and storage facilities, spreaders for manure and fertilizers and sprayers for pesticides (in a machine pool), field plot trials and also water monitoring.

The priority goals of the NEPP are reducing the loss of bio-substances (-50 per cent between 1990 and 2010) and halting soil degradation. Only better crop rotation with integrated crop systems together with a better management of rural landscapes will help to solve that problem.

Box 10.3: Case study: food-processing industry restructuring to meet environmental requirements

Food processing is a traditional industry in Latvia. In 1995, it accounted for almost 40 per cent of industrial production at current prices. After a general decline, food processing was one of the sectors that recovered in 1996. Privatization began in 1993 and was completed in 1995 in the dairy, meat and cooked food industries, and partly completed for the sugar refineries (2 out of 3), but is less advanced in the cereal-processing industries (7 out of 17). Most industries are run as processing cooperatives or by producers' associations. They are too numerous and suffer from a lack of technical and marketing skills.

A dairy company. The Rigas Piena Kombinats, which was totally renewed in 1991 to meet Finnish standards, is one of the six that are EU-certified. It was founded as a joint-stock company in 1994 (half owned by milk producers), and is one of the largest and technologically most progressive milk factories of Latvia (6 large factories and 30 smaller ones). Its main products are treated and packed milk, yoghurts, cream and ice cream. 60 per cent of the milk is supplied by large farms (200-1 000 cows) and 40 per cent by small farms (2-5 cows). The company's lorries collect the milk directly from the farms within a radius of 50 km of Riga and beyond at collecting points for small farms. The milk is paid for mainly according to quality standards, and in order to ensure quality the company has set up its own advisory service for producers.

The milk components are completely used in the different products, so that no waste is produced, in contrast to plants producing cheese and butter. The chemical products (NaOH, HNO_3) used for cleaning the equipment are recycled and reused. The water-milk mixture occurring at the beginning and at the end of the production process is returned to the producers for their cattle. The rest of the waste water is treated 100 per cent and the sludge is taken over under contract by a waste-water treatment plant in Riga.

A fishery company. Like the other fish-processing companies, IMS (300 employees) was a former kolkhoze that was privatized and transformed into a joint-venture company with a German partner. Its main products are the traditional «Riga sprat in oil» (70 per cent), mainly for export to large Russian cities, and salted herring (25 per cent), mainly for export to Japan. The company is not able to export to the EU, because it is not EU-certified (it is engaged in the long and difficult process of HACCP certification). The export quotas are also limited for Latvia, especially for herring. The products are certified kosher and have been exported since 1997 to Israel and the United States. The domestic market takes 0.5 per cent of production. Because the Russian market may be unstable, the company will try to export to other central and eastern European countries, for the time being without certification. The company is supplied with fresh fish under contract by fishing companies that are not necessarily shareholders of the company. Another objective of the company is to acquire fish resources outside the Baltic Sea in order to increase its capacity.

Solid fish waste from the processing industry is recycled by another company as animal feed. Like many other fisheries along the Gulf of Riga, the company has to contend with the limited capacity of the waste-water treatment plant that it shares with the neighbouring municipality and another fish company. The Ministry of Environmental Protection and Regional Development has plans to improve the functioning of such plants by encouraging the introduction of cleaner technology into fisheries because they are the main economic activity on the Latvian coast and have good prospects of development. The fisheries in general and this company in particular have been selected for the implementation of demonstration projects in cleaner technology financed by the Danish Environmental Protection Agency (see Chapter 9).

Retaining the mosaic pattern of the landscape is also a NEPP objective. There is some research into the biodiversity of agro-ecosystems (mentioned in the National Report of Biological Diversity). The 1997 Law on Protected Belts contains provisions for all habitats bordering bodies of water (no fertilizing, no pesticide use, no clear-cutting or drainage). Isolated trees (such as traditional oaks) are recorded and protected by special legislation. The new Law on Environmental Impact Assessment includes criteria of significance for agricultural projects, such as water management projects.

The promotion and the protection of more common habitats, species and landscape elements are not mentioned in any specific legislation and will have to rely on the territorial planning regulations (1994) and the Law on Regional Development for the planning and implementation of biological networks. The Law on Land Use and Survey (1991) is an important instrument for the protection of nature outside protected territories. Local governments and municipalities will be made responsible for the protection of nature within their jurisdiction. Every municipality has to prepare a plan for its territory, in accordance with the regulations of the Cabinet of Ministers.

Environmental training and advisory service

The Latvian agricultural advisory service was established in 1991 in cooperation with the Ministry of Agriculture and with Danish support and advice, and was converted in 1997 into a non-profit organization. It promotes the formation of other associations and unions (organic farming, a centre for rural innovations, rural tourism). This service plays a key role in farmers' education and the training of agricultural teachers and advisers, including environmental training. Environmental education is a key element in the Law on Environmental Protection (art. 4). The environment is now a compulsory subject on the agricultural training curriculum at the university level. Environmental training is also provided in agricultural schools, in the context of the PHARE projects for rural development.

10.5 Conclusions and recommendations

There are a number of laws - all designed to be compatible with EU legislation by 2005 - either in force or under preparation that directly affect agriculture and the environment. All these laws and regulations will include applicable EU directives. The objective will be to consolidate them with a view to ensuring an integrated and harmonized development of the rural regions.

Latvia is able to implement « good agricultural practices », according to the HELCOM recommendations relating to agricultural practices, together with the codes for « best environmental practice » (Attachment 1 to HELCOM Recommendation 8/2 and ministerial amendment of March 1998), applicable to new farmers, who must learn everything about their present production conditions. On the basis of HELCOM, the Ministry of Environmental Protection and Regional Development has issued a document describing the Environmental Policies in Agriculture to be developed in Latvia.

The Law of Plant Protection now not only makes provision for the registration of products, the supervision of the retail trade and of the equipment for treatment, but also provides that farmers require a licence to treat plants with the products listed in the Register of Plant Protection Products. It is reported that 12 000 farmers have obtained this licence after specific training. They may apply treatments for other farmers. The State Plant Protection Station (Ministry of Agriculture) carries out supervision with its own inspectors, independently of the Regional Environmental Boards.

Latvia is a Party to the Helsinki Convention and issued a Law on the Protection of the Marine Environment of the Baltic Sea (1994) based on it. Latvia makes concrete and active efforts to implement it, in conformity with articles 3 and 6 of the Convention. Although the Law on Land Use and Survey (1991) seems to contain restrictions on certain agricultural practices, it is reported that neither the Law on Agriculture (1997) nor any other legislation requires specific agricultural practices, for instance to forestall soil and water pollution due to leakage of agrochemicals. Consequently, there is a gap in Latvia's environmental legislation. This gap should be bridged in the long run. In the short run, it can be partly remedied by practical arrangements, which could be linked to plant treatment licensing and the compulsory registration of plant protection and fertilizer use on farms, such as: type of chemicals, dilution, quantity, date and plot of use. It could also be extended to traditional practices like grass burning of extensive meadows in early spring. This can be an efficient way to keep open surfaces. Rather than banning this method, it should be

promoted and used by persons with adequate training, provided for instance as part of the training required for the plant treatment licence. Furthermore, suitable methods (mowing, burning) for maintaining the habitats have to be tested.

Recommendation 10.1:

- *Farmers should not be eligible for financial support (grants, loans) from the State for projects without proof that their farming practices respect basic environmental requirements, i.e. sound crop rotation, livestock units per surface unit within the prescribed limits, adequate facilities for storing and spreading manure, plant treatment under licence (including the practice of burning extensive meadows in early spring) and recording of treatment, and adequate maintenance of extensive surfaces of high biodiversity.*
- *The Regional Environmental Boards must have access to the recorded data of plant protection and fertilizer use on the farms. They should be able to monitor the maintenance of semi-natural habitats by the farmers, especially where farmers apply for State support for a farming project.*

The pollution due to agricultural activities is not expected to increase to the level of the eighties. The number of cattle (especially in large animal farms) will not increase considerably and it is hardly conceivable that agricultural inputs will again reach their previous levels, because of their high cost. Furthermore, the Agricultural Advisory Centre, in coordination with Raziba specialists and supported by government policies, promotes better agricultural practices, based on the HELCOM recommendations. It puts great emphasis on good use of animal fertilizers (Project 978 of the Advisory Service) and of mineral fertilizers and pesticides (Environment-Agricultural Project Balticum). However, the trend will be to increase yields: statistics show that the use of agrochemicals has been increasing again since 1994. In this connection, the Agricultural Advisory Centre is of strategic importance. It was created with the help of the Danish advisory centre and is considered to be an excellent institution, whose standards are comparable to those of western European advisory centres. It is capable of mobilizing a great number of farmers. It represents a very efficient and strong vehicle for environmental policies in agriculture, which ought to be used by the Ministry of Environmental Protection and Regional Development.

