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Moldova
COUNTRY
Moldova

# Country Indicators

**Population**: 3.6 million (2009)

**GDP per capita**: 1230 (2010)

**R & D intensity(GERD/GDP)**: 0.53 (2009)

**Share of private sector R&D**: n/a (2011)

**Share of public sector R&D**: n/a (2011)

# Basic Characterisation of Research system

When discussing the R&D and innovation system of the Republic of Moldova, it has to be taken into consideration that the country is split into a main territory controlled by the Moldovan Government
and the much smaller breakaway region Transnistria. The Republic of Moldova has an overall population of slightly more than 4 million; 3.6 million of the population live in the area controlled by the government and slightly more than half a million live in Transnistria (including Bender). The latter area is governed by a separate local administration. Data and information in this country fiche refer to Moldova without Transnistria. As far as available, information on the breakaway region has been added in the respective sub-chapters.
Moldovaâ##s R&D and innovation system is rather centralised, with the Moldovan Academy of Sciences (ASM)
taking the central position. It is at the same time the main policy-making institution, the main R&D and innovation funding organisation, the main research organisation and has in addition a higher education institution attached to it.
Gross Domestic Expenditure on R&D (GERD) according to data of ASM reached in the Republic of Moldova in 2009 an amount of Moldovan Lei 351.3 million (â#¬22m), which was as a share of GDP a moderate 0.59%. Until 2008 GERD was steadily rising and had reached in absolute figures â#¬24.3m. R&D funding is overwhelmingly provided by governmental sources, although no exact data on the business-enterprise sector are available.

**Key R&D figures:**

| | 2006 | 2007 | 2008 | 2009 | EU-27, 2009 |
|---|---|---|---|---|---|
| **Real GDP growth rate[1]** | 4.8 | 3.1 | 7.8 | -6.5 | -4.2 |
| **GERD as % of GDP (R&D intensity)** | 0.46 | 0.65 | 0.6 | 0.59 | 2.01 |
| **GERD per capita in Euro** | 3.4 | 5.2 | 6.8 | 6.1 | 473.9 |
| **Total civil R&D appropriations (GBAORD) in million Euro** | 11.1 | 17.7 | 22.9 | 19.9 | 80,306 |
| **Total R&D appropriations in % of GDP (GBAORD as % of GDP)** | | | | | 0.75 |
| **BERD in million Euro** | | | | | 146,936.684 |
| **BERD as % of GDP (Business sector R&D intensity)** | | | | | 1.25 |
| **GERD funded by abroad as % of GERD** [2] | 2.6 | 2.7 | 3.7 | 6.5 | 8.7 |
| **HERD as % of GERD (R&D performed by HEIs as % of GERD)** | 10.2 | 11.1 | 12.0 | 11.6 | 23.7 |
| **GOVERD as % of GERD (R&D performed by PROs as % of GERD)** | 74 | 73.4 | 73.9 | 77.1 | 13.2 |

| | | | | | |
|---|---|---|---|---|---|
| **BERD as % of GERD (R&D performed by Business sector as % of GERD)** | 15.8 | 15.5 | 14.1 | 11.3 | 62.0 |
| **Doctorate graduates (ISCED 6) per 1,000 population aged 25-34** | | | | | 1.5 |
| **Share of the population aged 30-34 having completed tertiary education** | | | | | 32.3 |
| **Employment in Knowledge-intensive service sectors as share of total employment** [3] | | | | | 32.96 |
| **HRST as a share of total labour force (EUROSTAT)** | | | | | 40.1 |

For data sources and data quality see chapter *Funding flows*

Most of public R&D funding â## some 80% â## is allocated as block funding/institutional funding, while competitive funding makes roughly 15%. The rest is allocated through other funding modes. Competitive funding has to a large extent only been introduced over the last ten years; it is still moderate, but its share shows an upward trend. Only research organisations accredited with the National Council for Accreditation and Attestation

(CNAA) have access to governmental R&D funding in Moldova. Private companies are not accredited, and are therefore not eligible for receiving funding through governmental R&D programmes.

Most of R&D (77.1% in 2009) is performed in the governmental sector (institutes of ASM and branch institutes of ministries), while the business enterprise and higher education sectors perform significantly less (11.3% and 11.6% respectively in 2009).

Recent trends show a strengthening of the role of R&D in higher education institutions, improvements of the innovation infrastructure (e.g. via recently established technoparks) and measures to enhance business R&D.

In Transnistria a rather limited R&D potential is given due to the size of the region. Its R&D policy is shaped by a Supreme Advisory Council on Science and Technology. Policy is determined then by the head of the local administration. The department of education takes care of policy implementation. Approximately â#¬0.95m (13.4m Transnistrian Roubles) was spent in 2009 by the local administration on R&D, which was equivalent to 0.8% of its budgetary expenditure. Most R&D in Transnistria is performed in its higher education institution.

[1]

Indicators for Moldova: World Bank

[2]

For EU-27, data for 2008

[3]

For EU-27, data for 2007

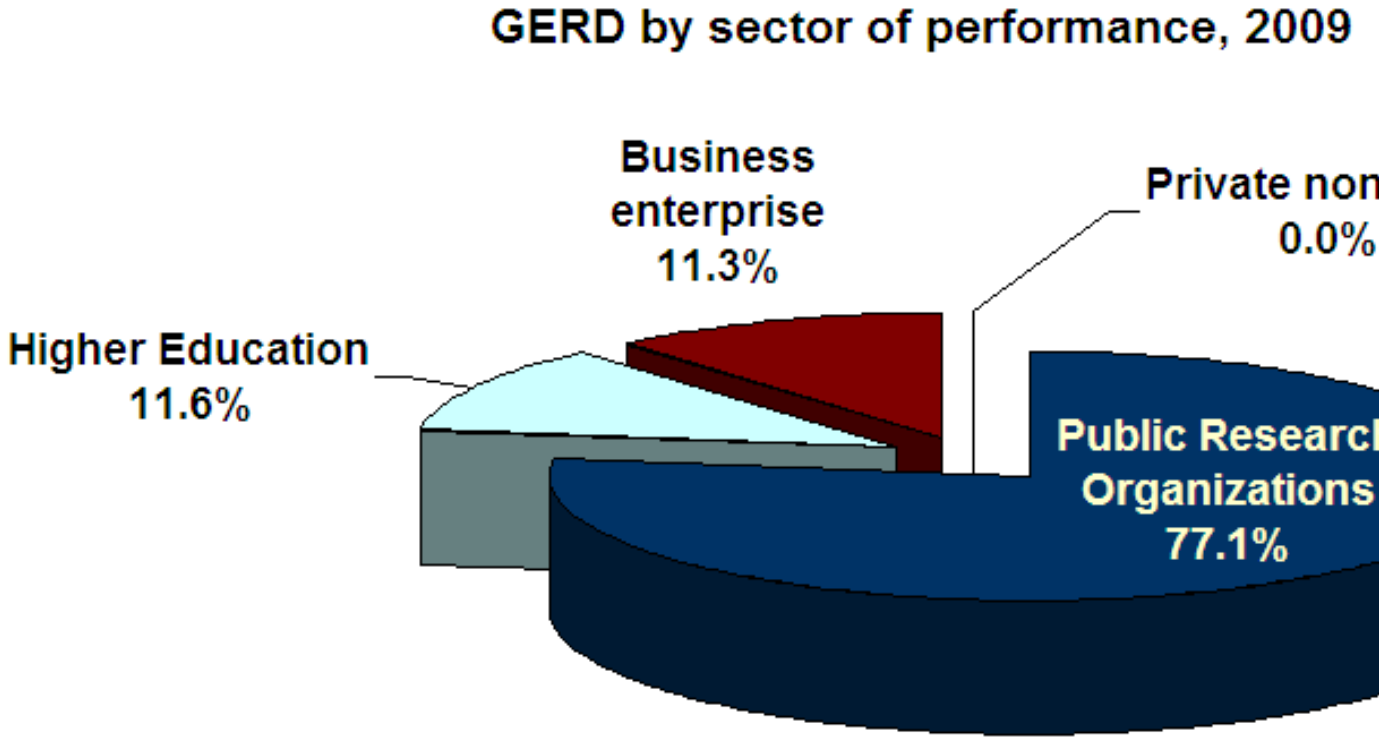
# Funding Flows

***GERD by R&D performers***

| | ***PRO*** | ***Business enterprise*** | ***Higher Education*** |
|---|---|---|---|
| 2006 | *74%* | *15.8%* | *10.2%* |
| 2007 | *73.4%* | *15.5%* | *11.1%* |
| 2008 | *73.9%* | *14.1%* | *12.0%* |
| 2009 | *77.1%* | *11.3%* | *11.6%* |

***Source:***

UNESCO




For Moldova only fragmented data on R&D funding and on performance of R&D are available. The figures rely mostly on data from annual reports of the Moldovan Academy of Sciences (ASM)
. These data include all expenditure of research organisations accredited with the Moldovan National Council for Accreditation and Attestation, and which receive funding from the state budget. Data do not include R&D expenditure from general university funds and cover only a rather limited share of private R&D funding (only co-funding of private business in innovation and technology transfer projects supported by the Agency for Innovation and Technology Transfer â## AITT is considered). Gross Domestic Expenditure on R&D (GERD) does therefore not give the whole picture of R&D funding and is underestimated. GBAORD data are indicated according to reports of the Ministry of Finance on budget implementation. The figures do not include R&D funding in Moldovaâ##s breakaway region Transnistria.
Gross Domestic Expenditure on R&D (GERD) was on the rise in Moldova until 2008, when it reached â#¬ 24.3m and 0.6% of GDP. Policy makers had foreseen to increase R&D expenditure steadily and to achieve a level of 1% GBAORD as a share of GDP by 2008 or 2009. The target was missed in 2008 and due to the international economic crisis, Moldova had to cut back on expenditure. As a result GERD decreased in 2009 reaching an amount of â#¬22m. GERD as a share of GDP was hence equivalent to 0.59%, which is substantially lower than in EU countries. The budgetary cuts can be illustrated with the planned budgetary expenditures for R&D in

2009: the government had approved â#¬30.3m for R&D activities, but allocated only â#¬19.9m (Report of the Ministry of Finance on implementation of the state budget in 2009
).
R&D funding is dominated by the government sector. R&D funding by business enterprise and higher education institutions can be estimated as being rather low. But no data are available. Funding from abroad was according to data of the UNESCO Institute of Statistics (UIS) reaching 6.5% of GERD in 2009. R&D funding from private non-profit organisations is insignificant to non-existent.
For sectors of performance of R&D, data of UIS show for 2009 that in Moldova the overwhelming share of R&D was performed in the governmental sector (77.1%) and that this share was even increasing in the economic crisis at the expense of the business enterprise sector. The business enterprise sector performed 11.3% and herewith even less than the higher education sector with 11.6%, whereby the latter one shows in general an upward trend over the last years. The private non-profit sector is insignificant in R&D performance too.
R&D funding in Transnistria has to be considered in addition to the figures presented above. In Transnistria, governmental R&D funding by the local administration was provided in 2009 in the amount of about â#¬0.95m (13.4 million Transnistrian Roubles) or 0.8% of the budget expenditures of the region. More than half the budget is used for R&D performed by the 50% in the governmental sector (few public research organisations) and around 40% in the local higher education institution.

