Information Exchange in Science and Technology between the European Research Area and Eastern European/ Central Asian Countries

ARMENIA

Country Report
(last updated February 2016, source: NAS RA)

IncoNet EaP
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General information about Armenia:

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<tr>
<th><strong>Official name of the country</strong></th>
<th>Republic of Armenia</th>
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<tbody>
<tr>
<td><strong>Population</strong></td>
<td>3,056,382 (July 2015 est.)</td>
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<tr>
<td><strong>Area</strong></td>
<td>29,743 km²</td>
</tr>
<tr>
<td><strong>Capital</strong></td>
<td>Yerevan</td>
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<tr>
<td><strong>System of Government</strong></td>
<td>Presidential Republic</td>
</tr>
<tr>
<td><strong>Head of Government</strong></td>
<td>Prime Minister Hovik Abrahamyan</td>
</tr>
<tr>
<td><strong>Education &amp; Science Minister</strong></td>
<td>Armen Ashotyan</td>
</tr>
<tr>
<td><strong>Parliament</strong></td>
<td>Galust Sahakyan</td>
</tr>
<tr>
<td><strong>Administrative structure</strong></td>
<td>11 marzes (provinces)</td>
</tr>
<tr>
<td><strong>Geography</strong></td>
<td>Armenia is a landlocked country in the Asia Minor, borders with Georgia in the North, Azerbaijan-Nakhijevan enclave in the East and South-West, Turkey in the West and Iran in the South. The terrain is mostly mountainous and flat, with fast flowing rivers and few forests. The climate is highland continental. The land rises to 4,095 m above sea-level at Mount Aragats, and no point is below 400 m.</td>
</tr>
</tbody>
</table>
Research structure

In Armenia R&D was one of core sectors of economy before the collapse of the USSR. The independent Armenia inherited quite ramified and developed network of research and education institutions distributed among Academic, university and branch/enterprise sectors. Armenia was specialised in several fields of sciences and technology, including physics and astrophysics, computer sciences and information technologies, biotechnology, chemistry and others.

The National Academy of Sciences (NAS RA) with its around 35 research institutions exists without major systemic and functional changes and is the main R&D performer in the country. It is estimated that the overall number of research institutes involved in state scientific programmes fell from 124 in 1991 to 82 in 2014. The number of R&D organisations in the country is given in Table 1.

Table 1. Number of R&D Institutions by branch subordination (1991, 2004-2006 & 2012-2014)

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<tbody>
<tr>
<td>National Academy of Sciences</td>
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<td>42</td>
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<td>17</td>
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<td>Ministry of Healthcare</td>
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<td>Ministry of Agriculture</td>
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<td>10</td>
<td>5</td>
<td>5</td>
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<tr>
<td>Ministry Economy</td>
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<td>18</td>
<td>17</td>
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<td>Ministry of Energy and Natural Resources</td>
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<td>5</td>
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<tr>
<td>Ministry of Culture</td>
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<td></td>
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<td>3</td>
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<tr>
<td>Ministry of Territorial Administration</td>
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<td>Emergency Situations</td>
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<td>Presidential Administration</td>
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<td>Government Staff</td>
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<td>Yerevan Municipality</td>
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<tr>
<td>Other</td>
<td>7</td>
<td>9</td>
<td>10</td>
<td>8</td>
<td>8</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>124</td>
<td>93</td>
<td>102</td>
<td>101</td>
<td>85</td>
<td>85</td>
<td>82</td>
</tr>
</tbody>
</table>

Source: Data of National Statistical Service of Armenia (http://www.armstat.am)
Figure 1, shows dynamics of R&D personnel through 1991-2013. Figures 2 and 3, show the dynamics of gross expenditures on research and development (GERD) in absolute values and GERD/GDP (GDP - Gross domestic product) ratio for 2004-2015\(^1\). All these comparative figures are indicative of significant downsizing of R&D intensity and input indicators in Armenia for the mentioned period. The shrinking of the R&D system was accompanied by the outflow of personnel and overall marginalisation of R&D activities.