Recommendation 10.2:
The Agricultural Advisory Centre should also be financially supported by the Ministry of Environmental Protection and Regional Development for its environmental activities, possibly requiring special institutional arrangements between the ministries involved.

In a country with sandy soils, where a majority of the agricultural land is drained, mastering agricultural run-off is essential. Animal manure must no longer be considered as a waste but as a resource for fertilizing crops, improving yields, when properly applied, and soil fertility (organic matter content). However, the farmers lack not only the technical knowledge but also the financial means to install proper storage and spreading facilities., Few farms have them. Also, such facilities are often prohibitively expensive.

Large animal farms are considered as industries: they need a water use permit and are currently subject to controls. The new Law on Environmental Impact Assessment prescribes EIA for animal farms whose capacities are above a certain threshold. Surprisingly, these capacities are higher than those specified by Directive EU96/61/EC and will have to be adjusted when the legislation will be brought in line with EU legislation. Before transition, manure was dumped only on part of the arable land. After restitution, some large animal farms were left with very little spreading area. The full storage lagoons of abandoned farms are also an environmental concern.

Recommendation 10.3:
Large animal farms with insufficient land for spreading manure should be considered industrial operations, subject to the regulation on the use of sewage sludge in agriculture. They must be equipped with adequate storage and spreading facilities and an administrative scheme should be developed to enable them to apply to the Environmental Fund for financial help. Like the waste-water treatment plants, they must seek contracts with farmers for the use of spreading area and offer a complete service for spreading the manure on their customers' land.

HELCOM (13/10) issues recommendations on the minimum soil cover with crops in the winter and research is continuing on intercalar crops. The Ministry of Environmental Protection and Regional Development holds that such a measure is difficult to implement in a country with a short growing

season. Other measures such as avoiding autumn mould-board ploughing, incorporating straw and intercalar sowing of grass in cereals are used or can be used. Latvia's soil map has now been adapted to FAO norms, and recommendations will be issued against erosion (avoiding the ploughing of hills in the central part of the country, Vidzeme) or soil compaction, for instance through better crop rotations (integrating more animal husbandry) in heavier soils, in particular in the neighbourhood of sugar mills (Mellupite, Jekabpils). The Government's objective is to make these mills 75 per cent self-sufficient in sugar beet, and it is essential to conserve the country's good agricultural soils.

The biotope and species diversity of agro-ecosystems will depend on the agricultural policy and on the application of rural development programmes at the local level. The Agenda 21 for the Baltic Sea region has been approved and the protection and promotion of habitats will depend on the political determination at the local level and the way in which the local population are associated with the physical planning of their « pagast » (parish). Owners or users of surfaces of interest in this connection should sign contracts with the municipality and enjoy tax relief, if they maintain them properly. By contrast, the tax on land use could be doubled for idle land.

Recommendation 10.4:
In the process of physical planning at the municipal level, semi-natural areas of high biodiversity value have to be identified and their management agreed together with the local population, the nature protection organizations and the Ministry of Environmental Protection and Regional Development.

Fishing is set to become an increasingly successful economic activity in Latvia. The number of inspectors and of properly equipped vessels is reported to be too small. The National Board of Fisheries and Marine Environmental Boards are concerned by illegal fishing, which is difficult to check. According to their estimates, half the catch in the coastal and inland areas by individuals is illegal. Coastal species (turbot, flounder, eelpout) are fished intensively (5 per cent of the total catch in the Baltic Sea and increasing). Countermeasures have to be taken, because scientific investigations show evidence of over-exploitation of a number of fish species (plaice: size of the catch and number of young fish are decreasing), as well as of dwindling resources of cod, salmon, zander, European whitefish and especially ides. It seems easier to monitor fishing companies on the high sea, with the collaboration of other Baltic Sea ports. However, the main concern remains the pollution that may be caused by the future Lithuanian oil terminal.

For fisheries, the main goal will be to create responsible fishery mechanisms at all levels, from the National Board of Fisheries and Marine Environmental Boards to the local municipalities and the individual fishing companies and fishermen, and to improve their coordination.

Recommendation 10.5:
A more intensive monitoring system (financed by the fishing licence fees) is necessary to assess the effect of fishing methods and catches, and of other activities, on the evolution of fish species and on the marine environment in general, as well as on the profitability of the fishing industry. The environmental consequences of the production of canned fish should be minimized.

In OECD countries, a wide political debate about the future role of agriculture is currently taking place, broaching issues such as self-sufficiency, proximity, multifunctionality, export of specialities, etc. All this is probably also debated at ministerial level in Latvia with a view to adjusting agricultural policy to EU requirements. But, in addition, the Latvian Government should also prepare public opinion, as Latvian taxpayers will have to co-finance the external benefits of their agriculture. In other words, how much support does agriculture need in order to be able to perform also the environmental tasks that society wants to entrust to it? The inter-ministerial committee should be open to discuss policies with interested private associations, such as environmental NGOs and farmers' associations.

Recommendation 10.6:
The Ministry of Environmental Protection and Regional Development and the Ministry of Agriculture should promote a debate about the environmental role and impact of Latvia's agriculture among its entire population. Similarly, the two ministries should strengthen their cooperation to improve training schemes for the benefit of small farmers.

It is the task of the MEPRD to protect the environment, including against the influence of other sectors such as agriculture. Seeking more support from agronomic research institutions (such as Raziba (founded in 1928) and the State's Plant

Protection Station (founded in 1958)) and green movements in this matter would certainly be beneficial. The MEPRD could use them for instance by supporting financially some research related to the environment (e.g. on erosion, soil conservation, etc.).

Recommendation 10.7:
In its task of coordinating activities relating to environmental issues in agriculture, and of summarizing the information provided by all institutions concerned, the Ministry of Environmental Protection and Regional Development should rely more on the long and precious experience of old agricultural institutions and give the necessary weight to new environmental policies in agriculture and ease their acceptance by the agricultural sector.

Chapter 11

MANAGEMENT OF THE TRANSPORT OF OIL PRODUCTS

11.1 Recent developments in the transport of oil products

The need for transport of oil products

Latvia provides facilities for the export of Russian oil by sea. As a result, most transport of oil and oil products (see Table 11.1) in terms of volume is in transit (about 60 to 70 per cent). At the same time, transport and communication services make a major contribution to GDP (between 20 and 25 per cent in real terms in recent years).

Table 11.1: Oil transport by rail and pipeline,* 1993-1997

Million tonnes

Mode of transport	1993	1994	1995	1996	1997
Railway	..	..	11.5	17.7	20.1
Oil main pipelin	14.9	15.3	15.2	18.0	19.2
Oil product pipel	0.0	0.6	2.9	2.7	3.0

Source: Department of Statistics, Monthly Bulletin of Statistics, May 1998.

Note:
* The data for crude oil transport cover both crude oil pipelines passing through Latvian territory.

Pipeline and maritime transport

Table 11.2: Cargo loaded and unloaded in main ports, 1993-1997

Thousand tonnes

	1993	1994	1995	1996	1997
Ventspils	22 226	27 941	29 623	35 745	36 781
Liepaja	426	1 100	1 440	1 609	2 296
Riga	4 669	5 844	7 454	7 457	11 213

Source: Department of Statistics, Monthly Bulletin of Statistics, May 1998.

In 1995, Latvia's shipping register counted 579 ships.

Ventspils has been a major export port for the Baltic countries and adjacent Russia since the 18th century. Its oil terminal has a capacity of 785 000 m^3. Two pipelines link the Ventspils port with the Russian Federation. The main 426-km-long oil pipeline (720 mm diameter) connects Ventspils with oil extraction areas. Its maximum transport capacity is about 16 million tonnes per year. The main oil product pipeline is 329 km long (500 mm diameter), and has a maximum capacity of about 5 million tonnes. A third pipeline for the transport of crude oil passes through Lithuanian territory, linking the Lithuanian oil refinery in Mazeikiai (the only refinery in the Baltic countries) to the Russian extraction areas. The maximum capacity of this refinery is similar to that of the crude oil pipeline ending in Ventspils.

In 1991, exports of oil and oil products from Ventspils totalled 17 million tonnes. In 1994 they amounted to 19 million tonnes. Cargo throughput in 1997 was 37 million tonnes. This covered 20 per cent of the world's potash trade, 15 per cent of Russian oil exports, and 74 per cent of Latvia's transit goods. The liquid cargo terminal for crude oil and oil products is the largest trans-shipment terminal on the Baltic coast. It has six berths for the trans-shipment of crude oil and oil products, all with a maximum draught of 17.5m. It has a total capacity of 25 million tonnes, and a 940 000 m^3 storage capacity.