# Structure of the research system

Moldovaâ##s R&D and innovation system is rather centralised, with the Moldovan Academy of Sciences (ASM)
being the key player. It is the main policy-making institution and fulfils the role of a ministry of science. The president of ASM is a member of the government. The Moldovan Government approves the R&D budget and the Moldovan Parliament approves laws for R&D and innovation.
The academy is also the main policy implementation body; nearly all public R&D and innovation funding programmes are managed by the academy through its executive body, the Supreme Council for Science and Technological Development (SCSTD)
, or its subordinated agency, the Agency for Innovation and Technology Transfer (AITT). The academy is with its 19 research institutes also the main research organisation in the country. To the group of public research performers belongs also branch research institutes subordinated to certain ministries.
The 30 higher education institutions in the country are another group of research performers, but not all are performing R&D. Finally, the business enterprise sector performs R&D, but its activities are not well reflected in statistics.
The National Council for Accreditation and Attestation
(CNAA) has an important role since it accredits research organisations in Moldova. Only accredited organisations are eligible for public R&D funding.
In Transnistria, a Supreme Advisory Council on Science and Technology takes care of R&D strategy formulation and definition of priorities. The head of the local administration subsequently determines the research policy, which is being implemented by the department for education. The regional legislature approves legal acts for R&D.

# Highlights

Moldova aims at association to the FP7 by end 2011

# Recent Research Policy Developments

**Effects of parliamentary elections 2010 on R&D policy**
Following early parliamentary elections in November 2010, a coalition government
under the heading Alliance for European Integration II (AEI-II) took office in January 2011. The coalition, led by Prime Minister Vlad Filat, comprises the Liberal Democratic Party (PLDM), Democratic Party (PD) and the Liberal Party (PL). The government structure has not undergone many changes compared to the previous one. Importantly for R&D policy, the President of the Academy of Sciences (ASM), Gheorghe Duca, has been confirmed as a member of the government. The Parliament will have to approve the budget, including the governmental expenditure on R&D, and it will have to develop and approve a new Code on Education which may affect the whole national R&D system.
The Government Programme
for the period 2011-2014 is entitled "European Integration: Freedom, Democracy, Welfareâ## and aims at stimulating innovation and competitiveness as a basis of the economy. Two chapters of the programme, on higher education and research, and on competitiveness policies and development of small and medium sized enterprises deal with issues of science, research, technology, and innovation. Major changes of the R&D and innovation system are foreseen, including a decentralisation of R&D funding and a strengthening of research in higher education institutions. (For more details see chapter *Research Policy Goals*).
**Moldova aims at association to the FP7 still in 2011**

Moldova has requested in 2008 the association to the EUâ##s 7th
Framework Programme for RTD (FP7). Negotiations were launched in January 2010 and this process is ongoing. To make forward with Moldovaâ##s aspirations for EU integration, an Action Plan for the Republic of Moldova â## Priorities for Reform in European integration was approved by the Governmental Committee for European Integration in October 2010 including the association to FP7. On 30 September 2010 an Additional Protocol to the EU-Moldova Partnership and Cooperation Agreement was signed, which deals with the participation in Community Programmes. The protocol was approved by Government Decision no.30
of 20.01.2011, which allows for the initiation of formal association negotiations. The Moldovan Government aims at completing the FP7 association process still in 2011, with a view to the country becoming associated to FP7 from 1 January 2012.

# Research Policy Goals

The basic law Code on Science and Innovation
approved in 2004 stipulates some general goals of R&D and innovation: research policy and usage of the scientific-technological potential of the country shall contribute to a stable socio-economic and human development (article 56). The scientific-technological potential shall be used for commercialisation and production of competitive goods. Fundamental and applied research shall be integrated with innovation activities, linkages between education and science shall be consolidated, and resources shall be concentrated on strategic directions of science and innovation (article 58).
The Partnership Agreement
(2009-2012) between the Academy of Sciences (ASM) and the Moldovan Government is the central document regulating the relationship, tasks and budget between the government and the academy. In the agreement general policy goals were taken up again and complemented with some more refined objectives (articles 10 & 8). These include strengthening the infrastructure of science and innovation (e.g. through establishing the Technopark InAgro), improving competitive R&D funding, stimulating the creation of small and medium sized enterprises, attracting direct investments in science and innovation and expanding technology transfer.
The Moldovan Government, which took office in January 2011, has envisaged in its Government Programme
important reforms of the R&D and innovation system. The legal and institutional framework for R&D and innovation shall be improved to bring it to European standards. Modifications of the Code on Science and Innovation and the approval of a new Code on Education may be expected in this respect. And institutionally it is considered to establish two new agencies, a National Agency for Research, Innovation and Technology Transfer, with functions to promote research and innovation policies, and a National Agency for Quality Evaluation of Higher Education and Research, with functions of monitoring and external quality assessment in higher education and research.
Research in higher education institutions, as well as the interaction of research with business shall be strengthened. Cooperation with foreign partners, including large multinational companies shall be enhanced in order to get access to advanced research and high technology. Governmental R&D funding shall be decentralised and opened to all R&D and innovative organisations, beyond the currently accredited research organisations. The research fields energy and natural resources have been singled out for specific stimulation with funding instruments. Programmes to promote young researchers and for encouraging the repatriation of the Moldovan scientific diaspora shall be implemented.
As of 2004 (with the Code on Science and Innovation
), policy makers had foreseen to increase R&D expenditure steadily and to reach a level of 1% GBAORD as a share of GDP by 2008 or 2009. This target was softened later and reads now â##up to 1%â##. In the partnership agreement between the government and the ASM, a 1% target was foreseen for 2011, but as a result of an amendment it is now fixed annually (at a lower level). GERD as a share of GDP increased indeed up to 0.65% in 2007, but declined as a result of the economic crisis to 0.59% in 2009.

## Thematic R&D priorities

Thematic priorities for research and innovation activities in Moldova are listed in the Partnership Agreement
between the Academy of Sciences (ASM) and the Moldovan Government (article 4) and are valid for the period 2006-2013. The priorities are:

- enhancing the rule of law, and highlighting the value of the cultural and historical heritage in the context of European integration;
- human, natural and information resources for sustainable development;
- biomedicine, pharmaceuticals and health/medicine;
- agricultural biotechnology, soil fertility and food security;
- nanotechnology, industrial engineering, new materials and products;
- enhancing the efficiency of the energy sector and securing energy supply, including renewable energy resources.

In 2008, the GBAORD was allocated to these priorities as follows: priority 1 â## 9.9%, 2 â## 21.8%, 3 â## 16.2%, 4 â## 26.3%, 5 â## 22.5%, 6 â## 3.3% (source: Official Monitor, special edition, June 27, 2008).
In spite of these thematic priorities, most measures of R&D policy in the Republic of Moldova are generic ones and the procedures are identical for funding instruments, evaluation, monitoring, and reporting for all thematic priorities. It is above all the main competitive funding scheme, the State Programmes for R&D

, which is thematically focused. But the topics in the programmes are kept rather broad.
Thematic priorities are defined mainly by the ASM. Other ministries have a minor role; they are involved in topic formulation of State Programmes for R&D, which are related to their responsibilities. (See also section *Other policies* under the chapter *Policy Mix*).

## Sectoral policies

Policies for stimulating business R&D and public-private R&D cooperation have been introduced in Moldova only in recent years. They are still weakly developed, although the missing link between science and industry is recognised as one of the key problems of the national R&D system.
Tools for stimulating public-private cooperation are on the one hand the Agency for Innovation and Technology Transfer (AITT) and its support schemes, especially the funding programme Innovation and Technology Transfer Projects. On the other hand these tools are recently established technoparks, one innovation incubator and related fiscal incentives. (See also chapters *Fiscal Policies* and *Interaction between Knowledge Triangle Policies*

# Main Policy Documents

Code of the Republic of Moldova on science and innovation
National Development Strategy for the years 2008-2011

# Overview

The Republic of Moldova is according to its constitution a unitary state. It is divided into thirty-two districts (rayons), three municipalities (Chisinau, Balti, Bender), one autonomous-territorial unit (Gagauzia) and one territorial unit with undefined status (Transnistria). Moldova has a population of slightly more than 4 million; 3.6 million of the population is living in the area controlled by the Moldovan Government and slightly more than half a million live in Transnistria (including Bender).
In the Moldovan territorial structure, three entities stand out:

- the capital Chisinau: there is a great difference between Chisinau municipality and the rest of the countryâ##s territory in economic activity, in the living standard and the development of infrastructure and production factors. Chisinau is inhabited by 21% of the countryâ##s population and generates approximately 50% of the GDP.
- Gagauzia, which is inhabited by an ethnic minority and which enjoys some limited autonomy rights.
- Transnistria, a breakaway region, which is not controlled by Moldovan public authorities. Transnistria covers 12% of the territory.

In 2010 the National Strategy for Regional Development was approved and related structures were created, notably a National Council for Coordinating the Regional Development, three Regional Development Agencies with Regional Development Councils. And finally a National Fund for Regional Development was established as a financial instrument. It is not clear yet, whether these support tools will also be used for funding of R&D and innovation activities.
In R&D, the exceptional status of Chisinau is also evident. Among the 54 organisations accredited in the years 2005-2010 by the National Council for Accreditation and Attestation (CNAA ) to carry out research and development activities, only two were situated outside Chisinau, namely in Balti. The volume of R&D funding allocated to these two organisations in 2009 from the state budget amounted to about 3.5% of total funding for research projects and the share of R&D personnel of these organisations of overall Moldovan R&D personnel was similar (Report of ASM, 2009). The location of higher education institutions accredited by the Ministry of Education confirms this concentration of capacities in the capital. Only six of the 30 accredited Moldovan universities are located outside Chisinau: in Balti, Cahul, Comrat, Taraclia. In addition, limited research activities at institutions in Transnistria, which are not accredited by the Moldovan authorities, have to be considered. This concerns for example the Taras Shevchenko University

# Regional research programmes

Local authorities, in accordance with the Code on Science and Innovation , have the following rights in R&D policy:

- participate in the development and promotion of state policy in science and innovation at the regional level;
- fund regional R&D and innovation programmes and projects from the budget of the administrative-territorial unit;
- create science and innovation organisations financed from the budget of the administrative-territorial unit;
- promote the implementation of technologies and cooperation of R&D organisations and businesses in the region.

But actually, there is no specific regional approach to the design or implementation of research policy. There are no national research programmes with a regional focus or specific regional research programmes, and none are planned to be developed. There are no special bodies at the regional level, which are responsible for R&D development.

Nevertheless, some specific examples of support measures for R&D at the regional level indeed exist. In Chisinau annual prizes for young scientists are awarded, and the municipal authorities conclude some contracts with researchers and research institutions for carrying out scientific projects relevant for the capital (in the local energy sector, cultural heritage of the city, etc.). Another case for regional support measures, although a rather special one, is the breakaway region of Transnistria, where research activities are funded from local budgets.

At the level of transnational regional cooperation, Moldova participates in the EU regional support programme South-East Europe . Among the priorities of this programme are support for policy fields such as innovation and environment. Moldovan institutions (e.g. Moldova Technical University) participate in 5 projects out of 40 overall supported projects within this programme. The projects with Moldovan participation are mostly environment related.