**Figure 1.** Dynamics of R&D Total Personnel and Researchers, 1991-2013

![Figure 1](image)


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\(^1\) State Committee of Science of Armenia (http://www.scs.am)
Figure 2. Total GERD (in million AMD), 2004-2015.

Figure 3. Dynamics of GERD/GDP ratio in Armenia (2004-2014)

Source: State Committee of Science of Armenia (http://www.scs.am)
As it has been mentioned, the NAS RA institutes remain to be the main R&D performers in the country. The Academy promotes and carries out fundamental and applied research in different scientific fields, as well as coordinates basic research carried out throughout the country. In November 2006 the Armenian government adopted resolution on optimisation of the Academy infrastructure and restructuring of some of its institutes through amalgamation and creation of scientific and technological centers.

This decision was aimed at improving coordination of research activity in the institutes involved in overlapping or close research disciplines, more efficient use of scarce financial resources and promoting commercialisation of research outcomes. For example, Scientific & Technological Center of Organic and Pharmaceutical Chemistry were created through amalgamation of the Institute of Fine Organic Chemistry, Institute of Organic Chemistry and Molecule Structure Research Center.

Recently, NAS established a set of innovation support activities, including:

- A Science Development Foundation was established to support research activities with innovative potential, commercialisation of research outcomes and infrastructure modernisation;
- A set of innovative research projects has been compiled for submission to Government;
- Plans to establish a technology transfer office to support commercialisation and technology transfer;

Excluding the 35 institutes in the NAS system, 47 institutes fell under the branch ministries and private organisations.

Armenia has a well-established system of tertiary education that includes 26 state universities, 37 private universities, four universities established under intergovernmental agreements and nine branches of foreign universities. Universities have a high degree of autonomy in formulating curricula and setting tuition fees. Armenia joined the Bologna Process in 2005, and universities are currently working to align the standards and quality of their qualifications. However, the research intensity in most of the universities is very low and mainly state owned and foreign universities have research departments.

During the last years the Government has been supporting several so-called “system-forming” regional scientific-technological projects with main objective of attaining scientific excellence, strengthening international networks and regionalisation of scientific-technological activities focusing on innovation-related aspects. The most ambitious project is the CANDLE - Center for the Advancement of Natural Discoveries using Light Emission, seeking to establish a third generation synchrotron light source for basic, industrial and applied research in biology, physics, chemistry, medicine, material and environmental
sciences. The Center for Radiation Medicine and the Armenian Center of Excellence in Oncology are other projects seeking to build scientific potential.

At present there are three main public R&D funding mechanisms in Armenia implemented via State Committee of Science of the Ministry of Education and Science of Armenia, as follows:

- basic funding;
- thematic (project based) funding;
- targeted research projects funding;

The thematic funding was introduced in the 1990s, directed to reduce overlap between research teams and projects, stabilize and re-orient the science system, and increase the efficiency. Thematic funding was supplemented by the introduction of basic funding in 1998, and targeted research projects' financing mechanism since 2002.

The Gross Domestic Expenditure for R&D in 2015 totaled to around 14 billion AMD (around 25 mln. Euro) in Armenia. Currently accounting for 73% of the total science budget, basic funding is the most significant mechanism of funding of basic and applied research for different groups of institutes in the country. The share of Targeted Projects Programme currently amounts to around 13% of the total science budget. A key objective of the programme is to support innovative projects and strengthen research commercialisation, with private companies often involved.