The recent deepening of the sea has allowed an increase in the size of tankers authorized to enter the port from 85 000 DWT to 120 000 DWT. Total project costs were around US$ 60 million. The Western Pipeline Systems Technology company is considering another project for the building of a new oil pipeline to Ventspils. Project costs are estimated at almost US$ 900 million. The pipeline would increase the capacity of Latvia's oil export facilities to 36 million tonnes a year. A final decision on the project is not yet taken, and it is too early in the decision-making process to start public consultations or an ecological evaluation.

Rail transport

The total length of railways in Latvia was about 2 400 km in 1995 – practically unchanged since 1980 - of which 350 were electrified. With this rail infrastructure, Latvia ranks fourth per capita among the eleven countries in the Baltic Sea area. Almost all tracks are broad-gauge and about 300 km are main lines in double track. Latvia plans to transform about 60 km to double track by the year 2010, but to maintain the total length at its current level. Electrification will increase marginally. During the same period, passenger transport by rail is expected to decrease slightly, while goods transport by rail is thought to double. Air emissions from transport are expected to increase for all pollutants (by about 40 per cent), except sulphur dioxide, expected to decrease by about 25 per cent.

11.2 Environmental effects of the transport of oil products

Effects associated with pipeline and maritime transport

The environmental effects of pipeline transport, according to the Latvian pipeline transport company (LatRosTrans), are twofold. The first concerns the integration of the requirements for the operation of pipelines in the land ownership titles of the plots concerned after privatization. This problem is primarily a legal one, not uncommon to other legal issues linked to the privatization of land. The problem has potential effects mainly on land use and, thus, on territorial planning.

The second problem is that of the identification and treatment of oil-contaminated soils, mainly as a result of past management practices of pipeline transport. Areas contaminated with oil have to be identified and related soil pollution has to be managed. The number of oil spills in pipeline transport since independence is considered minimal. Losses appear almost exclusively in connection with pipeline transport of oil products (a loss rate of 0.01 per cent is considered normal), but are usually attributed to illegal withdrawals rather than to leakage.

Other effects occur in the coastal zone of Latvia. The city of Ventspils has a coastline of 12 km. The port activities affect this area, primarily through the construction of a breakwater, the regular dredging of the navigation channel and the dumping of dredged sediments into the sea. The usual sea currents moving north along the coast wash out the coast rather intensely. The construction of shipping channels, together with dredging and dumping of dredged spoils at sea, interrupt the flow of sediments to coastal areas, thus aggravating coastal erosion. The washout material is blocked at the breakwater in the port, where sand and gravel are being sedimented. Some of these sediments drift into the navigation channel, increasing the need for dredging. Furthermore, sand and gravel reaches the city's beach, a pebble cover gradually overgrowing it under the influence of wind. However, on the whole, the Ventspils area is not considered to be the area most affected by coastal erosion in Latvia.

The Ventspils City Council has carried out research into this problem since 1993. It was established that the coastline in the Ventspils area had retracted between 30 and 80 metres (maximum width of eroded basic coast in this century of 90-200 m for Baltic ports) during the last fifty years, due to the washout. Planting the shore and moving the dumping sites for dredged spoils closer to the shore are among the measures taken to halt coastal degradation.

Effects associated with rail transport

Between spring 1996 and spring 1998, an environmental audit of the Latvian railways was undertaken by a subsidiary of the Swedish State Railways, sponsored by the Swedish International Development Authority. In addition to providing training and general management proposals, the project aimed to recommend solutions to the most pressing environmental problems, and to prevent pollution. The recommendations were based on an inventory of the major current environmental problems that were found in depots and marshalling yards of the Latvian railways. Among the auditing results are reports for seven depots and marshalling yards. Also, an environmental policy was developed for the Latvian railways.

The project was primarily concerned with the company's internal environmental management system. Nevertheless, the recommendations made in the report, as well as the surrounding text, permit to draw inferences with regard to both types and causes of the major environmental effects from railway services in Latvia:

- There is substantial soil pollution with oil or oil products, which appears to be primarily caused by leaks from freight tank wagons of the rolling stock. Soil pollution is not always only superficial, but may go down into the earth to a

depth of 6-8 m, affecting groundwater (for example, in Ventspils).
- The extent of soil pollution is aggravated by over-dimensioned systems of tanks etc., making installations cover relatively large areas.
- Oil and fuel unloading areas, track areas, storage areas for hazardous wastes and unsafe storage areas for excavated contaminated soils are among the most problematic contaminated areas related to the transport of oil products by rail.
- Contaminated soil is currently not being treated. Soil remediation methods are being tested. Burning of some hazardous wastes on railway sites is (still) legal and practised.

11.3 Policy and management regarding the transport of oil products

Legislation and policy objectives

The transport of dangerous goods is regulated by a series of legal instruments. In particular, the Russian 1996 Guidelines on the transport of dangerous goods by rail are being applied. In 1994, an instruction was issued on action in emergency situations during the transport of dangerous goods by rail. For the regulation of maritime transport, the most important legal basis is MARPOL. The Latvian Maritime Regulation ('Maritime Code') entered into force also in 1994. The Maritime Code includes all necessary provisions concerning the transport of dangerous goods. In addition, the Law on Ports (1994) and regulations specific to each port - but approved by the Ministry of Transport - complete the range of legal instruments for maritime transport.

For pipeline transport, the Russian Federation, Belarus, Lithuania and Latvia normally apply Russian regulations to all matters related to pipeline technology. In addition, the usual provisions for the transport of dangerous goods, civil defence etc. are applicable and enforced. It is currently being discussed whether or not a special law regulating pipeline transport could present systematic advantages by combining the provisions relevant for pipeline transport that are currently found in various legal instruments.

The protection of the actual pipeline is laid down in the Law on Specially Protected Nature Areas. A 50-metre-wide corridor along the pipelines is designated as a specially protected area. The Law specifies the activities that are authorized in this area. The necessary inclusion of activity constraints in the land register is contracted out by LatRosTrans and is fraught with the general problems surrounding the identification of ownership titles on land. It is expected that this work will near completion in 1999.

The development of maritime and railway traffic is a priority in Latvia's environmental investment policy. Likewise, reducing pollution in the Baltic Sea to fulfil international commitments is a priority. The Cabinet accepted a National Transport Development Programme on 14 November 1995. State programmes exist for all transport modes.

The basic goals and strategic guidelines of the National Transport Development Programme include aims and tasks that also relate specifically to rail and maritime transport. Among them are the maintenance, rehabilitation and development of the related transport infrastructure. The integration and coordination of transport systems cover seaports as well as railway installations. The Programme explicitly recognizes the need for environmentally friendly transport and makes special reference to high-quality fuels, minimization of environmental impact of all modes of transport and improvement in the transport of dangerous goods.

The related programme for railways and railway stations notably mentions the need to develop freight terminals and improve freight transport, loading and unloading technologies. Also, railway corridors should be developed further, to increase rail freight carrying capacity. East-west rail corridors are planned to end in each of the three major Latvian ports, passing in all cases through Krustpils, and for the ports of Liepaja and Ventspils also through Jelgava. The corresponding programme for seaports is cast in very general terms. It aims at establishing attractive conditions for cargo handling and servicing ships at a world level. The broad aims for goods transport refer, among other aspects, to the need to make it safer.

A special sub-programme for traffic safety includes specific aims for each mode of transport. It focuses on the number of rail accidents. For maritime traffic, the emphasis is on reducing the risk of accidents and technical failures, as well as on preventing costs that could be incurred through environmental pollution. A separate sub-programme devoted to the establishment of

environmentally friendly transport systems makes reference to the need for safety during the transport of dangerous goods.

The National Environmental Action Programme (NEAP) of 1996 includes first of all one major action area on the environmental impact of transport. One focus is on the generation of nuisances in transport activities; another is on problems related to the transport of dangerous goods. In addition, a number of projects regarding risk management are included in other major action areas. Some of these projects relate to general provisions, but others are tailor-made for specific modes of transport. In the second category are projects like risk reduction schemes for particular railway installations or the drawing-up of mode-related plans either to reduce transport risks or to contain accidents.

Institutional responsibilities

The Ministry of Transport supervises the National Transport Development Programme, including the control of its implementation. A Coordination Council assists in the task. The Ministry of the Economy and the Ministry of Finance are key ministries in the necessary coordination. The Ministry of Environmental Protection and Regional Development also participates in the work of this Council.

The institutions involved in the management of the transport of dangerous goods include the road, railways and maritime transport administrations, the MEPRD, the health authorities, border control and customs administrations and various local authorities. The Board of the Ventspils Port Authority is composed of representatives of the national Government and of the municipal administration. LatRosTrans is the only institution in Latvia concerned with pipeline transport.