Two more EU cross-border cooperation programmes are relevant for Moldova: the Romania-Ukraine-Republic of Moldova Cross Border Cooperation and the Black Sea Cross Border Cooperation. Priorities in these programmes focus on economic development, environment, culture and education, and people-to-people contacts. Under the heading people-to-people contacts shall cooperation among local and regional governance authorities, educational institutions, NGOs, etc. be established and strengthened across the border. This shall, in turn, reinforce cooperation in the other priorities. Support for R&D and especially innovation activities among companies are included in these priorities. First calls were launched in both programmes in 2009 and selected projects started its implementation in late2010. A second call in the Black Sea Cross Border Cooperation shall be launched in April 2011.

Another regional cooperation relevant for Moldova is the EU inspired macro-regional cooperation for the Danube region. The EU Strategy for the Danube Region

# Fiscal Policies

Moldova has introduced several types of tax incentives for R&D and innovation in recent years.

Import of equipment to Moldova is exempt from customs duties since 2006. According to the respective Law on Customs duty exemption for goods imported by organisations in science and innovation (no.115) , this exemption is only valid for research organisations accredited by the National Council for Accreditation and Attestation (CNAA). The law foresees that the government shall submit annually to Parliament a proposal for modifications of the annex to the law, where the duty-free equipment is specified.

Fiscal incentives apply also for promoting research careers: doctoral and postdoctoral fellowships are exempt from all taxes (social contributions, contributions to public medical insurance, income taxes, etc.). Academicians and corresponding members of the Moldovan Academy of Sciences (ASM) are also not paying taxes on their allowances (which they receive in addition to their salaries or pensions).

Finally, fiscal incentives were granted in 2007 to residents of science and technology parks and of innovation incubators (Law on Science and Technology Parks and Innovation Incubators (No. 138) . Residents of technoparks and incubators can be natural or legal persons (research organisations, innovation service providers, innovative companies), but their status as resident needs to be approved by the Supreme Council for Science and Technological Development of the academy. The following tax incentives apply for residents:

- exemption of VAT (20%) on goods and services imported from abroad and on those bought in the Republic of Moldova;
- exemption of customs taxes (5%) on imported goods and services;
- exemption of income tax.

In addition to these tax breaks, residents enjoy low tariffs on premises leasing and on public utilities, and the State Agency on Intellectual Property (AGEPI)

# Human Resources Policies

The Moldovan R&D personnel has declined from25,200 in1990 to around a fifth of this level 20 years later. This was caused by a sharp reduction in R&D spending during this period, which led, as a consequence, to a very low remuneration of the R&D personnel. Human resource policies need to be seen in this context.

One challenge to be addressed in human resource policies is therefore an increase in remuneration of the R&D personnel. The issue was tackled and salaries of researchers increased in the period 2004-2008 about four times (ASM Annual Reports ). Scholarships for doctoral candidates and allowances for members of the Moldovan Academy of Sciences (ASM) were also increased. Each doctor of science and habilitated doctor receives currently (early 2011) a monthly allowance (â#¬20 and â#¬50). Each member and corresponding member of the ASM receives a lifetime monthly allowance (â#¬150 and â#¬200).

Involving students in research and keeping young researchers in science is a second challenge for human resource policies in Moldova. In this respect several measures have been taken:

- Quotas for young researchers have been introduced in projects supported under public R&D funding programmes: young researchers of up to 35 years need to make up at least 30% of researchers working on a project funded under the State Programmes for Research and Development and 20% in projects under the institutional funding programme.

- A specific competitive support programme for young researchers of up to 35 years has also been put in place. Competitions are held annually in this scheme and projects are supported up to a maximum period of two years. Since2007 anumber of 90 projects were granted for small teams and 23 individual projects for young researchers (See also chapter *Competitive funding*).
- For PhD students, two incentive schemes are in place: Excellence Grants of the Government of Moldova (in the amount of â#¬160 per month) and so-called nominal scholarships (in the amount of â#¬125 per month) are awarded annually. These scholarships are granted to excellent PhD students by the government, at the proposal of the Supreme Council for Science and Technology Development (SCSTD). As an eligibility criterion for these schemes, applicants have to have authored at least three papers, of which at least one in a specialised international journal (See also chapter *Other modes of funding*). For doctoral programmes 4-4.5% of the total public R&D budget are allocated overall.
- For attracting young research talent the academy has established over the past three years educational institutions within its structure: the Lyceum for gifted children and the University of the ASM. The university was created for education and training of future scientific staff.

When it comes to mobility of researchers, Moldova faces in general the challenge that skilled people have left and still leave the country because of shortage of adequate jobs and low salaries. At the end of 2008, ASM has therefore launched an initiative to develop the cooperation between scientists still working in the country and the Moldovan â##Scientific Diasporaâ##. Two international projects are relevant in this context:

- Connecting the Moldovan scientific diaspora to the development of the country of origin, financed within the Swiss SCOPES Programme.
- Addressing brain-drain through temporary return of expatriated Moldovan scientists and overseas young researchers to strengthen Moldova as a R&D hub and to promote temporary and permanent return and skill transfer, funded by the European Union and implemented by the International Organization for Migration. The project aims at enabling short term research and teaching visits of 7 to 11 days for 30 representatives of the Moldovan scientific diaspora.

Mobility of reseachers is stimulated mainly through international projects, especially through the bilateral R&D funding schemes, which have been put in place by the academy with certain countries (See also chapter *Competitive funding*

). Another measure for researcher mobility has been imposed on research organisations accredited with the National Council for Accreditation and Attestation (CNAA): in order to be accredited, expenditure on mobility and on the purchase of equipment must not be less than 20% of the expenditure of a research organisation.

A fourth challenge in the context of human resource policies concerns the reform of the education system. Moldova became full member of the Bologna Process

# Interaction between Knowledge Triangle Policies

Cooperation between research and business is a major challenge in Moldova. This link got disrupted to a large extent as a result of the transition phase, through which the economy has been passing since Moldova became independent. In this transition phase the division of labour between companies and R&D institutes within the Former Soviet Union broke down and Moldovan companies got disconnected from customers in this region. R&D intensive state owned companies had to focus on the production of goods, which could be sold under market conditions. Several did not succeed in this endeavour and were shut down, and those which were more successful in this adaptation process, did cut back on R&D expenditure. Moreover, public R&D funding was reduced drastically and therefore not any more available for stimulating cooperation between research institutes and business, let alone for support of private R&D.

Current framework conditions such as strained public budgets, limited number of innovative companies, low R&D expenditure of business, and migration of qualified personnel abroad are not very conducive to innovation activities. Nevertheless, a few actions have been taken to stimulate innovation.

The Agency for Innovation and Technology Transfer (AITT)

was established in 2004 for coordinating, stimulating and implementing technology transfer and innovation activities. The agency is part of the Moldovan Academy of Sciences (ASM). Its main innovation support instrument is an annual call for Innovation and Technology Transfer Projects, which shall link up research organisations with companies. The AITT budget for the call 2009 amounted to â#¬413,000. Supported projects foster collaboration between research institutions and companies to test and implement scientific solutions in practice. Due to the limited resources available with companies for R&D, and not to speak of venture capital, the projects cannot be considered investment projects, but are focused on modest implementation of solutions. In this scheme the funding of the research organisations is covered by AITT, while the business partners need to provide co-funding of 50% of the overall project cost. Other stimulation instruments of the agency concern awards for the best innovations of the year, business plan competitions, and an online virtual market of inventions and technologies.

Another innovation support measure was introduced in 2007 through the Law on Science and Technology Parks and Innovation Incubators (No. 138)

. As a result there exist currently three scientific-technological parks and one innovation incubator in Moldova:

- Technopark Academica, no specific thematic focus, 27 residents;
- Technopark Inagro, specialised in ecological and intensive agriculture, eight residents;

- Technopark Micronanoteh, specialised in nanotechnologies and microelectronics, a competition for the selection of residents has been announced;
- Innovation Incubator Inovatorul, no specific thematic focus, 4 residents (See also chapter *Sectoral policies*).

In spring2011 acompetition was held to establish innovation incubators within universities. Two more incubators were selected and will be established with support from AITT.
The link between education and research was relatively weak back in the times of the Soviet Union. Research was concentrated mainly in the academy sector and in branch research institutes subordinated to ministries. Higher education institutions were traditionally focussed on education; they performed only limited research and had few links to business. This traditional pattern has still a certain influence on the current situation, but research in the higher education sector is catching up.
The academy is trying to tackle this issue through its scientific-educational cluster â##UnivER SCIENCEâ##
. For integrating education with research and business, the cluster includes the ASMâ##s Lyceum for gifted children, the University of the ASM

# Other Policies

The Moldovan R&D system is dominated by the Academy of Sciences (ASM)
. Apart from the academy, which fulfils the role of a ministry of science, some other ministries deal with R&D and innovation related issues.
The Ministry of Finance
has an important influence on the R&D sector through shaping the national budget, which includes the allocation of government resources for R&D. In addition it sets the standards for the design, implementation and monitoring of funding programmes, and it supervises the spending of public resources and the execution of the budget for science.
The Ministry of Economy
addresses issues of R&D policy in the context of ensuring economic competitiveness and attracting foreign investment. Its tasks include policy-making for the implementation of R&D results, and innovation and technology transfer in industry and energy. But de facto the ministry pays little attention to the implementation of innovation policy.
The Ministry of Environment
is, besides the academy, a governmental player managing own R&D funds. It allocates moderate R&D funding through its National Environmental Fund. The fund supports scientific projects in the field of environmental protection.
Within The Ministry of Agriculture and Food Industry
a subdivision, the Directorate for Training, Research, Dissemination and Information Technologies, has to coordinate the design, monitoring and evaluation of R&D policy in this sector. But in practice it has little influence on the implementation of R&D policy.
The State Agency on Intellectual Property of the Republic of Moldova (AGEPI)

# Government policy making and coordination

The key actor and main policy making body in Moldovan S&T is the Academy of Sciences of Moldova (ASM)
. It has the role of a ministry for research and provides advice on science matters to other public authorities. The academy concludes a â##Partnership Agreementâ## with the government, in which its rights and responsibilities are specified in detail. In line with the current Partnership Agreement (2009-2012) and the Code on Science and Innovation, ASM has the following tasks:

- it is responsible for policy formulation, decision-making and coordination of the scientific and innovation activities and implements the state policy in this field;
- it identifies strategic directions in the field of science and innovations and distributes budget allocations in accordance with them;
- it elaborates governmental funding programmes and international scientific-technical programmes, and implements them.

It needs to be noted that in addition to its policy-making function, the academy is at the same time the main policy implementation body. It is a research and innovation funding agency, a research institution, and takes also care of higher education in the frame of its own university.
The Moldovan Government
has delegated the competence to carry out the state policy in the field of science and innovation to the academy on the basis of the Partnership Agreement. The government itself has the following responsibilities:

- it organises the elaboration of legal acts and submits them to the Parliament for examination;
- it provides stimulation of scientific and innovation activities and the utilisation of the results of such activities;
- it concludes intergovernmental agreements on R&D and innovation cooperation;
- it provides support for R&D and innovation infrastructure; and
- it awards prizes.