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Research policy

It is widely accepted fact that at the current stage of the development of the society research, development and innovation (RDI) can become determining factors for sustainable economic development, increasing the country’s competitiveness in international market and key to solving many social problems. But in the early years of transition, the Armenian government, in condition of drastic economic crises, ethnic conflicts in the region, and social transformations, was not eager and in no position to formulate and enforce adequate S&T policy. The efforts of the scientific community were mainly directed to solving arising problems and preserve as much of the inherited from the former USSR R&D potential as possible. Thus, it can be stated that until the late 1990s, the matter of S&T policy-making and priority setting was not a major concern of the political actors in Armenia. During those years the RTD sector has been existing or better say “surviving” in the country by itself with very weak links and hardly any contribution to development of national economy.

The only major step in S&T policy during the early 1990s, was the government decision to implement thematic (project based) financing of science.

There were also several unsuccessful attempts of creating science and technology council subordinated either to the president or prime minister.

In December 2000, the Armenian Parliament adopted the Law on Scientific and Technological Activity aiming at regulating interrelations between R&D performers, state bodies, and R&D outcome consumers, as well as outlining general principles of formation and implementation of state policy in the field of S&T. The Law prescribes the Ministry of Education and Science (MES) as state authorised body to develop and coordinate S&T policy-making.

By government resolution as of September 2006, the Ministry of Trade and Economic Development (currently: the Ministry of Economy) was recognised as authorised body responsible for development and implementation of innovation policy, in co-operation and coordination with other concerned ministries and organisations. The aforementioned situation was indicative of fragmented character of policy-making in S&T and innovation, and poor interlink and cooperation between these organisations.

To improve the policy-making and better coordination in the field of S&T, in October 2007 the government made a decision on creation of the State Committee of Science empowered to carry out integrated S&T policy in the country. This structure is subordinated to the Ministry of Education and Science, but with wider power of independent activity. The Committee is also responsible for development and implementation of research programmes in the country through three main financing mechanisms: thematic (project based) financing, basic financing and targeted research projects.
During this period several other governmental acts and decisions have been adopted directed to regulation of S&T and innovation policy in the country.

In May 2001, the government approved the concept on development of information technology industry in Armenia. It emphasizes the existence of adequate potential in the country for development of IT sector, and need for further improvement of infrastructure and legislation supporting development of IT industry.

The law on the National Academy of Sciences of Armenia (NAS RA) was adopted by the Parliament on 14 April 2011, which assigned a status of highest self-governing state organisation with special status to the Academy empowered to coordinate and carry out basic and applied research directed to the creation of a knowledge-based economy, and social and cultural development of the country. This Law gave more power to the Academy and its research institutes in carrying out business activities towards the commercialisation of R&D outcomes and the creation of spin-offs.

In May 2010, the Government adopted the Strategy on Development of Science in Armenia, which outlined the state policy towards development of science in 2011-2020. Based on this strategy, the Action Plan 2011-2015 was approved by the government in 2011 on the development of science in Armenia which incorporates the following targets for the stated period as follows:

- Improving the S&T management system and ensuring adequate conditions for the sustainable development;
- Measures on increasing the number of young and talented specialist involved in research, education and technological development, upgrading of research infrastructure;
- Creating adequate conditions for the development of integrated science, technology and innovation system
- Developing international cooperation in RTD.

One of the main positive aspects in the latest adopted policy documents is the existence of quantitative targets to measure the success of implementation of envisaged measures.

In December 2014, the Government approved new science and technology development priorities for 2015-2019 which are stated to be:

- Armenian Studies
- Life Sciences
- Secure and Efficient Energy
- Key Enabling Technologies, Information and Communication Technologies
- Space, Earth Sciences, Sustainable Use of Natural Resources
- Basic Researches for Key Problems of Scientific and Socio-Economic Development
However, the government decision doesn’t specify additional measures or mechanisms to channel additional support or funds for development of priority research areas.  


The new Statute of the National Academy of Sciences of Armenia was approved by the government in May 2011, based on the Law on the National Academy of Sciences of Armenia, allowing the Academy to carry out wider business activities towards the commercialisation of R&D outcomes and the creation of spin-offs.