Instruments used in management

The Maritime Code implements, among other things, the IMO conventions – such as SOLAS, MARPOL, LOAD LINE and others, to which Latvia is a party. Regulations also exist for smaller ships. They are promulgated by the Ministry of Transport. However, the EU approximation process implies, *inter alia*, the following stage I measures:

- The Regulations on Granting Qualifications to yachtsmen require tougher requirements for obtaining a licence for waterway transport.
- The Regulations on Certification of Seafarers require harmonization with the requirements of STCW 95.
- Ship registration needs to be reviewed.

The treatment of ballast and bilge water is regulated in accordance with MARPOL provisions. Treatment capacities for ballast and bilge water at Ventspils terminal amount to 65 000 m^3 each (bilge water with a maximum of 20 per cent water, no dispersants, and ballast water containing 30 to 80 per cent of water, equally no dispersants). Treatment efficiency is such that the oil content of treated water is lower than 0.5mg/l.

Passenger and cargo carriage, employment offices for seamen and underwater works are licensed. Previous licensing of other activities has been discontinued, but is planned to be reintroduced into the ongoing revision of the Maritime Code.

Latvia's railways are entirely State-owned, in the form of a public stock company. "Latvian Railways" is a member of UIC and an associate member of the CIS Council of Railway Transport. A law on railways is under preparation, awaiting the conclusion of necessary research into organizational matters. The future law will be fully harmonized with European Directive 91/440/EC.

Instruments do not seem to be available to deal effectively with the major problem of leaking tank wagons of the rolling stock. The current rules and practices tolerate 2 per cent of leakage, probably triggering maintenance and repair of wagon bottom valves and manhole covers only at leakage rates above this figure. Maintenance obviously is extended to the rolling stock of the Latvian railways.

A project worth ECU 49.5 million (with a loan worth ECU 20 million from EIB) to modernize Ventspils port is under way. A railway modernization project worth ECU 90 million is under preparation (EIB and EBRD will each provide loans worth a third of that sum), while the reconstruction of the east-west rail corridor is in progress (project worth ECU 2.6 million, PHARE-funded).

The monitoring of pipelines is based on the registration of pipeline pressure and follows standard practice. The identification and remediation of areas where soil has been polluted in the past are contracted out by LatRosTrans to three specialized companies. These companies also

intervene in the event of new oil spills. The contractors operate in contact with the Regional Environmental Boards.

Mechanisms exist in Latvia for evening out differences in revenues between municipalities to a certain extent. The purpose of this procedure is to support development efforts in those municipalities that are unable to raise enough revenue. The fund is substantial (between 58 and 84 million lats during recent years) and is financed with earmarked taxes. Its expenditures depend on the relative revenue position of the applicant municipality.

11.4 Conclusions and recommendations

Transport services constitute a major industry in Latvia. Their past and present contribution to gross domestic product is substantial and, in all likelihood, will remain so after the present changes in the economic structure. At the same time, a predominant share of the transport of goods consists of trans-shipments of oil and oil products. The hazardous character of much of the goods carriage not only gives rise to particular transport risks and the generation of typical categories of waste and types of pollution of special concern. It also requires special environmental management efforts, both in a national and in an international context - owing to the high share of goods in international transit. It could probably be argued that the need to integrate environmental aspects into sectoral development policies in Latvia is more important for the transport sector than for any other sector.

There is a threefold need for special environmental management with regard to oil transport. Firstly, there are special requirements to organize an optimal framework within which protection against negative consequences of such transport could develop. This framework ought to contain adequate legal and institutional provisions for the protection against oil transport related pollution. Secondly, measures to reduce the risk of environmental pollution from the transport of oil products need to be taken, particularly with regard to soil pollution. Thirdly, the treatment of wastes or polluted materials generated in oil product transport needs to be envisaged.

The legal provisions necessary for state-of-the-art handling of the risks and consequences of oil transport by sea seem to be globally in place and adequate, although certain improvements remain possible (see Chapter 6). All relevant international conventions appear to be normally enforced. Latvia's national legal instruments are harmonized with international practices and adapted to national circumstances. The Maritime Code is currently being revised. A major outcome will be the introduction of further licensing procedures by the Ministry of Transport. This will introduce additional safeguards against the risk of unqualified harbour operations.

For the transport of dangerous goods by rail, Latvia strictly applies recent (1996) regulations approved in the Russian Federation. It is felt that the ongoing approximation process will not require any adaptation that would create enforcement problems. Likewise, the regulations do not cause any practical problems when applied together with the relevant regulations for other modes of transport.

Pipeline transport yields a similar picture. Particularly positive is the use of common practices regarding technological issues among the neighbouring countries. A small problem might exist in a certain diffusion of legal instruments applicable to pipeline transport as a whole. However, this issue is already under study and there are no doubts that the respective study will lead to the most convenient solution.

The institutional arrangements for the transport of oil in and through Latvia are on the whole less fully developed. Most transport of oil by rail is in transit. However, the risks and actual pollution associated with it are to a large extent in Latvia. Management of these environmental consequences could probably be facilitated, if Baltic cooperation were more intensive. For example, to prevent the currently excessive leakage of oil from tanks of border-crossing wagons, technical inspections and the certification of tank wagons should be coordinated. Furthermore, maintenance practices by the railway companies should perhaps be harmonized more effectively. As a first step, this cooperation could be initiated by the MEPRD, together with the Ministry of Transport. The development of a tank certification scheme by the Latvian Ministry of Transport could provide a starting point for such cooperation, possibly within an already existing framework for Baltic cooperation.

<u>Recommendation 11.1:</u>
Cooperation should be extended to cover the joint development of common practices regarding the technical characteristics and maintenance of the entire rolling stock used in Latvia, particularly the

tank wagons used for the transport by rail of oil products and other dangerous substances.

The leakage of oil products from the rolling stock is an urgent problem, which needs to be brought under control quickly. Practical measures therefore need to be taken to reduce such leakage to the maximum possible extent, even prior to the implementation of adequate regulatory measures. Such measures should be sought in cooperation with the Ministry of Transport, the MEPRD and the Latvian Railways. If necessary, public funds should be made available for a limited period of time, if leakage cannot be substantially reduced otherwise.

Recommendation 11.2:
The Ministry of Environmental Protection and Regional Development, the Ministry of Transport and the Latvian Railways should jointly implement, as a project of high priority, a pragmatic scheme to reduce leakage from tank wagons prior to the formal regulation of the issue.

If an adequate solution to leakage of oil in rail transport cannot be found in the near future, the substitution of pipeline for rail transport of oil products should be envisaged to the maximum possible extent. While the possible construction of a new pipeline does not increase the capacity for the transport of oil products, the pipeline existing for this purpose is not yet being used at full capacity. The expansion of pipeline transport is also likely to reduce transport risks, and should be supported by adequate economic instruments, if this is necessary.

Recommendation 11.3:
The full utilization of existing pipeline capacity for the transport of oil products should be encouraged, if necessary with adequate economic instruments.

The actual pollution problems stemming from the transport of oil products by rail are numerous. They are of such a nature that they require urgent solution. Also, all actors involved need to cooperate, as remedial action is required not only with regard to practices, but also with regard to related regulations. For example, combustible wastes from relevant rail transport are more often than not burnt in the open air - a practice that is not illegal for lack of regulation. A similar example requiring joint management concerns the storage of oil-contaminated soils. The third of the top priorities is the excavation of contaminated soils, particularly in those spots where contamination is reaching groundwaters.

The pollution problem should give rise to the creation of a standing committee or other suitable administrative structure, in which the MEPRD, the Ministry of Transport, affected local administrations and enterprises like Latvian Railways cooperate to find commonly acceptable solutions. The forthcoming attitude of both the Ministry of Transport, which has created a unit for environmental protection issues, and the Latvian Railways, which undertook an environmental audit and set up environmental management, is a good starting point for finding cooperative, instrumental working routines in such a structure.

Recommendation 11.4:
An organizational structure should be given the task of finding practicable joint approaches to solving all pollution problems, be it of soil, air or water, created by the transport of oil products by rail. The open-air burning of oil wastes should be discontinued immediately.

The problem posed by soil contaminated with oil is particularly challenging for its magnitude. It concerns both sites contaminated by rail transport and sites contaminated - primarily in the past - by pipeline transport of oil products. The development of proper treatment procedures for the contaminated soil is unavoidable. The plans to recycle more oil wastes and the results of biological treatment tests point in the right direction. The main concern is that implementing satisfactory schemes will take time. The MEPRD should consider all options to help accelerate the preparatory process for proper prevention and recycling or treatment of oil wastes, including contaminated soil.

Recommendation 11.5:
The Ministry of Environmental Protection and Regional Development should consider all possible schemes that could accelerate the introduction of prevention and recycling, as well as treatment, of all hazardous wastes, including oil wastes and contaminated soils.