The Moldovan Parliament
adopts legal acts, approves strategic directions and the amount of financial resources for R&D, and ratifies international agreements in the field of science and innovation. The Parliamentary Committee on Culture, Education, Research, Youth, Sports and Media is responsible for the analysis and improvement of draft acts related to science and innovation.

In Transnistria, a Supreme Advisory Council on Science and Technology takes care of R&D strategy formulation and definition of priorities. The head of the local administration subsequently determines the research policy, which is being implemented by the department for education. The regional legislature approves legal acts for R&D.

# Science Policy Advice

The Moldovan Academy of Sciences
(ASM) is the main adviser to the Parliament and the government on science and innovation matters. Since ASM fulfils the role of a ministry of research, it participates in the preparation of all acts in the R&D and innovation field. ASM proposes laws and government decisions for approval to Parliament and government and issues itself legal acts such as regulations on R&D and innovation. Policy proposals are planned within the academy leadership and certain institutes take care of practical preparation and drafting.
Within the academy, its supreme body, the Assembly of the Academy of Sciences
, is formally entitled to provide advice on science and innovation matters. The assembly is a huge body of more than 180 scientists, consisting of full and corresponding members of ASM and of habilitated doctors. It examines and approves programmes and strategies related to science and innovation.
The executive organ of the academy and its assembly is the Supreme Council for Science and Technological Development (SCSTD)
. It makes proposals for the development of science and technology policy and deals in parallel with policy implementation. In addition, a committee on science ethics established within the ASM structure has a limited advisory role.
There are a number of committees and associations outside of ASM also providing advice, although with a limited impact on the state R&D policy.

- Professional societies such as the Moldovan Physics Society, Moldovan Genetics Society, etc. exert a certain influence on their specific scientific field.
- Rectors of public and private universities meet in their own forum, the Moldovan Rectorsâ## Council. The council drafts proposals for the development of higher education and science policy. It focuses on research in HEIs.
- Another body representing the interests of scientists is the Association of Young Researchers of Moldova "PRO-Science". It is an interest organisation for young scientists and supports them in solving their problems.

In Transnistria, a Supreme Advisory Council on Science and Technology of the local administration takes care of R&D strategy formulation and definition of priorities.

# Tools for policy advice

Among the tools for policy advice, it is evaluations that are mostly used in Moldova. Even so, the culture of research policy evaluation is still weakly developed and the whole evaluation cycle is not embedded in national policy-making. Some summary judgments on various policy actions are made in the meetings of the Supreme Council for Science and Technology Development
(SCSTD) and by its departments. The results of such assessments are not published though. The focus of evaluation in Moldova is primarily on research organisations, and on R&D and innovation funding programmes and projects.
R&D institutions wanting to become eligible for public funding have to undergo an evaluation and accreditation procedure, which is conducted by the National Council for Accreditation and Attestation
(CNAA). The CNAA is a governmental body and not part of the academy structure. The same objectives, criteria and methodology apply for the evaluation and accreditation of different categories of organisations that undertake R&D activities. They are stipulated in the Code on Science and Innovation of 2004.
To be accredited, an organisation has to meet a number of mandatory requirements, such as having a scientific council, having a minimum of 13 doctors and habilitated doctors, allocating at least 20% of its budget for the procurement of equipment and for mobility, and editing a scientific journal.
Evaluation criteria for organisations refer to the scientific level of research results, their applicability and implementation potential, competence of staff, collaboration with similar organisations at home and abroad. The criteria are operationalised as quantitative and qualitative indicators that cover the whole range of R&D activities of an organisation.
For each organisation to be evaluated, the CNAA creates a special assessment committee, which recommends the accreditation or non-accreditation. An accredited research organisation becomes member of the Academy of Sciences and obtains access to governmental R&D funding:

- institutional members â## public research institutes which are administrated directly by ASM;
- profile members â##state universities and public research institutes founded by ministries;
- affiliated members â## private research organisations.

Depending on its statute, the organisations get different levels of competitive governmental funding for their research activities (e.g. affiliated members can obtain funding from public sources of up to 40% of project cost).
Research programmes are mainly evaluated ex-ante and during their implementation. According to the legislation, all competitive R&D and innovation funding programmes and projects supported under these programmes have to be evaluated. The evaluation is performed by the academyâ##s Consultative Council for Expertise
. (See also chapter *Competitive funding*.)

These data are consolidated and presented per different programme in the annual activity reports
published by the SCSTD. In addition to the reporting requirement, the SCSTD organises at the end of each year hearings and discussions on programmes. The reports and subsequent hearings generally assess the scientific results, but not the overall effectiveness of a certain programme.
Foresight exercises have not been implemented yet in the Republic of Moldova. But in 2010 ajoint Moldovan-Romanian bilateral project started with the aim to prepare the launch of a national foresight exercise in R&D. It is intended to use experience gained by the Romanian partners in the development of the Romanian National Strategy for Research, Development and Innovation 2007-2013
.
Moldova has limited experience with benchmarking exercises. Research policy-makers generally make use of existing international comparative studies and statistical databases in order to compare the performance of the national R&D system and of researchers in an international context.
Consultation processes are used in preparation of some decisions. The level of involvement of actors and the impact of consultations vary from case to case, as there is no procedure specified for such consultations.

# Actors in policy implementation

The Moldovan Academy of Sciences
besides its functions as policy maker and research organisation is also the main policy implementation body. It manages directly or through subordinated agencies most of public R&D funding.
R&D policy is basically implemented through decisions of the Supreme Council for Science and Technological Development (SCSTD)
, which is an executive body of the academy. The Supreme Council consists of 17 members, including the academy leadership and representatives of the scientific community. It distributes R&D budget allocations on the basis of the Partnership Agreement between the government and the academy.
The Supreme Council coordinates the elaboration of R&D support programmes, and supervises its implementation and monitoring.
State Programmes for Research and Development
are the main public and competitive R&D funding instrument. Moreover, the Supreme Council provides competitive funding through institutional projects, excellence awards, grants for young researchers and for purchasing scientific equipment.
The Moldovan Agency for Innovation and Technology Transfer
(AITT) is a funding agency for support of innovation and technology transfer. It shall stimulate the cooperation of research institutions with business. The agency was established in 2004 and is also part of the Moldovan Academy of Sciences. One of its main competitive funding tools is the annual call for Innovation and Technology Transfer Projects. This call has been implemented since 2005. Other funding tools managed by the agency concern support for technology transfer infrastructure (technoparks and incubators), and innovation prizes such as for business plans and technical innovations. Moreover the agency takes care of some promotional measures of innovations through a publicly accessible database and presentation of innovations at its website.
A Centre for International Projects of the Academy
was established in 2009. It shall promote and administer bilateral grant programmes and international projects in R&D (including FP7 projects).
R&D and innovation projects submitted to the different competitions organised by ASM and its subordinated agencies are evaluated under the auspices of the academyâ##s Consultative Council for Expertise
.
In Transnistria limited R&D funding is provided through the local administration; its department for education is responsible for policy implementation.

# Funding flows

| | 2006 | 2007 | 2008 | 2009 | EU-27, 2009 |
|---|---|---|---|---|---|
| **GERD1 â#¬ million)** | 12.1 | 18.7 | 24.3 | 22.0 | 236,820.299 |
| **GERD1** per capita2**â#¬)** | 3.4 | 5.2 | 6.8 | 6.1 | 473.9 |
| **R&D intensity1** | 0.46 | 0.65 | 0.6 | 0.59 | 2.01 |
| **BERD (â#¬ million)** | n/a | n/a | n/a | n/a | 146,936.684 |
| **GERD financed by business enterprise as % of total GERD** | n/a | n/a | n/a | n/a | 54.7 (2008) |
| **GERD financed by abroad as % of total GERD3** | 2.6 | 2.7 | 3.7 | 6.5 | 8.7 |
| **GBAORD4** | 11.1 | 17.7 | 22.9 | 19.9 | 80,306 |

| | | | | | |
|---|---|---|---|---|---|
| **GBAORD4** | 1.9 | 2.3 | 2.6 | 2.1 | 1.48 |

Sources of data: 1

ASM annual reports; 2 National Bureau of Statistics (population); 3UNESCO data on science and technology; 4Reports of Ministry of Finance for 2006, 2007, 2008 and 2009 on implementation of the state budget.

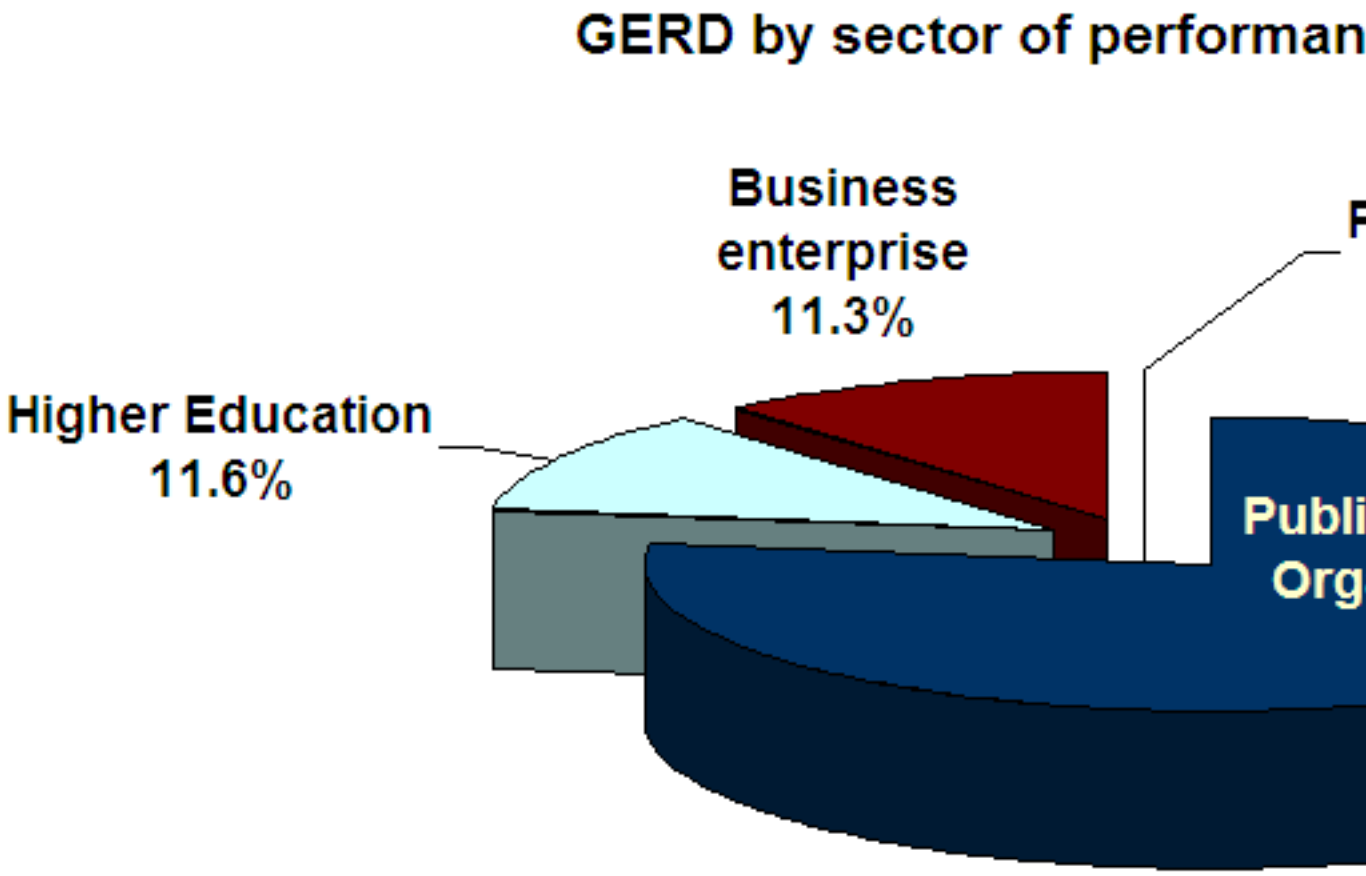
Exchange rate: 1 Euro = 16 Moldovan Lei (MDL)

