**OVERVIEW**
**NATIONAL RESEARCH LANDSCAPE (NRL)**


## General information about the country

The Republic of Macedonia (RM) is located in Southeast Europe, bordering Albania, Bulgaria, Greece and the Federal Republic of Yugoslavia. The total area of the REPUBLIC OF MACEDONIA is 25,333 sq. km, out of which land occupies to 24,856 sq. km, and water to 477 sq. km. The distance between its farthest points is 160km from North to South and 215 from East to West.

The influence of two types of climate are predominant: the Mediterranean and the Continental.

Macedonia is predominantly a mountainous country. There are 34 peaks rising over 2,000 meters above sea level, the highest one Korab (2,764m). Between the mountains and mountain ranges there are many valleys and plains noted for their ecological agricultural production: young vegetables, industrial crops, cereals, grapes, fruit etc.

The climatic conditions and cultural heritage offer favorable conditions for the development of tourism. The city of Ohrid with its magnificent lake,is an outstanding tourist center. Its world famous for its unique flora and fauna (Ohrid trout and belvica). The original architecture, early medieval churches and monastaires, the ancient fortress and a unique treasury of icons and frescoes place this town among the UNESCO protected treasures.

Macedonia is a country with ancient tradition with numerous archeological sites.

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## POPULATION

According to the census 2002 the Republic of Macedonia has a population of 2.038.059.

### 1.1. Population by years (1990-2002)

Population by ethnic groups (n° and %):

census 1994

| Ethnic group | n° | % |
|---|---|---|
| Macedonian | 1295964 | 66.6% |
| Albanian | 441104 | 22.7% |
| Vlach | 8601 | 0.4% |
| Roma | 43707 | 2.2% |
| Turkish | 78019 | 4.0% |
| Serbian | 40228 | 2.1% |
| Other | 36427 | 1.9% |
| Not declareted | 1882 | 0.1% |
| **Total** | 1945932 | **100%** |

census 2002

| Ethnic group | n° | % |
|---|---|---|
| Macedonian | 1297981 | 64.18 |
| Albanian | 509083 | 25.17 |
| Vlach | 9695 | 0.48 |
| Roma | 53879 | 2.66 |
| Turkish | 77959 | 3.85 |
| Serbian | 35939 | 1.78 |
| Other | 38011 | 1.88 |
| Not declareted | 0 | 0 |
| **Total** | 2022547 | **100.00** |

Source :State Statistical office

**Political Structure**

Under the 1991 Constitution the legislative power rests in the unicameral Assembly ("Parlament"), which consists of 120 seats. All members of the Parlament are elected proportionally within the six election units. All members serve four-year terms.

The executive power is represented by the President and by the Prime Minister. The President (the head of state) is elected by popular vote for a five-year term and the Prime Minister is elected by the Assembly. The Prime Minister heads the Council of Ministers, elected by a majority vote of all deputies in the Assembly.

The Supreme Court, the Constitutional Court and the Republican Judicial Council represent the judicial branch. Judges for all these bodies are elected by the Parliament.

The capital and largest city, Skopje is political, cultural and economical center.

## 1.2. GDP

| Year | In billion | Currency |
|---|---|---|
| 1997 | 3.3 | EURO |
| 1998 | 3.2 | EURO |
| 1999 | 3.4 | EURO |
| 2000 | 3.9 | EURO |
| 2001 | 3.8 | EURO |
| 2002 | 4.0 | EURO |
| 2003 | 4.1 | EURO |

Source :State Statistical office

## 1.3. Economic system: sectors (industrial, agricultural,...), figures

Currently Macedonian GDP amounts to 4.1 billion Euros (2004 estimates). The GDP is expected to grow by 3 % in 2005, with moderate inflation of 1 % and a fiscal deficit of 1.6 %. The GDP per capita was 1 830 $ in 2001. The GDP composition by sector is the following: agriculture - 10%, industry - 25%, services - 65% (2002 estimates). The external debt was estimated in 2002 to some 1.5 billion $. The national currency is the Macedonian Denar (MKD). The number of employees in various sectors is given in the table below.

| | | Employed |
|---|---|---|
| Agriculture, hunting and forestry | A | 100528 |
| Fishing | B | 496 |
| Minerals and stone mining | C | 2809 |
| Manufacturing | D | 116849 |
| Electricity, gas and water supply | E | 16627 |
| Construction | F | 38620 |
| Wholesale and retail, repair of motor vehicles, motorcycles and articles for personal use and for households | G | 70296 |
| Hotels and restaurants | H | 13187 |
| Transport, storage and communications | I | 31134 |
| Financial intermediation | J | 6157 |
| Real estate, renting and business activities | K | 11452 |

| | | |
|---|---|---|
| Public administration and defence, compulsory social security | L | 39198 |
| Education | M | 31524 |
| Health and social affairs | N | 32518 |
| Other activities of communal, cultural, general and personal services | O | 19720 |
| Private households with employees | P | 146 |
| Exteritorial organisations and bodies | Q | 948 |