A final consideration concerns the possible development of a plan for the construction of a new pipeline for the transport of crude oil. Many of its considerations are beyond the scope of this review. However, care should be taken early in the process to recognize the legitimate environmental concerns

over such a project and not cover them up in these wider considerations. The most efficient way of securing this objective would be to associate the environmental administrations, interested NGOs and the general public already with the preparatory discussion of the plan. Such an initiative - primarily to be taken by LatRosTrans and the Ventspils Port Authority - could facilitate the specification of conditions for the eventual building of a new pipeline, and thus improve its chances of finding wider public acceptance.

Recommendation 11.6:
The discussion on the possibility of constructing a new pipeline for the transport of crude oil should involve the relevant environmental institutions, interested NGOs, as well as the general public at the earliest possible time.

Chapter 12

HUMAN HEALTH AND THE ENVIRONMENT

12.1 Status of human health and its monitoring

Latvia had 2 480 000 residents in 1997. Due to a drop in the birth rate and an increase in mortality, the population has been declining since 1991, with the highest natural decrement observed in 1994 and 1995 (0.7 per cent). The age structure of the population is roughly similar to the European average, with 20 per cent below the age of 15 and 13 per cent over 65. Close to 69 per cent of the population lives in urban areas, which is also near the European average.

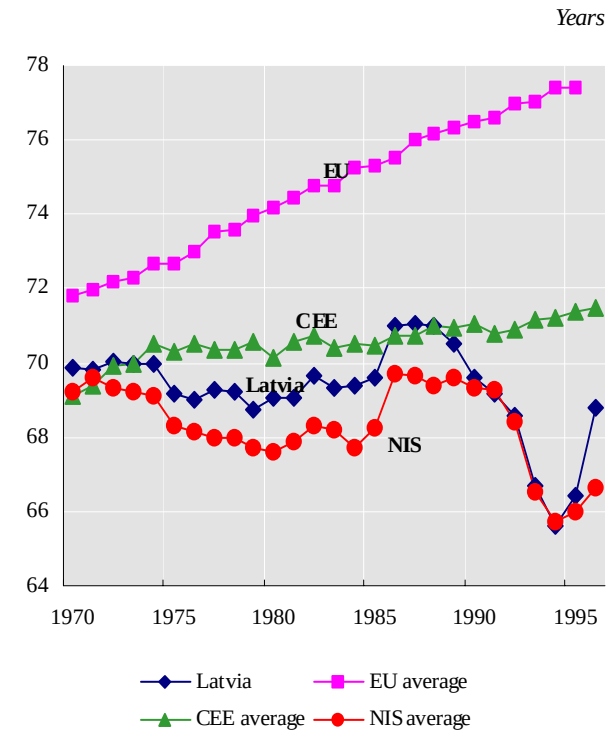
Life expectancy, mortality and morbidity

Life expectancy at birth was 69.3 years in 1996. Over the previous 10 years, dynamic changes in life expectancy could be observed: it declined from about 71 years in 1987-88 to a low of 66.7 years in 1994 (Figure 12.1). Similar temporal variations were seen in life expectancy at various ages, and for both sexes. At its lowest in 1994, life expectancy in Latvia was among the shortest in Europe. In 1996, it was still 8.6 years shorter than in EU countries and 2.6 years shorter than in central and eastern Europe, but already 2.2 years longer than the average in the newly independent States.

Infant mortality was 15.6 per 1 000 live births in 1996, which is 12 per cent higher than in central and eastern Europe and more than 2.3 times the EU average. The 30 per cent increase in the rates in the 1990-92 period was, most likely, related to the introduction of the WHO definition of live birth. There has been no major improvement in the level of infant mortality since 1992; the indicator even recorded a sudden increase (to 18.5) in 1995. The rates of neonatal mortality are relatively high, reflecting more the impact of pre-natal conditions; while post-neonatal mortality, associated more with sanitary conditions, is even lower than in central and eastern Europe.

Diseases of the cardiovascular system are diagnosed as the cause of death in 51 per cent of cases. Mortality related to those diseases in Latvia is among the highest in Europe, both for the population as a whole and for people under 65 years of age. The time trends in the 1990s are very similar to those in the newly independent States, with a peak in mortality in 1994 and a return to the early-1990s level in 1996.

Figure 12.1 : Life expectancy at birth, 1970-1996



Source: WHO/Euro, Health for All database.

Cancers are diagnosed as a cause of 16 per cent of all deaths, with the rates for the total population fluctuating at a stable level around that observed in the EU and 8 per cent lower than in central and eastern Europe. However, the cancer death rates among those aged under 65 are 30 per cent higher than in the EU, and similar to the level in central and eastern Europe or the newly independent States.

Injuries and poisoning are the third most common cause of death (and the second in men under 65 years of age), accounting for 11 per cent of all deaths. Only in the Russian Federation are the mortality rates higher than in Latvia, where the

rates were already 2-3 higher than in central and eastern Europe and 3-4 times higher than in EU in the mid-1990s. By comparison, the Latvian rates exceeded those in central and eastern Europe by some 30 per cent in the mid-1980s. Traffic accidents constitute a smaller proportion of the accidental deaths than in central and eastern Europe or the EU, and have declined by more than 30 per cent since 1990. This decrement in mortality coincides with a programme to improve efficiency in emergency medical services.

Infectious and parasitic diseases account for 1.1 per cent of all deaths, with an increase of more than 50 per cent since the early 1990s, mostly due to tuberculosis. The recorded incidence of (primary) tuberculosis has also increased since 1990, with the rates in 1997 more than twice their 1990 level. This unsatisfactory pattern is similar to that observed in all central and east European countries and newly independent States.

Except for tuberculosis, the rates of the communicable diseases recorded by the mandatory notification system have declined in the 1990s. The most common in this group is viral hepatitis, with rates 8 times higher than in EU and twice as high as in central and eastern Europe, but 80 per cent below the average in the newly independent States.

One particular concern is the endemic situation of tick-borne encephalitis. The incidence (700-1400 cases per year in 1993-97) is well correlated with the spatial density of ticks (*Ixodes persuclatus* and *Ixodes ricinus*). A prevention programme, most likely focusing on vaccination of those at risk, is being developed.

Another disease that is several times more common in Latvia than in other countries is leptospirosis, a bacterial disease spread mostly by contact with rodents. In the last 10 years, close to 900 cases have been recorded, 117 of them fatal. The incidence peaked in the years 1989-93. In 1997, 27 cases (3 fatal) were recorded. To some extent the spread of the disease may be related to inadequate sanitary conditions attracting the rodents (mostly rats) to human settlements, as well as to the higher number of rodents.

System of health status monitoring

The Central Statistical Office collects the basic vital statistical data. The Medical Statistics Bureau of the Ministry of Welfare is responsible for processing and analysing cause-specific data. Starting in 1996, the 10th Revision of the International Classification of Diseases is used, replacing the 9th Revision. More than 80 per cent of causes of death are diagnosed by a medical doctor, and some 35 per cent of deaths occur in hospitals, making it easier to establish a correct diagnosis. Coding of causes of death is verified centrally. However, the proportion of deaths classified as "ill defined conditions" (over 5 per cent) is still 4-5 times higher than in the EU or central and eastern Europe.

Besides the system of mortality registration, the system of notification of infectious diseases and tuberculosis, as well as cancer and mental disease registration, are the sources of data for Latvia's health status monitoring, which is well established and effective. Data from infectious disease registration are analysed by the National Environmental Health Centre and provide the basis for the assessment of trends and patterns of communicable diseases possibly linked to environmental conditions.

It is acknowledged that these data, together with some additional information on the activity of healthcare facilities, give a rather superficial and incomplete picture of the health status of the population. Therefore, in the late 1980s, an ambitious cross-sectional study of the population's health was planned. The study was carried out in 1991, in the middle of Latvia's economic and political upheavals. Due to the timing of the study, the response rate was only 30 per cent, making interpretation of the results rather uncertain. Moreover, no data on environmental factors, except on exposure to environmental tobacco smoke at home and the workplace, were collected. In 1997, the Medical Statistics Bureau prepared a survey of the health status, including information on lifestyles and some socio-economic determinants of health. Only the pilot phase was implemented due to the lack of resources. Again, it is not intended to be used for assessing environmental exposures and their possible health effects.