***GERD by R&D performers***

| | ***PRO*** | ***Business enterprise*** | ***Higher Education*** |
|---|---|---|---|
| 2006 | *74%* | *15.8%* | *10.2%* |
| 2007 | *73.4%* | *15.5%* | *11.1%* |
| 2008 | *73.9%* | *14.1%* | *12.0%* |
| 2009 | *77.1%* | *11.3%* | *11.6%* |

***Source:***

UNESCO




For Moldova only fragmented data on R&D funding and on performance of R&D are available. The presented figures rely mostly on data from annual reports of the Moldovan Academy of Sciences (ASM)
. These data include all expenditure of research organisations accredited with the Moldovan National Council for Accreditation and Attestation, and which receive funding from the state budget. Data do not include R&D expenditure from general university funds and cover only a rather limited share of private R&D funding (only co-funding of private business in technology transfer projects supported by the Agency for Innovation and Technology Transfer â## AITT is considered). Gross Domestic Expenditure on R&D (GERD) does

therefore not give the whole picture of R&D funding and is underestimated. GBAORD data are indicated according to reports of the Ministry of Finance on budget implementation. The figures do not include R&D funding in Moldovaâ##s breakaway region Transnistria.

Gross Domestic Expenditure on R&D (GERD) was on the rise in Moldova until 2008, when it reached the top in absolute figures with â#¬24.3m (or 0.6% as a share of GDP). As a share of GDP it had attained the peak already in the previous year 2007 with 0.65%. Policy makers had foreseen to increase R&D expenditure steadily and to achieve a level of 1% GBAORD as a share of GDP by 2008 or 2009. The target was missed in 2008 and due to the international economic crisis, Moldova had even to cut back on expenditure. As a result GERD decreased in 2009 reaching an amount of â#¬22m. GERD as a share of GDP was hence equivalent to 0.59%, which is substantially lower than in EU countries. The budgetary cuts can be illustrated with the planned budgetary expenditures for R&D in 2009: the government had approved â#¬30.3m for R&D activities, but allocated only â#¬19.9m (Report of the Ministry of Finance on implementation of the state budget in 2009

). The policy goal of 1% GBAORD is still mentioned in the Code on Science and Innovation. In the currently valid partnership agreement between the government and the academy (2009-2012), it was foreseen to be reached by 2011. But as a result of an amendment it was removed from the agreement and is now annually fixed (e.g. for 2010 a target of 0.53% GBAORD of GDP was set).

R&D funding is dominated by the government sector. R&D funding by business-enterprise and higher education institutions can be estimated as being rather low. But no data are available. Funding from abroad was according to data of the UNESCO Institute of Statistics (UIS) reaching 6.5% of GERD in 2009. R&D funding from private non-profit organisations is insignificant to non-existent.

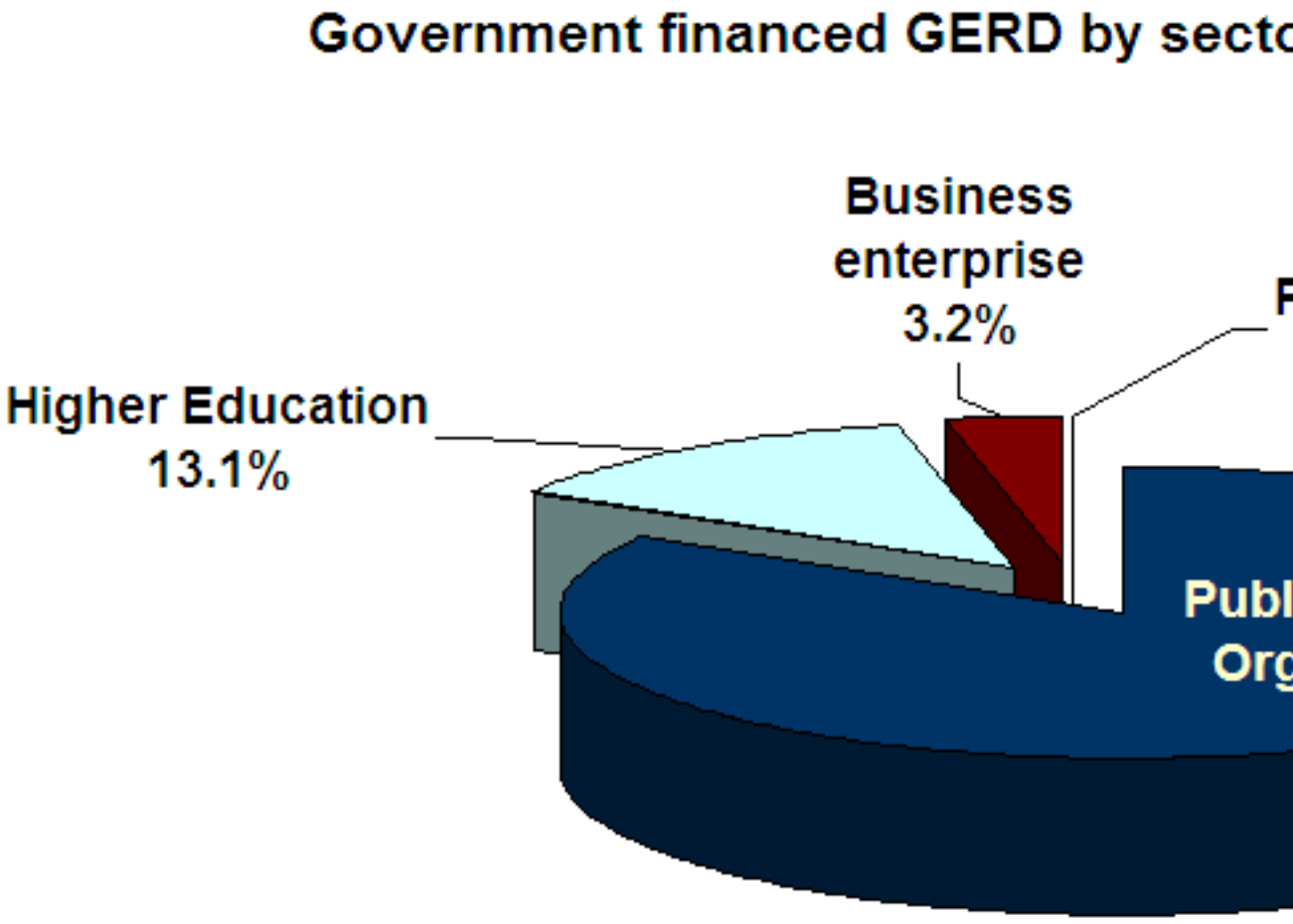
For sectors of performance of R&D, data of UIS show for 2009 that in Moldova the overwhelming share of R&D was performed in the governmental sector (77.1%) and that this share was even increasing in the economic crisis at the expense of the business enterprise sector. The business enterprise sector performed 11.3% and herewith even less than the higher education sector with 11.6%, whereby the latter one shows in general an upward trend over the last years. The private non-profit sector is insignificant in R&D performance too.

R&D funding in Transnistria has to be considered in addition to the figures presented above. In Transnistria, governmental R&D funding by the local administration was provided in2009 inthe amount of about â#¬0.95m (13.4 million Transnistrian Roubles) or 0.8% of the budget expenditures of the region. This budget was performed to more than 50% in the governmental sector and to around 40% in the Transnistrian higher education institution.

## Overview

***Government financed GERD by sector of performance (estimate)***

| | ***Government (Research institutions)*** | ***Business enterprises*** | ***Higher Education*** |
|---|---|---|---|
| 2009 | *83.7%* | *3.2%* | *13.1%* |




The public R&D funding by sector of performance has been calculated by the authors on the basis of data in the annual report 2009 of the Moldovan Academy of Sciences (ASM). Figures include all expenditures of accredited organisations in science and innovation which receive funding from the state budget (without R&D funded by general university funds). Figures do not give a complete picture, but are a kind of approximate estimate: they are calculated based only on data for competitive funding schemes and for the institutional funding scheme (See also sections *Institutional* and *Competitive funding* below), not considering expenditure on administration, staff training, capital investments, etc.

The overwhelming share â## more than 80% â## of public R&D funding is performed in the government sector, by institutes of ASM and branch research institutes of ministries. The business enterprise sector performs with 3.2% of public R&D expenditure only a minor share, because in this category only two state-owned enterprises receive allocations and are calculated here. Private businesses are not accredited as research organisations in Moldova and are therefore not eligible for public R&D funding. The share of the higher education sector was 13.1%, which is generally increasing over recent years.

Nearly all governmental R&D and innovation funding is distributed by ASM

. Only research organisations accredited with the National Council for Accreditation and Attestation (CNAA) are eligible for public R&D funding. Roughly around 80% of public R&D funding is allocated through block funding/institutional funding (See also section *Institutional Funding* below), in a non-competitive mode.

Competitive funding (see section *Competitive funding*

below) makes up close to 15% and other funding modes around 5%. These funding modes are distributed through various schemes including State Programmes for R&D, Innovation and Technology Transfer Projects

## Institutional Funding

Block funding/Institutional funding continues to be the main form and lionâ##s share of public research funding in Moldova. Most of this allocation mode is provided through the scheme â##institutional fundingâ##, which is based on project proposals. Proposals have to be submitted to the Moldovan Academy of Sciences (ASM)

. In 2009 around 60% of GERD were allocated through the support scheme â##institutional funding.

Another roughly 20% of GERD are allocated to the academy as block grant (budget funds) for administration, facilities, its subordinated agencies (Agency for Innovation and Technology Transfer, Library, etc.), innovation infrastructure (Technoparks, Innovation Incubator), etc.

| | 2006 | 2007 | 2008 | 2009 | 2010 |
|---|---|---|---|---|---|
| Institutional funding**,** | 7.2m | 10.6m | 13.4m | 13.2m | 12.5 |
| Share of estimated GERD, % | 59.5 | 56.7 | 53.6 | 60.3 | - |

***Source***

: Calculation by authors based on ASM annual reports

Only organisations accredited with the National Council for Accreditation and Attestation (CNAA)

can receive institutional funding. Therefore institutional funding is provided also on the basis of project proposals and a formal selection procedure has to be followed: proposals are submitted to the academy and then evaluated by the ASM Consultative Council of Expertise (CCE) according to generally applied criteria for funding programmes in Moldova (See also section *Competitive funding* below). The Supreme Council for Science and Technology Development of the academy approves the funding of proposals. De-facto this procedure is not competitive, as proposals do not compete with each other and the funding amounts are more or less pre-defined.