## SCIENTIFIC POLICY

In accordance with Article 47 of the Constitution of the Republic of Macedonia, the state is committed to fostering and supporting scientific research, as well as technological development. In accordance with Article 23 of the Law on Organisation and Operation of the State Administrative Bodies ("Official Gazette of the Republic of Macedonia" No. 58/00), the Ministry of Education and Science is responsible for the organisation, finance, development and promotion of science and technological development, state-of-the-art communication technologies, information science and technology, as well as international cooperation regarding these issues.

Pursuant to Article 6 of the Law on the Scientific Research Activity ("Official Gazette of the Republic of Macedonia" Nos.13/96 and 29/02), the fundamental principles of the scientific research activities are inviolability and protection of human dignity. They, in turn, are based on the following criteria: freedom of scientific and scholarly creative work, autonomy and implementation of the findings, diversity of scientific views and methods, as well as international cooperation.

Article 7 of the Law on the Scientific Research Activity ("Official Gazette of the Republic of Macedonia" Nos. 13/96 and 29/02) contains a clear definition of the public interest related to the scientific research in the domain of the national and cultural identity of the Macedonian people and other ethnic communities within the Republic of Macedonia. Furthermore, research is underlined as a basic prerequisite for the overall development of the state. The research activities carried out in order to raise the level of research excellence and creativity and the transfer of world-class knowledge, including the domain of defence and security, are also determined by this Law.The promotion of human resources and research infrastructure are also issues of public interest.

The objectives of the Law on Stimulation and Facilitation of the Technological Development ("Official Gazette of the Republic of Macedonia" No. 98/00) are to foster and support the technological development at a national level, and to programme and fund these activities. The technological development as defined by this Law comprises:

development of national technologies;
substantial progress of the country based on an independent economic basis;
deployment of new technologies within the production facilities;
establishment of innovation and technology centres;
development of the necessary technological infrastructure, transfer of knowledge through a continuous upgrading of adequate skills.

## * Priority tasks

In accordance with the structure of economy and the institutional infrastructure in the domain of science, the Ministry of Education and Science has set the following priorities regarding the science and technology development of the Republic of Macedonia:

sustainable growth,
biotechnology,
high-quality food production,
water resources management,
energy sector,
new materials,
environmental protection,
information and communication technologies,
healthcare, and
geological science and engineering.

In the forthcoming period, the infrastructure support to scientific research will focus on the following:

- further development of the academic research network;
- renovation of the research equipment;
- stimulation of promoting new research and development units within the economy;
- systematic and continuous supply of foreign reference literature;
- upgrading the library information system;
- strengthening the present technology development capacities;
- founding new technology transfer centres in view of a more efficient integration of the research and business entities;
- providing favourable working conditions for those research entities that operate in unacceptable conditions.

The imperatives of the research and development policy of the Republic of Macedonia in the near future will be:

- enhancement of the application and transfer of knowledge relevant for the economic, social, cultural and environmental development of the Republic of Macedonia;
- stimulation and promotion of international cooperation and the transfer of knowledge and technology from abroad;
- introduction of the performance monitoring and evaluation system regarding the quality of results achieved by the science and technology research teams through the implementation of international standards and criteria;
- increased investments in science and development activities;
- facilitating the access to the international funds and providing technical assistance ;
- Defining and introducing of interdisciplinary programmes for target research activities;
- establishing internationally standardised measures for the evaluation and assessment of the economic relevance of the research results as defining criteria for further development policy;
- providing incentives for the enterprises in establishing effective knowledge and technology transfer units;

- reducing the technology gap with the aim to reach the level of development of the developed countries;
- creating the conditions for raising the quality of knowledge and innovations;
- establishing a technology information system as part of the information system that is commensurate with the criteria of the corresponding data bases, services and networks;
- setting a model of a single infrastructure for the support and the development of science and technology;
- consolidation and promotion of the national industry and companies, especially the support to small and medium enterprises, in order to ensure the quality and competitiveness of their products on the global market;
- setting a system of priorities, supported by economic policy measures.

The science policy focuses on the following target entities:
- institutions of higher education;
- the Macedonian Academy of Sciences and Arts;
- public scientific and research institutions;
- technology transfer entities; and
- Research and development entities of the industry.