12.2 Health risks associated with environmental factors

Drinking water

Underground resources of water, from both artesian and deep wells, provide some 70 per cent of drinking water. The remaining 30 per cent is from surface sources and supplied mostly to four cities

(Riga, Daugavpils, Ventspils and Olaine), but the underground water resources near Riga and Olaine are considered sufficient to cover the cities' needs fully. Consequently, protecting the groundwater from pollution should be the major objective of the drinking-water supply systems. Yet, the protection of water catchment areas is considered to be insufficient. The review prepared for the NEHAP quotes several situations where municipal or industrial waste dumps may cause a risk of groundwater contamination. In particular, the municipal landfill in Riga is located on sands that could, potentially, threaten the city's water resources. However, until now, neither industrial nor agricultural contaminants (including pesticides) have been found in artesian water. In a few cases, waste dumps have contaminated deeper layers of groundwater, confirming that the risk exists and may affect the supply of safe drinking water. To eliminate the risk, ecological and health issues should be more *systematically* included in the assessment and planning of waste management processes. A recent example of positive consideration of health issues is the building of storage for old pesticides in Dobele in 1996, where measures to prevent groundwater from being contaminated were improved following recommendations from health experts.

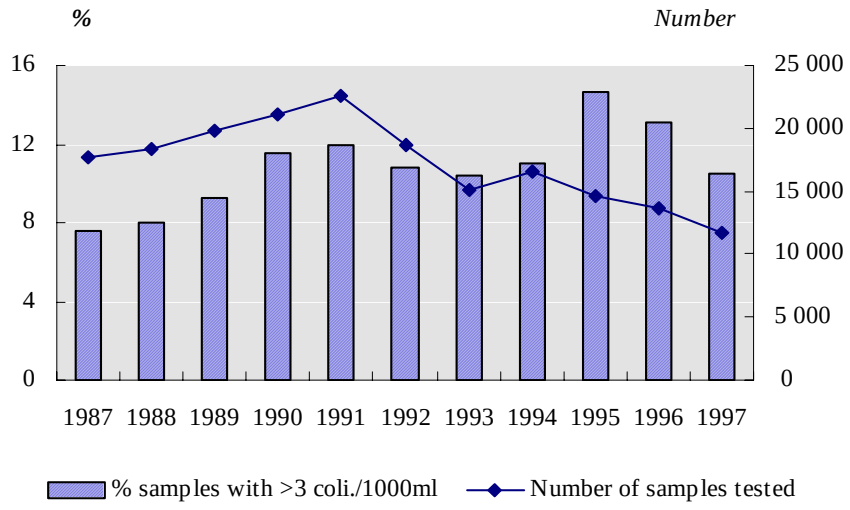
More difficult to protect from contamination are the shallow wells (up to 10-15 m deep, 65 per cent less than 6 m deep), which are a source of drinking water for some 50 per cent of the rural population. Their design and siting rarely follow sanitary rules. This causes a risk of water pollution from sewage or natural fertilizers. In 1996, 36 per cent of water samples from these wells did not meet chemical standards, and 55 per cent did not meet microbiological standards.

Besides a possible contamination at the source, water may be contaminated in the distribution systems. Both poor quality of construction and deterioration of maintenance lead to frequent breakdowns in supply. This is particularly the case of the systems owned formerly by collective farms. While ensuring drinking-water quality is the responsibility of the owner of the network, only few municipal systems have sufficient laboratory capacity for the required monitoring.

Drinking-water quality is monitored by the laboratories of 28 regional centres of the State Department of Environment and Health. Over 17 000 samples a year are tested to check compliance with the norms. At present, the standards developed by the former Soviet Union are used (GOST-2874-82), but new national standards, based on WHO Water Quality Guidelines and EC legislation, are under development.

In 1997, 10.5 per cent of samples from municipal and "departmental" water supply systems, serving 90-95 per cent of the population in big cities and 40-50 per cent in small cities, failed to meet microbiological standards. Over the past three years, this share has decreased (Figure 12.2).

Figure 12.2 : Microbial contamination of drinking water, 1987-1997



Source: National Environmental Health Centre.

However, this may indicate a change in sampling, with fewer tests in the usually more polluted departmental systems. In 1991-96, between 7 per cent and 11 per cent of samples collected from municipal systems failed to meet microbiological standards and the data do not yield a clear trend (up or down). In the systems operated by departments (resoru), the proportion of samples failing to meet microbiological standards is higher, and increasing. In 1996, it reached 22 per cent.

30-35 per cent of the water samples from municipal systems and 40-50 per cent of samples from departmental systems fail to meet chemical standards (based mostly on assessment of turbidity, colour and odour, but also, to a limited extent, on detection of toxic elements in the water).

This failure is mostly due to the water's high iron content. This does not pose a health hazard, although it affects taste and appearance. However, the frequent presence of microbial material in drinking water is a health risk. Though no major outbreak of water-borne disease has been recorded, several hundred cases of hepatitis A and bacterial dysentery are attributed to contaminated drinking water annually.

Air quality

The main sources of air pollution in Latvia are energy production and transport. In the urbanized areas, dispersed heating plants are a major contribution to the population's exposure. Most use solid fuels (coal, wood, peat) and have no emission control equipment. Some 30 per cent of the plants checked in 1995 did not have a sufficiently large sanitary protection zone, i.e. they are built in the proximity of populated areas.

The assessment of ambient air quality is the task of the Latvian Hydrometeorological Agency (LHA). The National Environmental Health Centre controls "high-risk" zones but its resources are not sufficient to collect data to assess the situation. The LHA takes the measurements according to former Soviet methodology and using the standards developed in the former Soviet Union. The precision and detection thresholds of these methods are not sufficient to generate the information that would be necessary to estimate health impacts. In addition to the instrumental problems, the sampling schedule (3-4 times a day, 20-minute sample) makes the interpretation of the measurements uncertain. Therefore, the data collected by the system give only a very rough indication of pollution trends and patterns.

The replacement of the old system with a network of automatic monitors is planned to start in 1998. This is certainly an important step to modernize monitoring methods, though the new methods should be carefully selected and conform with international standards and be cost-effective. Riga City Council has operated one DOAS station since 1994, providing more reliable information on NO_2 and SO_2 concentrations.

According to the Riga City Council's measurements, the annual average NO_2 levels ranged from 43 to 60 µg/m^3 in 1994-97. It is difficult to assess the long-term pollution trends because the monitor has been moved. These levels are comparable with the average values measured in other European cities, although they do exceed the WHO Air Quality Guideline level (40 µg/m^3 for 1-year average). The measurements of the LHA network are higher and reach 90 µg/m^3 in the northern district of Riga. According to the LHA analysis of the trends in 1991-96, NO_2 is the pollutant with the fastest growing concentrations - coinciding with the increase in road traffic.

Ambient concentrations of SO_2 are not high according to both LHA and Riga City Council measurements. The latter are higher and show an annual average concentration of 11-23 µg/m^3 (WHO AQG is 50 µg/m^3 for 1-year average). Only the LHA measures total suspended particulate matter. The concentrations are recorded, and reported, with a precision of up to 100 µg/m^3. Given the recognized health significance of breathable particles, this is a highly inadequate monitoring technique, which does not make it possible to draw any conclusions related to the health risk of the pollution. Based on the presence of the dispersed heating plants mentioned above and average levels of NO_2, one can expect the concentration of particulate matter to be a health concern in Riga and other cities of Latvia.

The NEHAP mentions pollution of ambient air with lead (originating from the combustion of leaded petrol) as a health concern. However, the available information on lead concentrations in Riga (annual averages between 0.02 and 0.15 µg/m^3) and the declining trend also in other cities do not indicate a substantial risk to health from this exposure.

The present housing conditions may be a

significant determinant of public health in Latvia. Insufficiently insulated walls cause loss of energy and excessive heating, increasing ambient air pollution. Moreover, it promotes moisture inside the dwellings, affecting the quality of indoor air. According to the data analysis report prepared for NEHAP, 35 per cent of the urban and 47 per cent of the rural population live in moist and damp dwellings. This leads to the growth of fungi and other biological material, which, in turn, may promote allergic sensitization and other health-related complaints. The accumulation of moisture indicates that building ventilation is poor. Since tobacco smoking is quite common and the percentage of the population living with smokers and, potentially, exposed to environmental tobacco smoke is high (34 per cent of adult women and 15 per cent of adult men), the risk of cardiovascular disease and lung cancer in non-smokers may be increased. The exposure, particularly of children, may have an impact on the incidence of respiratory diseases.

No systematic assessment of indoor air quality is available in Latvia and there are no other activities related to indoor air quality. However, the Ministry of Welfare is involved in the development of a building code, which may be an efficient way to improve indoor air and climate in new buildings. Present regulations related to the (sanitary) quality of building materials are consistent with European Commission regulations (89/106) but the ability to test the materials is limited, due to the lack of adequate equipment and laboratories.

(Hazardous) wastes

As mentioned above, the currently operated waste dumps (over 500) have not been designed with the population's health protection in mind. As a result, waste storage creates a health risk mostly because it may contaminate drinking-water resources. Systems for classifying and handling hazardous wastes are under development. A project to establish hospital waste processing facilities has been proposed and awaits financing.