The duration of institutional projects was five years so far, but for the current funding period (2011-2014) was shortened to four years. The annual amount of funding is specified in the project contracts. Resources can be spent on costs of R&D personnel, the maintenance of facilities and on equipment.

## Competitive funding

Nearly all competitive R&D funding from public sources is provided through the Moldovan Academy of Sciences (ASM)

. Only research organisations accredited by the National Council for Accreditation and Attestation (CNAA) are eligible for receiving public R&D support. In 2009 competitive funding made up 12.7% of the estimated GERD.

The following table gives an overview of competitive funding schemes and amounts of funding allocated (amounts in â#¬):

| Scheme / programme | 2006 | 2007 | 2008 | 2009 | 2010 |
|---|---|---|---|---|---|
| State programmes for Research and Development | 687,500 | 1,248,500 | 1,118,700 | 1,148,600 | 572,500 |
| International projects | 368,200 | 325,300 | 408,000 | 576,000 | 368,200 |
| Grants for procurement of equipment | - | 499,000 | 364,000 | 343,700 | 312,500 |
| Grants for young researchers | - | 125,000 | 268,700 | 306,600 | 325,000 |
| Innovation and Technology Transfer Projects | 188,000 | 519,000 | 513,000 | 413,000 | 510,000 |

Source: ASM annual reports

The main competitive R&D funding programme in Moldova is the State Programmes for Research and Development

. It is a mixed scheme, involving bottom-up and top-down definition of strategic priorities: general research themes for thematic sub-programmes within this funding scheme are proposed by the scientific community to the ASM. The government decides then, which topic shall form a thematic programme. The thematic programmes are approved for a four-year period with annual funding and reporting cycles. Calls for project proposals are therefore launched annually for each thematic programme, for which the four year cycle has not

ended yet. Since the start of the measure in 2004 and up to2010, anumber of 26 thematic programmes have been implemented, in the framework of which 271 R&D projects were funded. A total of â#¬5.3m was allocated in this period from the state budget.
Under the programme category international projects
fall some bilateral joint R&D funding programmes with important partner countries for Moldova. Such bilateral programmes are in place with Germany, Romania, Ukraine, Belarus and Russia. Governmental funding covers costs of Moldovan researchers, who participate in projects selected within these bilateral programmes. The budget allocated during the period 2006-2010 amounts to â#¬2.1m. The bilateral programmes are de-facto bottom-up, as mostly broad research fields are defined for its calls allowing for proposals from a wide variety of disciplines.
Projects for procurement of equipment are granted since 2007. Purchased equipment is supposed to be used by several organisations. The amount allocated from the state budget for projects funded in this programme reached â#¬1.5m in the period 2007-2010. Researchers can propose in a bottom-up approach equipment for purchase to the ASM.
Projects for young researchers
are also granted since 2007. Governmental funding of around â#¬1.0m was spent in this programme in the period 2007-2010. Calls for project proposals are launched annually. Selected projects may last up to a maximum of two years. The eligibility criteria require that at least four young researchers of up to 30 years participate in the project, including no less than 50% of graduate and doctoral students. A researcher with a scientific degree (at least PhD) of up to 35 years has to be the project manager. Projects have to be within the general S&T priorities (See also section *Thematic R&D priorities*); as these are rather broad, the programme follows mainly a bottom-up approach (See also chapter *Human Resource Policies*).
All these programmes are administered by the Supreme Council for Science and Technology Development (SCSTD)
. It organises the calls, takes the funding decisions and monitors the projects selected.
Innovation and Technology Transfer Projects (Link to Template measure) try to link up research with implementing organisations, especially with businesses. The programme is administered by the Agency for Innovation and Technology Transfer (AITT)
. The agency organises the annual calls and monitors the projects selected for funding. The approach is bottom-up, because the thematic fields of this call are very broad. The total budget for 2006-2010 was â#¬2.2m. Selected projects are supported for a two-year period. The eligibility conditions require co-funding of at least 50% of the overall project cost from non-public sources.
Project proposals submitted in the framework of competitive funding programmes are evaluated by the ASM Consultative Council for Expertise. The general selection criteria are common for all competitive funding schemes (see also the support measure State Programmes for R&D
):

- correspondence of the objectives and results of investigations of programme / project to the strategic directions of science and innovation;
- the scientific level of the programme / project, the competitiveness of planned results;
- scientific objectives;
- applicability and economic potential of the results;
- composition of the project team, including participation of young scientists;
- competence of personnel;
- material and technological basis of the involved organisations;
- project management;
- social and economic effects of programme/project implementation.

But in addition, for each programme specific selection criteria may apply.

## Other modes of funding

A well established R&D funding mechanism in Moldova is excellence awards. The following types of competitive awards are granted annually by the Academy of Sciences (ASM)
:

- Scientist of the Republic of Moldova (â#¬3,000) and Young Scientist of the Year (â#¬1,250);
- ASM Award for scientific papers: 6 awards for senior scientists (â#¬1,250 per award) and 6 awards for young scientists (â#¬625 per award);
- Excellence Grants of the Government of Moldova and nominal scholarships for PhD students. In 2010 20 excellence grants (in the amount of â#¬160 per month) and 7 nominal scholarships were awarded (in the amount of â#¬125 per month) (See also chapter *Human Resource Policies*).

Some more public R&D funds are allocated by ASM to science administration, staff training, and capital investment. On the basis of individual decisions of the Supreme Council for Science and Technology Development (SCSTD)
of the academy funding is granted for publishing of books, for organisation of scientific conferences, for research on specific topics and other research related activities.
Finally under the category other funding modes falls also indirect funding via tax incentives for residents of science and technology parks and innovation incubators. (See also chapter *Fiscal Policies*

## Overview

Statistics on R&D funding by the business enterprise sector are not available for Moldova. Data of the UNESCO Institute for Statistics show that the business enterprise sector performs slightly more than 15% of R&D (15.5% in 2007). In general R&D funding and performance of the business enterprise sector are quite moderate in comparison to EU countries. This has to do with scarce financial resources, reorientation on non-innovative activities during the years of economic transformation, lack of incentives for R&D, etc.
There are obviously some companies performing R&D in Moldova, but their activities are difficult to trace. The National Council for Accreditation and Attestation (CNAA)
has accredited only two state enterprises as research organisations, which gives them access to competitive public R&D funding. What concerns private companies, a few are performing R&D, e.g. "ELIRI" S. A. Research Institute. Companies that do perform R&D are active in fields such as ICT, microelectronics, agriculture, chemistry, and materials (See also chapter *Research performers - Business enterprise sector*

## Intramural

Statistics on R&D funding by the business enterprise sector are not available for Moldova. Companies that do perform R&D are active in fields such as ICT, microelectronics, agriculture, chemistry, and materials (See also chapter *Research performers - Business enterprise sector*

## Extramural

No relevant information available.

# Funding from abroad

Foreign resources in general and European in particular are quite important for the Moldovan R&D system. Especially during the years of economic crisis at the end of 1990s and at the beginning of 2000s, when national R&D funding was extremely low, funding from abroad was highly relevant. The latest available data on funding from abroad as a share of Gross Domestic Expenditure on R&D (GERD) indicate 2.7% (in absolute figures around â#¬0.5m) for the year 2007 (UNESCO
), but this figure seems underestimated.

**EU funding**

The participation in the EUâ##s 7th
Framework Programme for RTD (FP7) and integration in the European Research Area are considered a strategic priority. Moldova requested in May 2008 the association to the FP7 and negotiations on this association are ongoing since 2010.
However, Moldovan organisations can participate already now in FP7 and the European programme COST having so-called â##third countryâ## status. Since the FP7 was launched, 15 project proposals with participation of Moldovan research groups were selected for funding. The breakdown by specific programme was as follows: Health â## 3; ICT â## 1; Transport â## 1; Infrastructures (INFRA) â## 2; SMEs â## 1; International Cooperation (INCO) â## 3; International Research Staff Exchange Scheme (IRSES) â## 3. (data of May 2010, ASM Department of European Integration and International Relations
)
The Academy of Sciences of Moldova is active in the two FP7 International Cooperation Networks (IncoNet projects) targeting Eastern Europe, Central Asia and South Caucasus which aim to strengthen the bi-regional policy dialogue between stakeholders from the EU Member States and these regions, and to enhance the participation of their research organisations in FP7. Besides, the FP7 ERA-WIDE activity supports cooperation with Moldova in the context of the European Research Area through reinforcing the cooperation capacities of Moldovan research centres. A first FP7 ERA-WIDE project coordinated by the Institute of Electronic Engineering and Nanotechnologies in Moldova started in November 2010, with a nearly half a million euro budget over 30 months. (See also the chapter *Cooperation, coordination and opening up of national research programmes within ERA*
)
Until 2010 a significant number of R&D projects with participation of Moldovan research teams and grants for young scientists from Moldova, were funded also by INTAS, the EUâ##s former R&D and innovation funding programme for the countries of the Former Soviet Union. INTAS covered all different scientific disciplines, but was winded-up in 2010.
Some research related funding from the EU is provided to Moldova also via Structural Funds. Moldova participates in the EU regional support programme South-East Europe
. Moldovan institutions (e.g. Moldova Technical University) participate in 5 projects out of 40 overall supported projects within this programme. The projects with Moldovan participation are mostly environment related. Two more EU cross-border cooperation programmes are relevant for Moldova: the Romania-Ukraine-Republic of Moldova Cross Border Cooperation and the Black Sea Cross Border Cooperation (See also chapter *Regional research policies and programmes*).

**International (non â## EU) funding.**

International (non-EU) programmes relevant for R&D funding in Moldova are the NATO Science for Peace and Security Programme and the Science & Technology Center in Ukraine (STCU). Various projects and workshops were supported by NATO in the fields of geology, agriculture, energy, environment, ICT. Joint NATO and EU funding have contributed to improving the internet access for research and education institutions through connecting it to the pan-European network GEANT. What concerns participation in the STCU, Moldovan organisations have received 16 grants totalling approximately â#¬1.3m since 2006.

**Bilateral funding sources**

R&D funding for Moldova from the USA is provided through two local outfits of US funding organisations. The longest active is the Soros Foundation-Moldova

, which was established already in 1992. It has funded scholarships for PhD students, researcher mobility, publishing of scientific books and the activities of research performing organisations (e.g. Institute for Public Policy). The second organisation is the Moldovan Research and Development Association (MRDA), which was established in 2000 as part of a cooperation agreement between the Moldovan Government and the US Civilian Research and Development Fund (CRDF). Up until 2008, CRDF and MRDA have jointly committed about â#¬2.1m to support more than 250 projects in 38 different grant competitions. More than 2000 scientists were involved in the implementation of these projects.

The Swiss National Science Foundation (SNF) runs the funding programme Scientific co-operation between Eastern Europe and Switzerland (SCOPES)

, where Moldovan researchers are eligible to participate. In the current programme phase 2009-2013 Moldovan researchers take part in 10 projects selected for funding.

Finally Germany

implements with the Moldovan Academy of Sciences a bilateral funding programme, which allows some limited funding of Moldovan researchers from German funds. In 2010 the last call was implemented and 11 projects supported. In 2011 Germany has launched a unilateral call for a number of countries of the Former Soviet Union, including Moldova.