## Instruments

The Ministry of Education and Science has at its disposal the following financial instruments for the support of scientific research:
- financing the national research and technology development projects;
- awarding scholarships for post-graduate and doctoral studies at local and foreign universities;
- financial support for research workers participating at international conferences;
- financial support in organising international scientific conferences;
- contribution for publishing scientific and research publications;
- development of the research and technology development infrastructure.

Due to the unfavourable situation in the industry, the resources for the research and technology development activities are mainly allocated from the Budget of the Republic of Macedonia. Thus, there is an urgent need to impose a more active role upon the business sector that, in turn, will be encouraged to invest in its own development via innovations, new products and new technology lines.

The Macedonian science will strengthen its competitiveness at an international level only if the scientific research entities are adequately supported in terms of personnel and technical equipment. Due to its limited capacities, the Ministry of Education and Science is about to organise an international donation conference on science and technology development. The funds raised by this conference will be allocated for the reconstruction of the science infrastructure.

With reference to the revision and evaluation process of the scientific research activity, it should be noted that the existing system has to be improved. Namely, the selection of projects is carried out institutionally on the basis of a public competition followed by an anonymous review. After the completion of projects, their findings are presented to the competent scientific public. The main goal of this system is to achieve desetatisation of the process of expert evaluation of the science and research activity.

The traditional evaluation system has to be upgraded with the solutions laid down in the new Law on Scientific Research and Technological Development. For that purpose, the Law has foreseen the establishment of a network of national coordinators for different domains and disciplines in order to achieve objective

evaluation procedures. Moreover, for projects of a broader public interest, international expertise has been provided for, so as to avoid the conflict of interests among the scientists and scholars.

2.1 Expenditure of R&D as share in GDP – compared by years (observed period 1996 – 2003)

| | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|
| GERD (Gross Domestic Expenditure on R&D) / GDP | 0.38 | 0.43 | 0.35 | 0.44 | 0.32 | 0.26 | 0.22 |

2.2 Share of R&D expenditure in GDP by sector – compared by years (observed period for all indicators 1996 – 2003)
Sectors: business enterprise expenditure on R&D

| | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|
| Business enterprise expenditure on R&D/GDP | 0.05 | 0.05 | 0.04 | 0.03 | 0.02 | 0.01 | 0.003 |

Source :State Statistical office

government expenditure on R&D

| | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|
| Government expenditure on R&D/GDP | 0.18 | 0.15 | 0.16 | 0.15 | 0.16 | 0.15 | 0.14 |

Source :State Statistical office

Higher education expenditure on R&D

| | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|
| Higher education on R&D/GDP | 0.15 | 0.23 | 0.14 | 0.27 | 0.13 | 0.11 | 0.08 |

Source :State Statistical office

private non-profit expenditure on R&D
**not available**

2.3 Government / ministry budget for science

in EURO

| | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|
| Science and Research | 3327869 | 3393443 | 2754098 | 1754098 | 2786885 | 2573770 | 2393443 | 1147541 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Technological development | 65574 | 81967 | 81967 | 81967 | 163934 | 8197 | 196721 | 83672 |
| Technical culture | 231148 | 196721 | 196721 | 196721 | 196721 | 131148 | 163934 | 114754 |
| Total | 3624590 | 3672131 | 3032787 | 2032787 | 3147541 | 2713115 | 2754098 | 1345967 |

2.4 Human resources: R&D personnel (by scientific fields and institutions – higher education institutions, national research institutions, private sector)

## Research and Development personnel

| | **1997** | **1998** | **1999** | **2000** | **2001** | **2002** | **2003** |
|---|---|---|---|---|---|---|---|
| Business enterprise | 370 | 361 | 306 | 241 | 203 | 100 | 67 |
| Government sector | 916 | 957 | 1022 | 1044 | 809 | 820 | 829 |
| Higher education | 1650 | 1957 | 1840 | 1809 | 1897 | 1949 | 1693 |
| **Total** | **2936** | **3275** | **3168** | **3094** | **2909** | **2869** | **2589** |

Source: State Statistical office

## Number of Researchers

| **Year** | **1998** | **1999** | **2000** | **2001** | **2002** | **2003** |
|---|---|---|---|---|---|---|
| Total | 3275 | 3168 | 3094 | 2909 | 2869 | 2589 |
| FTE | 1892 | 1838 | 1786 | 1630 | 1519 | 1464 |
| FTE per 1000 Labour Force | 2.3 | 2.3 | 2.2 | 1.9 | 1.8 | 1.7 |

Source :State Statistical office