In addition to horizontal innovation and science policies, the Government strategy includes focusing support schemes on selected industries. Within this context, since 2011 the State Committee of Science has started a programme inviting private sector participation on a co-financing basis in research projects targeting applied results. Within this programme projects have been funded in the field of pharmaceutics, medicine and biotechnology, agriculture modernisation and machine building, electronics, engineering, chemistry and ICT.

During the last years a few private initiatives have also been launched, e.g. Technology Transfer Association, Viasphere Technopark and IT park in Yerevan, etc.

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3 State Committee of Science, http://www.scs.am/
International co-operation in research, science and technology

Integration into international scientific and technological system is one of the priorities of Armenia stated in the Law on Scientific and Technological Activity. During the years of independence certain steps have been undertaken towards enhancing international S&T cooperation. On the intergovernmental level during 1991-2005 S&T and/or cultural cooperation agreements were signed with around 20 EECA and EU-member states, including France, Greece, Romania, Slovakia, Bulgaria, Cyprus, Portugal, Poland, UK, Russia, Ukraine, Belarus, Georgia, Kyrgyzstan, Tajikistan and Turkmenistan. During this period S&T and/or cultural cooperation agreements were also signed with Argentina, China, India, Iran and the USA. In 1992 the National Academy of Sciences of Republic of Armenia (NAS RA) joined the International Council for Science (ICSU). NAS RA is also a member of the InterAcademy Panel on International Issues, International Association of Academies of Sciences, and Council of Academies of Sciences of BSEC Countries.

The State Committee of Science of Armenia and CNRS (France) signed a bilateral cooperation agreement in January 2009. The agreement provides framework for exchanging scientists of the two countries, implementation of joint scientific and research programmes, organisation of joint scientific conferences and seminars. The joint programme is implemented with the contributions of the two sides. In the framework of this cooperation in November 2010 a trilateral agreement on the establishment of joint laboratories was signed between CNRS, the National Academy of Sciences and the State Committee of Sciences. Up to now, three laboratories were established in the fields of geological sciences, archaeology and physical research.

Bilateral S&T cooperation programmes are underway also with Russia, Germany and Belarus.

NAS RA has cooperation agreements with the Academies of Sciences of Russian Federation, Belarus, Ukraine, Turkmenistan, Georgia, Hungary, China, Romania, Moldova and Memorandum of Understanding with Indian National Science Academy.

Since 2004 Joint Research Expedition on hydro-ecological investigation of Lake Seven has been launched jointly with the National Academy of Sciences of the Russian Federation.

The Joint Scientific Experimental Centre (JSEC) operates at the Institute of Zoology of NAS RA opened jointly with the Centre of Zoology and Hydro-ecology of NAS RA and the Centre of Parasitology within the A.N. Severtsov Institute of Problem of Ecology and Evolution of the Russian Academy of Sciences.

Alikhanyan National Science Laboratory (Yerevan Physics Institute) is involved in several large scale international experiments in the field of High energy physics, Cosmic ray physics and High energy astrophysics in close cooperation with Conseil Européen pour la Recherche Nucléaire, CERN (Geneva, Switzerland), Thomas Jefferson National Accelerator Facility (Newport News, USA), Deutsches Elektronen-Synchrotron (Hamburg, Germany),
Max-Planck-Institut für Kernphysik (Heidelberg, Germany), Max-Planck-Institut für Physik (München, Germany), Karlsruhe Institute of Technology (Karlsruhe, Germany), Lebedev Physical Institute and Moscow State University (Moscow, Russia), etc.

Being among leading universities of Armenia Yerevan State University, State Engineering University of Armenia, and Yerevan State Medical University maintain wide international cooperation within cooperation agreements in the field of education and research with various universities and research centres of more than 30 countries of the world, including Russia, Great Britain, France, Italy, Germany, Greece, Spain, Sweden, Japan, China, USA, and others.