The following table gives on overview of international funding and projects supported in the period 2005-2010. The table was compiled on the basis of a report of the ASM Department of European Integration and International Relations

for the government for the 2005-2010 period).

| Name of programme / funder | Number of projects | Financial amount, â#¬ |
|---|---|---|
| CRDF/MRDA | 141 | 2.4 |
| European Union | 46 | 2.2 |
| STCU | 16 | 1.3 |
| NATO SPS | 6 | 0.9 |
| SCOPES | 25 | 1.3 |
| International Atomic Energy Agency | 4 | 2.0 |
| Total | 238 | 10.1 |

# Private non profit sector

R&D funding by the private non-profit sector is negligible to non-existent in Moldova. Exact data are not available, as this funding category is not yet covered by official statistics. Some local outfits of international foundations, for example the Soros Foundation-Moldova

and the Moldovan Research and Development Association (MRDA), are organised as private non-profit organisations, but they are referred to under the category Funding from abroad (See also chapter *Funding from abroad*

# Important Research Programmes

State programmes for research and development

Innovation and Technology Transfer Projects

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# Higher Education Institutions

The Moldovan Ministry of Education

lists overall 30 accredited universities in the country, including 17 state and 13 private universities. The number of enrolled students reached around 108,000 in the academic year 2010/11, out of which 89,000 students were enrolled in public universities and 19,000 in private ones. There were 303 students per 10,000 inhabitants, which is significantly lower than in the neighbouring countries Romania and Ukraine, but comparable to levels in Bulgaria or Serbia. About 57% of all students are women. The distribution of students per scientific disciplines is 41% of students enrolled in social sciences, economics and law, 18% in engineering, technology, architecture and building, 16% in education science, 7% in humanities and arts, 6% in natural and exact sciences, 6% in public services and 3% in medicine. In 2010 about 28,000 students graduated from Moldovan universities. The number of doctoral students is about 1600 (2009). And finally the teaching staff of universities is around 6,500 persons (2010/11).

The number of students in Moldova increased continuously until 2006/2007 (128,000 students). Since this peak it has been decreasing, because in 2006 the government introduced enrolment rates for all universities. (Data: National Bureau of Statistics
).

In addition to data outlined above, there is one public university
situated in the breakaway region of Transnistria with around 13,000 students and 75 PhD students.

In Moldova a model of separating education and R&D has been preserved, in which universities are primarily teaching institutions, while research activities are undertaken on a relatively limited scale. Only a few universities have conducted substantial research projects. Theoretically, all university teachers must carry out R&D, but usually the staff is overwhelmed with teaching duties and only a few conduct substantial research. Even so, the university sector contributes about one third of Moldovan researchers, who have published in journals included in ISI and about two fifths of patent applications filed. The National Council for Accreditation and Assessment (CNAA)
has accredited 15 universities as R&D performing institutions, including 12 state universities as so-called â##profile membersâ## of ASM and three private ones as â##affiliated membersâ## of ASM.

There are no accurate data available on Higher Education Expenditure on R&D (HERD) in Moldova and on the business share of HERD. According to calculations based on the annual report 2009
of the Moldovan Academy of Sciences (ASM), seven universities received an amount of â#¬2.1m for research projects from the state budget. This is equal to around 10% of Gross Domestic Expenditure on R&D (GERD). Total R&D funding in the higher education sector is higher, as allocations from general funds of universities and other sources need to be considered. Estimates show that the business share of HERD is negligible.

The Council of Rectors of Moldova is the forum of university rectors and its interest organisation. It lobbies for increased funding of university research from the state budget.

In Transnistria the situation is somewhat different as research is concentrated within its university

# Public research organisations

The Moldovan R&D system is dominated by Public Research Organisations (PROs). Research capacities are concentrated especially in the Moldovan Academy of Sciences (ASM)
and its subordinated research institutes. Over 80% of R&D funding from the state budget is allocated to public research organisations (See chapter *Funding flows* and chapters *Government and regional authorities*).

The highest share of R&D activities is conducted in applied areas. Most public R&D institutes belong to the scientific field of natural and life sciences. Researchers from public R&D institutes get the vast majority of patents and are publishing more articles in journals listed in the Web of Science than representatives of the higher education and business enterprise sectors. Under the Code on Science and Innovation all public research organisations are members of ASM.

During the last decade, the most significant reform of the public R&D sector took place in 2004 with the approval of the Code on Science and Innovation
. This reform strengthened the role of the Moldovan Academy of Sciences. As a result in the academy are now concentrated Moldovan S&T policy making, research and innovation funding, as well as research. Restructurings of the public R&D sector were implemented in 2005, when a range of public research organisations were merged into 23 new institutions (Government decision No 1326 on measures to optimise the science and innovation infrastructure), and in 2008, when public research organisations in agriculture were reorganised and their number was reduced to five. (In 2011 the number of agricultural research organisations has risen again to seven).

Data of the National Bureau of Statistics
show that 47 public R&D institutes were operating in2008 in Moldova, which were:

- Institutes of the Academy of Sciences (institutional members of ASM), which report administratively and scientifically to ASM: 19 academy institutes, including 18 accredited by the National Council for Accreditation and Attestation (CNAA).
- R&D institutes subordinated administratively to different ministries (former branch R&D institutes). This category covers also 19 institutes, including 9 of them subordinated to the Ministry of Health and six to Ministry of Agriculture. Scientifically they are supervised by ASM and receive public funding also from the academy. Accredited institutes become so-called â##profile membersâ## of the academy.
- Furthermore there are seven organisations in the category public design-investigation organisations and design offices for construction works.

The strongest research institutes with an established international scientific record in their research area are the Institute of Applied Physics
and the Institute of Chemistry of the academy. An important research branch in Moldova is agriculture and several institutes are active in this field. An example of a PRO in agriculture with a significant share of economic activities is the Institute of Crop Production â##Porumbeniâ##. It has created several corn hybrids on a contract basis for their partners in post-soviet countries; e.g. its hybrids account for 80% of the Belarusian market.

R&D organisations are evaluated regularly by the CNAA, since accreditation is granted for a period of up to five years. In 2011 most institutes have to undergo their second evaluation and accreditation procedure, since accreditation was introduced in Moldova. Evaluation reports of organisations are placed on the official website of CNAA
.

In Transnistria some five more public research organisations are located. They are dealing mostly with agricultural and environmental related R&D, but have rather limited capacities. The most important PROs are the Transnistrian Institute of Agriculture and the National Institute of Ecology and Natural Resources These organisations are subordinated to the departments of the local administration, which are responsible for agricultural and environmental matters.

# Business enterprise sector

Research and development activities of the business enterprise sector are rather difficult to trace for Moldova. The National Bureau for Statistics
(NBS) recorded for the year 2008 the following figures related to the business enterprise sector:

- six private R&D organisations (classified by NBS into the categories design-investigation organisations and design offices for construction works â## organisations in both categories are dealing with applied research and experimental development),
- four mixed (public and private) R&D organisations (two scientific-research institutions and two organisations falling in the category of design-investigation organisations and design offices for construction works)
- and one joint venture organisation.

But these figures are far from complete, because the NBS does not yet systematically collect data on research performing organisations in the business enterprise as well as private non-profit sectors. Therefore data are neither available on the R&D expenditure of these sectors, nor on the top private R&D spenders.

At the time of the dissolution of the Soviet Union at the beginning of the 1990s, the R&D sector in general and also R&D in state enterprises was relatively well developed. This situation changed dramatically with the independence of Moldova. Companies got disconnected from their former research partners and markets, and R&D funding from public resources declined drastically. Most of the industrial R&D potential was lost during the transition years up to now. A few companies tried to preserve their potential in cooperation with foreign partners. This concerns for example the Topaz plant, which was bought by the Russian state company â##Salutâ##
. Other companies, such as the â##Sigmaâ## plant, had to reduce significantly R&D or shifted completely to non R&D related activities.

Today the majority of enterprises in Moldova carry out only minor R&D activities. Those companies performing some R&D fund it predominantly from own resources, and they are primarily focused on the implementation of developments. Most of these companies are located in the capital Chisinau.

Two state enterprises, the Institute of Agricultural Engineering â##Mecagroâ## and the Research and Production Enterprise of Aquatic Biological Resources â##Aquaculture-Moldovaâ## are among the accredited R&D institutions (so-called â##profile membersâ## of the Academy of Sciences) and have access to public competitive R&D funding. Another state enterprise, the Institute for Development of Information Society
is still in the process of accreditation.

While there are no official data available on the major R&D performing companies in the business sector, some of the most successful cases are:

- among the former military-industrial enterprises - "ELIRI" S. A. Research Institute, with specialisation in glass-coated cast microwires and glass coated wires, which develop technologies for customers from several states of the CIS, USA, Israel, South Korea and Romania;
- among companies in new business areas â## Endava Moldova, which is part of an IT services company with the central office inLondon and which executes numerous outsourcing contracts.

For Transnistria it is still more difficult to get a picture on R&D in the business enterprise sector. The spirits and wine producer KVINT

# Labour Market for Researchers

Data from the National Bureau of Statistics (NBS)
show that in 2009 the number of tertiary education graduates reached 26,611 in Moldova. In the same year 1601 students followed doctoral studies. The R&D personnel amounted to 5,424, which was a slight increase in comparison to previous years. This figure is although underestimated, as the NBS does not cover all organisations pursuing R&D activities (especially private businesses) and

R&D personnel in higher education institutions is defined rather narrowly. According to UNESCO Institute for Statistics (UIS) data for 2007, there were 1.83 researchers per thousand labour force and 1.92 researchers per thousand total employed. These figures are significantly lower than in the neighbouring countries Romania (3.27 researchers per thousand labour force and 3.5 researchers per thousand total employed â## both in head count) and Ukraine (3.49 and 3.72). But UNESCO-UIS indicates that the figures for Moldova are underestimated, and moreover, head count and full time equivalents are not calculated as separate indicators.
In this context it needs to be considered that the R&D personnel decreased drastically during the years of economic and political transformation: some 20 years ago, when Moldova became independent, the number of R&D personnel was approximately five times higher. Most of the R&D personnel is employed in the governmental sector. The share of R&D personnel in the higher education and business sectors is increasing, but exact figures are not available.
In addition to these data, the R&D potential of Transnistria has to be considered. In 2009 the R&D personnel amounted to 545 persons, whereby about 65% of the R&D personnel is concentrated in the Taras.Shevchenko Transnistrian State Universityâ##. There were also 75 PhD students in Transnistria.
Mobility of researchers is stimulated mainly through international projects, especially through the bilateral R&D funding schemes, which have been put in place by the academy with certain countries (See section *Competitive funding*
). Another measure for researcher mobility has been imposed on research organisations accredited with the National Council for Accreditation and Attestation (CNAA): expenditure on mobility and on the purchase of equipment must be not less than 20% of the expenditure of a research organisation in order to be accredited.
In general, Moldova has the problem that skilled people have left and still leave the country because of shortage of adequate jobs and low salaries. At the end of 2008, the Academy of Sciences (ASM)
has therefore launched an initiative to develop the cooperation between scientists working in the country with Moldovan scientists working abroad, the so-called â##Scientific Diasporaâ##. Two international projects are relevant in this context:

- Connecting the Moldovan scientific diaspora to the development of the country of origin, financed within the Swiss SCOPES Programme.
- Addressing brain-drain through temporary return of expatriated Moldovan scientists and overseas young researchers to strengthen Moldova as a R&D hub and to promote temporary and permanent return and skill transfer, funded by the European Union and implemented by the International Organization for Migration. The project aims at enabling short term research and teaching visits of 7 to 11 days for 30 representatives of the Moldovan scientific diaspora.