There are no data on the possible contents of hazardous chemicals in the wastes. Intensive transport of petrochemicals through Latvia and their handling in Ventspils create a potential health risk. It is not clear to what extent the health authorities are prepared for possible emergencies, especially country-wide.

The potential for drinking-water contamination by sewage disposal is also substantial due to ageing networks in the cities and the inappropriate location of facilities (outdoor toilets) in rural settlements. The common detection of microbial contamination in drinking water confirms the risk.

12.3 Framework of environmental health services

Legislation

Human health is not a very prominent issue in the 1991 Law on Environmental Protection, or in many other regulations providing the basis for environmental protection. However, the more recent legislation, e.g. the 1998 Law on Chemical Substances and Chemical Products, aims at preventing and reducing risks to human health as well as to human property and the environment. The Ministry of Welfare plans to prepare a draft law on public health that will link environmental protection and human health objectives more explicitly.

This omission of health issues is especially visible in the application of the Law on State Ecological Expertise of 1990. Also, the new Law on Environmental Impact Assessment does not specify human health impact assessment as one of the objectives (though it can, potentially, be included in the scoping procedure). Adaptation to EU legislation should, in principle, raise the profile of health issues in Latvia's environmental legislation, but the participation of health specialists in the process is limited.

The National Environmental Health Action Plan (NEHAP), drafted in 1995 and signed by the Welfare and Environment Ministers in June 1997, provides a general strategy and good framework for the future legislative and practical consideration of environmental health in the country's policy. The NEHAP has already yielded the following benefits:

- Latvia comprehensively assessed the environmental health situation for the first time when NEHAP was prepared;
- Two sectors of government administration, health and environment, which hitherto had worked separately, merged their objectives and programmes;
- A joint strategy for the determination of specific plans and tasks was formulated.

However, at present, the NEHAP legally binds only the two signatory ministries; the other sectors (economy, transport, agriculture) have no formal obligations.

Institutional arrangements

Environmental health services are included in the administrative structures of the Ministry of Welfare and its Department of Public Health, which was created in January 1997 to succeed the Department of Environmental Health and promote health issues, among other things. This unit supervises the National Environmental Health Centre, which, in turn, operates a system of 10 regional environmental health centres. Independently of the Centre, State Sanitary Inspectorates monitor sanitary conditions and use the (laboratory) services of the centres if necessary. In 1998, the State Sanitary Inspectorate employed 180 staff members and the National Health Centre and Regional Environmental Health Centres employed 1 200. In 1996, they had a budget of some US$ 6 million (which included 2.5 million for vaccination programmes).

An important, urgent task is to complete the system's reorganization, strengthening its professional capacities, expertise and legal tools. The national and regional centres have analytical laboratories assessing chemical and biological contamination of drinking water and their present methodology is State-accredited. However, with the introduction of new standards based on EU directives, the methods and procedures will need to be modified. The planned reorganization includes a consolidation of local units into a limited number of better equipped laboratories in the regional centres.

Transition from the former Soviet water and air quality standards to the new norms based (mainly) on EU directives requires not only a re-definition of concentrations of pollutants in environmental media, but also new pollution control methods and the implementation of the regulations. Regular monitoring will also change. This opportunity should be used to upgrade the capacity of the services to assess health impact and better identify environmental health risks in the country.

At present, Latvia does not have sufficient or sufficiently prepared research and educational institutions to effectively and quickly upgrade the local environmental health capacities. A three-year project, sponsored by the EC TEMPUS programme, is being implemented to restructure the Institute of Labour Medicine of the Medical Academy of Latvia into the Institute of Occupational and Environmental Health (1996-99). However, its focus is on occupational health, related services and specialists, and the impact of the restructuring on environmental health capacities may not be satisfactory.

12.4 Conclusions and recommendations

The data on population exposure to environmental hazards or on conditions that may cause health risks are very limited in Latvia and most of the assessment must be based on very rough and imprecise information. This affects the selection of priorities for action and restricts the ability to evaluate whether the related health management actions are effective.

Recommendation 12.1:
Monitoring of the environment should be improved to make it easier to assess its impact on health, primarily with regard to the most important health risks. Information should be made available so that the situation can be analysed properly.

The existing NEHAP creates a good opportunity to focus environmental health management on selected priorities, and emphasize that health is an important aspect in any assessment of the environmental impacts of present, or planned, economic activities. However, the existing, high-ranking legal documents do not include human health among the objectives of environment protection policies or actions.

Recommendation 12.2:
The protection of public health should figure more prominently in legislation related to both the environment and economic development. The integration should be done in cooperation with all concerned actors. In implementing protective measures related to environmental health, full coordination with the National Environmental Health Action Plan and the National Environmental Action Programme should be the aim.

In the short time since the NEHAP was designed, the weak structures and limited capacities of the environmental health services have not been able to make significant progress in its implementation. This implementation should become a top priority in health management.

Recommendation 12.3:
The existing capacities of the national and regional environmental health centres should be upgraded and modernized. They should intensify their contribution to the National Environmental Health Action Plan's implementation, in particular, in

- *The design of measures preventing environmental health impacts, including impacts from regional or urban planning,*
- *The development of relevant legislation,*
- *The monitoring of human exposure to hazardous environmental factors, focused on the assessment of priorities for the reduction or prevention of health impacts and on the evaluation of the effectiveness of the measures,*
- *The information of the public and raising public awareness.*

Latvia's available expertise needs to be improved and updated. There is practically no research into environmental health that might generate reliable information on the impacts of the environment on health and provide an opportunity for high-level professional training. Foreign experts assist in carrying out selected projects but a better network of local specialists is needed to create a sustainable environmental health system.

Recommendation 12.4:
The training of environmental health specialists should be intensified, including international training for a limited number of specialists and participation in international research projects.

Latvia is well endowed with groundwater resources, which have the potential to cover the country's needs for drinking water. These waters must be protected from contamination. To improve the quality of this water and make it more drinkable, its iron should be removed on a wider scale.

Recommendation 12.5:
Protecting groundwater from contamination should be a high priority in developmental policies and environmental protection. Protective measures should focus on waste storage and treatment as well as on the protection of water catchment areas.

The level of microbial pollution of drinking water remains high in Latvia. This is due both to insufficient water disinfection and to secondary contamination in ageing water distribution systems. The existing data make it the most obvious health risk in Latvia.

Recommendation 12.6:
Water treatment and distribution should be made more effective to reduce the (high) risk of water-borne disease.

The structure of air pollution sources suggests that respirable particulate matter may be the largest health hazard in ambient air in Latvia's cities. However, there is no reliable monitoring of respirable particulate matter (PM10 or PM2.5) and present legislation does not consider this component of air pollution.

Recommendation 12.7:
New legislation should include standards on particulate matter (PM10) and lay down a methodology for PM10 monitoring.

In the planned modernization of the air quality monitoring network, DOAS will be used for continuous monitoring of gases. DOAS is expensive and does not conform to CEN standards.

Recommendation 12.8:
The selection of equipment for the modernized air quality monitoring network should be reconsidered, in view of international standards and the equipment's cost-effectiveness.

ANNEXES

I. Selected environmental and economic data

II. Selected global and regional environmental agreements

Annex I

SELECTED ENVIRONMENTAL AND ECONOMIC DATA

	Latvia
TOTAL AREA (1 000 km^2)	64.6
POPULATION	
Total population, 1997 *(100 000 inh.)*	24.8
- % change (1992-1997)	-7.0
Population density, 1997 *(inh./km^2)*	38.0
GROSS DOMESTIC PRODUCT	
GDP, 1997 *(US$ billion)* (1)	5.53
- % change (1992-1997)	4
per capita, 1997 *(1000US$/cap.)* (2)	2.2
INDUSTRY	
Value added in industry, 1997 *(% of GDP)*	25.6
Industrial output	
- % change (1992-1997)	-56.7
AGRICULTURE	
Value added in agriculture, 1997 *(% of GDP)*	7.4
Agricultural output	
- % change (1992-1997)	-47.5
ENERGY CONSUMPTION	
Total consumption, 1996 *(Mtoe)*	3.78
- % change (1992-1996)	-22.1
Energy intensity 1997 *(toe/US$ 1 000)*	2.0
- % improvement (1992-1997)	+ 13
Structure of energy consumption, 1996 *(%)*	
- Solid fuels	23
- Petrol and its derivates	48
- Gas	19
- Electricity	10
ROAD TRANSPORT	
Road traffic volumes, 1996	
- billion veh.-km	..
- % change (1991-1996)	..
- per capita *(1 000 veh.-km/cap.)*	..
Road vehicle stock, 1998	
- 10 000 vehicles	59.6
- % change (1990-1996)	+ 65
- private cars per capita *(veh./1 000 inh.)1998*	153