In 1999, Armenia and European Union signed the Partnership and Cooperation Agreement, which serves as legal basis for development of cooperation including in the field of S&T. New prospects for closer EU-Armenia cooperation were opened after inclusion of Armenia in the European New Neighbourhood Policy (ENP) Initiative and further development of the ENP Action Plan aiming at contributing to sustainable economic development of the country. The ENP Action Plan includes the article on measures in the field of S&T incorporating points towards assisting in development of adequate S&T and Innovation policy system reformation activities and creation of independent peer-review structure for competitive selection of RTD projects in Armenia. It also contains an article stating the need for closer integration of Armenia into European Research Area through more active promotion of participation of Armenian research organisations in EU’s Framework Programmes.

Inclusion of Armenia in the EU’s new Eastern Partnership Initiative officially launched in May 2009 adds a new multilateral framework for EU-Armenia relations in various fields of science and technology.

The Strategy on Development of Science 2011-2020 sets ambitious targets for international scientific cooperation – including, by 2020, that Armenia will have a knowledge-based economy, be competitive within European Research Area in terms of fundamental and applied research, and be a prime location for scientific specialisation within ERA. The Strategic Action Plan for the Development of Science for 2011-2015 includes objectives for the general development of international RTD cooperation, to set up programmes for cooperation, to establish joint laboratories and research centres, and to attract foreign researchers to collaborate with Armenian colleagues.

The State Committee for Science reports that about 60% of co-publications of Armenian researchers are with colleagues from the EU, in particular from Germany, France and Italy. Other important publication partners include the USA and Russia.
GERD financed from abroad fluctuates significantly from year to year, and has ranged between 1.7% in 2008 and 11.7 in 2010. In 2011 the 3.4% GERD financed from abroad was in absolute figures equivalent to 887 thousand USD.

The major source of foreign funding for research in Armenia is the International Scientific & Technological Centre (ISTC). Since 1994 up to July 2014 173 ISTC projects with participation of Armenian teams were funded with around 42.25 mln. USD total funding.

During 1994-2004, 162 Armenian research teams received more than 2.8 mln. Euro grants within the framework of programmes of the International Association for the promotion of co-operation with scientists from the New Independent States of the former Soviet Union (INTAS). In 2002-2007 Armenia received the total of 602 043 EUR of funding for the research projects within INTAS Open and Thematic Calls. During the same time span Armenian young researchers received individual grants for 186 250 EUR within INTAS Young Scientists Fellowship Programme. In 2006, joint INTAS-South Caucasus Collaborative Call was launched on co-funding basis with 1.9 million Euro total budget within the framework of which 9 Armenian teams were granted more than 430,000 Euro.

The main programme for research and innovation cooperation with the EU is the Framework Programme for Research and Development, which is also the largest international R&D and innovation cooperation programme in which Armenia can participate. Within 2007-2013, Armenian institutions were present in around 200 submitted project proposals within FP7 out of which 47 were successful with more than 3.2 mln Euro funding allocated to Armenian participants. Most participants were funded under the FP7 subprogrammes International Cooperation (15 projects), the International Research Staff Exchange Scheme (8), Infrastructure (6), ICT (5), and Nanosciences, Nanotechnologies, Materials and New Production Technologies (3).

In July 2013, Armenia officially expressed interest in becoming associated to the next EU Programme, HORIZON2020 (2014-2020), and it is planned that the agreement will be signed by February 2016.

According to statistics as of June 2015, Armenian organisations were present in around 30 eligible proposals submitted for H2020 calls for proposals, out of which 8 were retained for funding with around 1.0 mln. euro total EU funding.

As of May 2013, Armenian teams have been participating in four European Cooperation in Science and Technology (COST) initiatives.

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Other important international sources of funding are the US Civil Research and Development Foundation and National Foundation of Science and Advanced Technologies (until 2004, 235 grants with $4.3 mln. total cost), and NATO Science programme, particularly for infrastructure and equipment upgrading.

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