(See also chapter *Human Resource Policies*
).
Visa liberalisation and achieving finally visa free travel is generally an important issue for Moldova. It has lifted visa requirements for EU citizens in 2007 and tries to achieve the same for its citizens with the EU. Agreements on readmission and on visa facilitation, including a visa fee waiver for scientific exchanges, are in force between the EU and Moldova since 1 January 2008. These agreements were complemented by a mobility partnership
, dealing with legal migration, migration and development, and fighting against illegal migration. In January 2011, an action plan for visa liberalisation

# Research Infrastructures

Given the precarious financial situation of Moldova and of R&D in particular, investment in research infrastructure was over the last 20 years rather limited. Research infrastructure in Moldova is available mainly at leading research institutes of the Academy of Sciences
, such as the Institute of Applied Physics or the Institute of Chemistry. A botanical garden is attached to the academy as a specific institute, and a botanical garden is available also in Transnistria.
In the period 2006-2010 â#¬6.7m of governmental funding were spent on procurement of scientific equipment (ASM reports). Grant competitions for purchase of scientific equipment have been held annually. Procurement of equipment was stimulated by the provision that the expenditure on mobility and on the purchase of equipment must not be less than 20% of the expenditure of a research organisation in order to be accredited.
At the international level, some cooperation of Moldovan organisations with CERN was funded previously in the frame of the European INTAS programme (but INTAS was closed in 2010). Long standing cooperation is ongoing with Russia and other countries in the frame of the major infrastructure Joint Institute for Nuclear Research in Dubna, where Moldova was one of the co-founders.
Importantly for Moldova, it is connected to the European data network for research and education â## GEANT, which was facilitated by NATO and EU (FP6 & FP7) grants. And it participates in other European e-infrastructure for research, which is supported by EU funded projects such as South East European GRID (SEE-GRID)
and South East European Research Area for eInfrastructure (SEERA-EI)

# Research Organisations

Quality control measures of research are implemented in Moldova through the National Council for Accreditation and Attestation (CNAA)

. Research organisations, which would like to get access to public R&D funding need to get accredited and have to fulfil certain quality criteria. Accreditation is granted for a period of up to five years. In 2011 most research institutions have to undergo their second evaluation and accreditation procedure, since accreditation was introduced in Moldova. Evaluation reports of organisations are placed on the official website of CNAA (see section 7.2 PRO and section 5.3 Tools for policy advice). The Supreme Council for Science and Technology Development (SCSTD) of the academy also cares for some quality control of R&D.

Institutional funding is the main mechanism of R&D funding allocation in Moldova. Roughly around 80% of the governmental expenditure on R&D is spent in the form of institutional funding. The allocation is based on project proposals, which have to undergo an evaluation procedure. But de-facto this institutional funding allocation is not competitive. For all funding programmes in Moldova (including institutional funding) the same set of general evaluation criteria applies:

- correspondence of the objectives and results of investigations of programme / project to the strategic directions of science and innovation;
- the scientific level of the proposed project, the competitiveness of planned results;
- scientific objectives;
- applicability and economic potential of the results;
- composition of the project team, including participation of young scientists;
- competence of personnel;
- material and technological basis of the involved organisations;
- project management;
- social and economic effects of project implementation.

(See also chapter *Research Funders*

- section *Institutional Funding*

# Knowledge Transfer

Knowledge transfer from research institutions to business is supported by the Moldovan Agency for Innovation and Technology Transfer (AITT)

through the funding programme â##Innovation and Technology Transfer Projectsâ##. Three technoparks and one innovation incubator provide some infrastructure for knowledge transfer. The Moldovan Academy of Sciences (ASM), as the main research institution in the country, tries to stimulate knowledge transfer between education, research and business through its cluster project UnivER SCIENCE. (See also chapter *Interaction between Knowledge Triangle Policies*.)

In general, support for spin-offs and availability of venture capital or business angels are weakly developed in Moldova. Few universities have established technology transfer offices. For example, the Technical University of Moldova

has established the sub-division Technical-Scientific Center of Advanced Technologies Implementation "Etalon". The centre was created on the basis of a former factory within the military-industrial complex of the Soviet Union. The State Agricultural University of Moldova

# Cooperation, coordinations and opening up of national research programmes within ERA

Institutions from Moldova participate in the EUâ##s 7th Framework Programme for RTD (FP7) and in actions supported under the European COST programme. Moldovan institutions are not yet involved in the EUREKA programme.

Moldova has requested the association to the FP7 and negotiations on this association are ongoing since 2010. Currently, Moldovan researchers and research teams can participate in FP7 projects as so-called â##third countryâ## partners and receive EU funding. Since the FP7 was launched, 94 project proposals with participation of Moldovan research groups were submitted and 15 accepted for funding. Project participants include research institutions, higher education institutions, SMEs and NGOs. The breakdown of funded projects by specific programme was as follows: Health â## 3; ICT â## 1; Transport â## 1; Infrastructures (INFRA) â## 2; SMEs â## 1; International Cooperation (INCO) â## 3; International Research Staff Exchange Scheme (IRSES) â## 3 (data of May 2010 of ASM Department of European Integration and International Relations

).

The COST annual report 2009

listed five actions with Moldovan partners: the State Agricultural University of Moldova participated in three actions on forestry, the Technical University of Moldova participated in one action on Materials and Nanosciences, and the Public Association â##Our Home - Chisinauâ## was involved in an action on media transformation.

What concerns participation in ERA.Nets, Moldovais involved in the regional Black Sea ERA.Net

. The partner from Moldova is the Academy of Sciences, which participates with a funding contribution in a pilot joint call for R&D projects of this ERA.Net.

Moldova is also involved in FP7 funded international networking projects for the region: this concerns the S&T International Cooperation Network for Eastern European and Central Asian Countries (IncoNet EECA)
and the S&T International Cooperation Network for Central Asian and South Caucasus Countries (IncoNet CA/SC).
EU Structural Funds are another cooperation tool with some R&D and innovation related funding activities relevant for Moldova. The country participates in transnational and cross-border cooperation programmes with neighbouring countries (See also chapter *Funding from abroad*

# International S&T cooperation

See chapter *Internationalisation of S&T cooperation*

# Orientation

The priority of the current Moldovan Government is integration with the European Union. This extends of course to the field of R&D. In May 2008 Moldova requested its association to the EUâ##s 7th
Framework Programme for RTD (FP7). In January 2010 negotiations on a general Association Agreement between the EU and the Republic of Moldova were launched. The association to FP7 is dealt with in the frame of the negotiations on this general association agreement. Moldova targets an association to the FP7 with effect from 1 January 2012. (See also chapters *Funding from abroad* and *Cooperation, coordindations and opening up of national research programmes within ERA*.)
Besides the multilateral EU level, Moldova has developed through the Academy of Sciences (ASM)
bilateral cooperation with several EU Member States, including Austria, Bulgaria, Czech Republic, Germany, Italy, Poland and Romania.
Secondly, cooperation in R&D is traditionally ongoing with countries of the former Soviet Union. Especially scientific cooperation with Russia, Belarus and Ukraine is institutionalised through joint funding programmes.
The third regional focus of Moldovan international R&D cooperation is the USA. Since the beginning of the 1990s cooperation is actively supported through local offices of American R&D support funds.
What concerns Transnistria, its limited R&D capacities are focused on cooperation with Russia. The Transnistrian University takes part in the Russian higher education system and has cooperation agreements with Moscow State University and other Russian universities.

# Instruments

At the multilateral level, Moldova sees the EUâ##s 7th
Framework Programme for RTD (FP7) as the main S&T cooperation instrument and requested therefore the association to the FP7 in 2008. The negotiations on the association started in January 2010 and are ongoing. Preparatory measures for the upcoming association have been taken within Moldova and cover establishing National Contact Points for the FP, awareness raising on the FP among the scientific community in Moldova and information dissemination on the opportunities offered by the FP. Moldovan organisations participate already now in the FP7 and the European programme COST having so-called â##third countryâ## status. (See also chapters Funding from abroad and Cooperation, coordinations and opening up of national research programmes within ERA.)
A second relevant multilateral forum for R&D cooperation is the Science and Technology Centre in Ukraine
. This international organisation operates with resources provided by the EU (via Europeaid), the USA and other international partners and supports R&D projects in Ukraine, Moldova and other countries of the former Soviet Union.
As with Moldovaâ##s multilateral S&T cooperation, also the bilateral one is implemented through the Academy of Sciences (ASM)
. Moldova has signed about 50 bilateral agreements, which foresee scientific cooperation (mostly in the frame of a broader cooperation approach covering fields such as economic cooperation, etc.). At the intergovernmental level there are 21 such agreements, all signed in the period up to 2003. Most of them do although not have a practical impact and remain at the level of cooperation intentions. The rest of the agreements were signed by the ASM, the majority after 2004.
On the basis of such agreements the academy has established joint R&D funding programmes with the EU Member States Germany and Romania, and a new programme is envisaged with the Italian National Research Council (CNR). Cooperation agreements are in place with a range of partner academies of sciences, which include exchange of researchers in all different scientific fields. The academy has concluded such agreements with the academies of Austria, Bulgaria, Czech Republic, Hungary, and Poland. An agreement was also concluded with the Royal Society of the UK.
Joint R&D funding programmes with countries of the former Soviet Union were established by the academy with Russia, Belarus and Ukraine. These programmes for support of R&D projects are implemented with the Russian Foundation for Basic Research
, with the Russian Foundation for Humanities, the Belarusian Republican Foundation for Fundamental Research, and the Ukrainian Ministry of Education and Science. At the same time cooperation agreements with partner academies of these countries have been concluded, and in addition with the Academy of Sciences of Azerbaijan.
Moldovan R&D cooperation with the USA is jointly funded with the US Civilian Research and Development Fund (CRDF) and its local representation, the Moldovan Research and Development Association (MRDA)

.

Further bilateral cooperation agreements are in place with academies of science of China, Montenegro and Turkey.

## Solving the Grand Challenges through Transnational R&D Cooperation

Thematic priorities at the national level and for international cooperation are defined rather broadly in Moldova. The same holds true for bilateral funding programmes, although priorities vary slightly, depending on the partner organisation. For a list of currently valid national priorities see section *Thematic R&D priorities*

.

Because of the aspirations to become associated to the EUâ##s Framework Programme for RTD (FP), the thematic priorities defined in the FP are getting increasingly important. But thematic priorities depend also on the R&D capacities available in the country, where fields like agriculture, physics, chemistry, ICT, and materials may be mentioned.

The Moldovan Government has outlined the topics energy and natural resources in its programme of January 2011, which shall be supported specifically and which are set to gain in relevance consequently. Both topics, the energy supply and usage of natural resources (e.g. through agriculture), are major challenges forMoldovawhich shall be tackled via R&D.