Sources: Central Statistical Bureau of Latvia, EIU Country Report and UNECE

	Latvia
LAND	
Total area *(1 000 km²)*	62.0
Major protected areas *(% of total area)*	6.8
Nitrogenous fertilizer use, 1995 *(tonne/km² arable land)* (1)	0.45
FOREST	
Forest area *(% of land area)*	46.1
Use of forest resources *(harvest/growth)*	0.55
Tropical wood imports *(US$/cap.)*	
THREATENED SPECIES	
Mammals *(% of known species)*	23.4
Birds *(% of known species)*	20.9
Fish *(% of known species)* (2)	9.1
WATER	
Water withdrawal *(% of gross annual availability)*	1.0
Fish catches *(% of world catches)*	0.1
Public waste water treatment *(% of population served)1997*	55
AIR (3)	
Emissions of sulphur oxides, 1996 *(kg/cap.)*	18.1
Emissions of sulphur oxides, 1996 *(kg/US$ 1 000 GDP)*	5.13
Emissions of nitrogen oxides, 1996 *(kg/cap.)*	3.49
Emissions of nitrogen oxides, 1996 *(kg/US$ 1 000 GDP)*	0.99
Emissions of carbon dioxide *(tonne/cap.)*	0
Emissions of carbon dioxide *(tonne/US$ 1 000 GDP)*	..
WASTE GENERATED	
Industrial waste *(kg/US$ 1 000 GDP)*	..
Municipal waste *(kg/cap.)*	200
Nuclear waste *(tonne/Mtoe of TPES)*	..
NOISE	..
Population exposed to leq > 65 dB (A) *(million inh.)*	..

(1)Expressed as N (nitrogen).

(2) Freshwater fish.

(3) From stationary sources only, as there was no information on mobile sources in 1996. In 1995, about 9.4 kg Nox/cap were generated from mobile sources.

Annex II

SELECTED BILATERAL AND MULTILATERAL AGREEMENTS

	Worldwide agreements		Latvia
	As of 1 July 1998		
1949	(GENEVA) Convention on Road Traffic	**y**	**R**
1957	(BRUSSELS) Int. Conv. Relating to Limitation of Liability of Owners of Sea-going Ships	**y**	
1958	(GENEVA) Conv. Fishing and Conserv. Living Resources of High Seas	**y**	
1963	(VIENNA) Convention on Civil Liability for Nuclear Damage	**y**	**R**
1969	(BRUSSELS) Intern. Convention on Civil Liability for Oil Pollution Damage	**y**	
	1976 (LONDON) Protocol	**y**	
1969	(BRUSSELS) Conv. Intervention on the High Seas in Case of Oil Pollution Casualties	**y**	
1971	(RAMSAR) Conv.- Wetlands of International Importance	**y**	**R**
	1982 (PARIS) Amendment	**y**	
	1987 (REGINA) Amendments	**y**	
1971	(GENEVA) Conv. on Protection against Hazards from Benzene (ILO 136)	**y**	
1971	(BRUSSELS) Conv. Establishment of an International Fund for Compensation of Oil Pollution Damage	**y**	
1972	(PARIS) Conv. Protection of the World Cultural and Natural Heritage	**y**	
1972	(LONDON) Conv. on the Prevention of Marine Poll. by Dumping of Wastes and other Matter	**y**	
1973	(WASHINGTON) Conv.-International Trade End. Species	**y**	**R**
	1983 (GABORONE) Amendment		
1973	(LONDON) Internat. Conv. for the Prevention of Pollution from Ships (MARPOL)	**y**	
	1978 (LONDON) Protocol (segregated balast)	**y**	
	1978 (LONDON) Annex III on Hazardous Substances	**y**	
	1978 (LONDON) Annex IV on Sewage		
	1978 (LONDON) Annex V on Garbage	**y**	
1974	(GENEVA) Conv. on Prot. against Hazards from Carcinogenic Subst. (ILO 139)	**y**	
1977	(GENEVA) Conv. on Prot. against Hazards from Air Poll., Noise and Vibration (ILO 148)	**y**	
1979	(BONN) Conv.-Conservation Migratory Species of Wild Animals	**y**	
	1991(LONDON) Agr. Conservation of Bats in Europe	**y**	
	1992 (NEW YORK) Agreement ASCOBANS	**y**	
1982	(MONTEGO BAY) Conv. on the Law of the Sea	**y**	
1985	(VIENNA) Conv.-Protection of the Ozone Layer	**y**	**R**
	1987 (MONTREAL) Prot.-Subst. that Deplete the Ozone Layer	**y**	**R**
	1990 (LONDON) Amendment to Protocol	**y**	
	1992 (COPENHAGEN) Amendment to Protocol	**y**	
1986	(VIENNA) Conv. on Early Notification of Nuclear Accidents	**y**	**R**
1986	(VIENNA) Conv. on Assistance in the Case of Nuclear Accident	**y**	**R**
1989	(BASEL) Conv.-Control of Transbound. Movts of Hazard. Wastes	**y**	**R**
1990	(LONDON) Conv. Oil Pollution Preparedness, Response and Cooperation	**y**	
1992	(RIO) Conv.-Biological Diversity	**y**	**R**
1992	(NEW YORK) Framework Conv.-Climate Change	**y**	**R**
1994	(VIENNA) Conv. on Nuclear Safety		
1994	(PARIS) Conv. to Combat Desertification		

Source: UNECE and Latvia/MEPRD

y = in force; **S** = signed; **R** = ratified.

	Regional and subregional agreements		Latvia
	As of 1 July 1998		
1950	(PARIS) Intern. Conv. for the Protection of Birds	**y**	
1957	(GENEVA) European Agreement-Intern. Carriage Dangerous Goods by Road (ADR)	**y**	**R**
1958	(GENEVA) Agreem.-Adoption Uniform Cond. of Approval and Recognition for Motor Vehicles Equipment and Parts	**y**	
1968	(PARIS) European Conv.- Protection of Animals during Intern. Transport	**y**	
	1979 (STRASBOURG) Additional Protocol	**y**	
1969	(LONDON) European Conv. -Protection of Archeological Heritage	**y**	
1973	(GDANSK) Conv.- Fishing and Conserv.of Living Resources in Baltic Sea and Belts	**y**	
	1982 (WARSAW) Amendments	**y**	
1974	(HELSINKI) Conv.Prot. Marine Env. Baltic Sea	**y**	**R**
1976	(BARCELONA) Conv. Prot. Mediterranean Sea against Pollution	**y**	
	1976 (BARCELONA) Prot. Dumping	**y**	
	1976 (BARCELONA) Prot. Co-operation in Case of Emergency	**y**	
	1980 (ATHENS) Prot. Land-based Sources Pollution	**y**	
	1982 (GENEVA) Prot. Spec. Protected Areas	**y**	
	1994 (MADRID) Prot. against poll. from exploration/exploitation		
1979	(BERN) Conv.-Conservation European Wildlife & Natural Habitats	**y**	**R**
1979	(GENEVA) Conv.-Long Range Transboundary Air Pollution	**y**	**R**
	1984 (GENEVA) Prot.-Financing of Co-op Programme (EMEP)	**y**	**R**
	1985 (HELSINKI) Prot.-Reduction of Sulphur Emissions by 30%	**y**	
	1988 (SOFIA) Prot.-Control of Emissions of Nitrogen Oxides	**y**	
	1991 (GENEVA) Prot.-Volatile Organic Compounds	**y**	
	1994 (OSLO) Prot.-Further Reduction of Sulphur Emissions		
	1998 (AARHUS) Prot.-on Persistent Organic Pollutants		**S**
	1998 (AARHUS) Prot.-on Heavy Metals		**S**
1991	(ESPOO) Conv. Env. Impact Ass. in a Transboundary Context	**y**	
1992	(HELSINKI) Conv. Protection and Use of Transboundary Waters and Intern. Lakes	**y**	**R**
1992	(HELSINKI) Conv. Transboundary Effects of Industrial Accidents		**S**
1992	(HELSINKI) Conv. Protection Marine Env. Baltic Sea (2nd)		
1992	(BUCHAREST) Conv. Protection Black Sea Against Pollution	**y**	
1992	(PARIS) Conv. Protection Marine Env. North-East Atlantic		
1993	(LUGANO) Conv.- Civil Liability for Damage from Activities Dangerous for the Environment		
1994	(LISBON) Energy Charter Treaty		
	1994 (LISBON) Prot. on Energy Efficiency and Related Aspects		
1998	(AARHUS) Conv. On Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters		**S**

Source: UNECE and Latvia/MEPRD

y = in force; **S** = signed; **R** = ratified.

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