Co-funded by the
Erasmus+ Programme
of the European Union

MENVIPRO

Modernization of Environment Protection Studies Programmes for Armenia and Georgia

(598232-EPP-1-2018-1-IT-EPPKA2-CBHE-JP)

SWOT ANALYSIS

ENVIRONMENTAL EDUCATION IN ARMENIA

Yerevan 2019

TABLE OF CONTENTS

1. Project Background

Project number: 598232-EPP-1-2018-1-IT-EPPKA2-CBHE-JP

Project acronym: MENVIPRO

Duration: 36 months (2018-2021)

Applicant (Coordinator): Università Degli Studi Della Tuscia – Italy

Programme Countries

- Consiglio Nazionale Delle Ricerche – Italy
- Giraf Pm Services Gmbh – Germany
- Martin-Luther-Universitaet Halle-Wittenberg – Germany
- Universidade De Lisboa – Portugal

Partner Countries

Armenia

- Center for Ecological-Noosphere Studies of NAS RA
- National Academy of Sciences of the Republic of Armenia represented by International Scientific-Educational Center of NAS RA (ISEC NAS RA)
- Gavar State University (GSU)

Georgia

- Georgian Research and Educational Networking Association (GRENA)
- Ilia State University (ISU)
- The University of Georgia (UG)

Project Summary

The overall objective of the project is to significantly improve the quality of MSc. studies in the field of Environment Protection in Armenia and Georgia on the basis of complex modernization of the curricula in line with the Bologna principles, Salzburg principles of EAU and best European practice. The curricula development will be firmly based on the analysis of the best practice obtained in Europe, target countries and beyond and incorporate the latest innovations in educational technologies. The focus will be on close relations between

postgraduate studies and research activities in order to equip the graduates with cutting edge knowledge and practical skills. University-society-industry links will play also a key role to guarantee high employability of graduates. In order to radically modernize the MSc. education in EP – technology-intensive domain of knowledge, the project will establish a unique inter-University education and research facility, which will be used for student projects, collaborative projects with external stakeholders and demonstration activities to reinforce links to the University environment and promote environment-friendly mindsets. The ERLEP will represent one of the major tangible outcomes of the project and will define the quality standards of postgraduate studies in the field of EP for many years. Moreover, the ERLEP will provide the access to a modern laboratory infrastructure and enable various projects between Universities and external stakeholders.

2. General Political and Socio-Economic Climate

General political and socio-economic climate in the target countries for modernization of postgraduate studies in the field of EP on the basis of the Bologna declaration. Please provide also facts & figures, e.g. information on financing of HEIs, trends and Please write ½ page on it and extract threats/opportunities.

Following an initial spike in early 2018, Armenia's economic performance slowed during the rest of the year, mostly due to weakening external conditions, the lower execution of public capital expenditures, and slowing investment. Still, the economy expanded at a robust 5.2 percent for the year. Although larger economic disturbances were avoided during the political transition after the December 2018 parliamentary elections, the associated uncertainty may have weighed on economic sentiments.

Two consecutive years of solid growth and low inflation contributed to an improvement in living conditions. The national poverty rate declined from 29.4 percent in 2016 to 25.7 percent in 2017. The economic growth in 2017 translated into higher consumption levels for those at the bottom 40 percent of the distribution, breaking the pattern observed in 2011- 2016, when growth largely benefited the upper deciles only[1].

There is a strong link between the achievement level of students and their family background. The share of students with excellent scores from the impoverished families is 34.3% compared to that of 42.8% of children from more affluent backgrounds. The trend appears to remain constant as students' transition from primary to upper secondary levels, and tends to worsen[2].

Despite pretty high gross enrollment rate in higher education (51% in 2016), the participation rates based on the family financial characteristics and geographical location suggest that the transition chances into tertiary level for the economically poor population appear to be skewed (PL4SD, 2015). The relative equity gap between the poor and non-poor groups continues to exist and grows bigger. Over 2010-2015, the enrollment rate for the non- poor families was 44%, compared to 25% for the poor and 10% for the extremely poor (PL4SD, 2015).

The chances for the transition into tertiary level for the children from socio-economically vulnerable families get further skewed both in terms of their academic preparation necessary for the university exams and their financial barriers to supplementary tutoring. The findings of the study suggest a correlation between the family wealth and the intention to pursue the studies to tertiary level (84.2% of well-off families, cf. with the 51% of non-rich). The number is also higher among urban parents (64.2%), compared to rural parents (54.7%).

[1] http://www.worldbank.org/en/country/armenia/overview
[2] http://www.osf.am/wp-content/uploads/2018/10/EquityReport_OSFA_2016.pdf

Even though higher education has grown and demand for it remains strong among families and youth, the sector is currently contracting and undergoing consolidation. This is primarily due to demographic shifts, including population decline, high levels of outmigration, and new regulations of private higher education institutions. Between 2009 and 2018, the sector's student population decreased by 31 percent, and 16 universities (out of 77) had to close their doors. Additionally, in 2010 the government introduced a regulation whereby private university applicants (like their public university counterparts) had to sit for admission examinations. This step reduced the number of applicants gaining admission to private higher education institutions. The introduction of an accreditation process and the failure of some universities to fulfill licensing procedures caused further closures. Despite this decline, universities are not systematically reaching out to new groups, and inequality remains substantially high in the sector. Between 2004 and 2013, inequality by family background in access to higher education remained unchanged, despite expansion throughout that period3. Table 1 illustrates the changes in the student, faculty, and institutional population between 1991 and 2018[4].

Table 1: *Trends in the number of higher education institutions, students, and faculty in Armenia, 1991–2018*

	1991	1997	2009	2018
Number of higher education institutions	14	102	77	61
Number of Students	66,079	56,154	114,629	78,747
Number of Professors	N/A	8,303	12,196	10,937

Source: Armstat. Statistical Yearbooks 1991-2018.

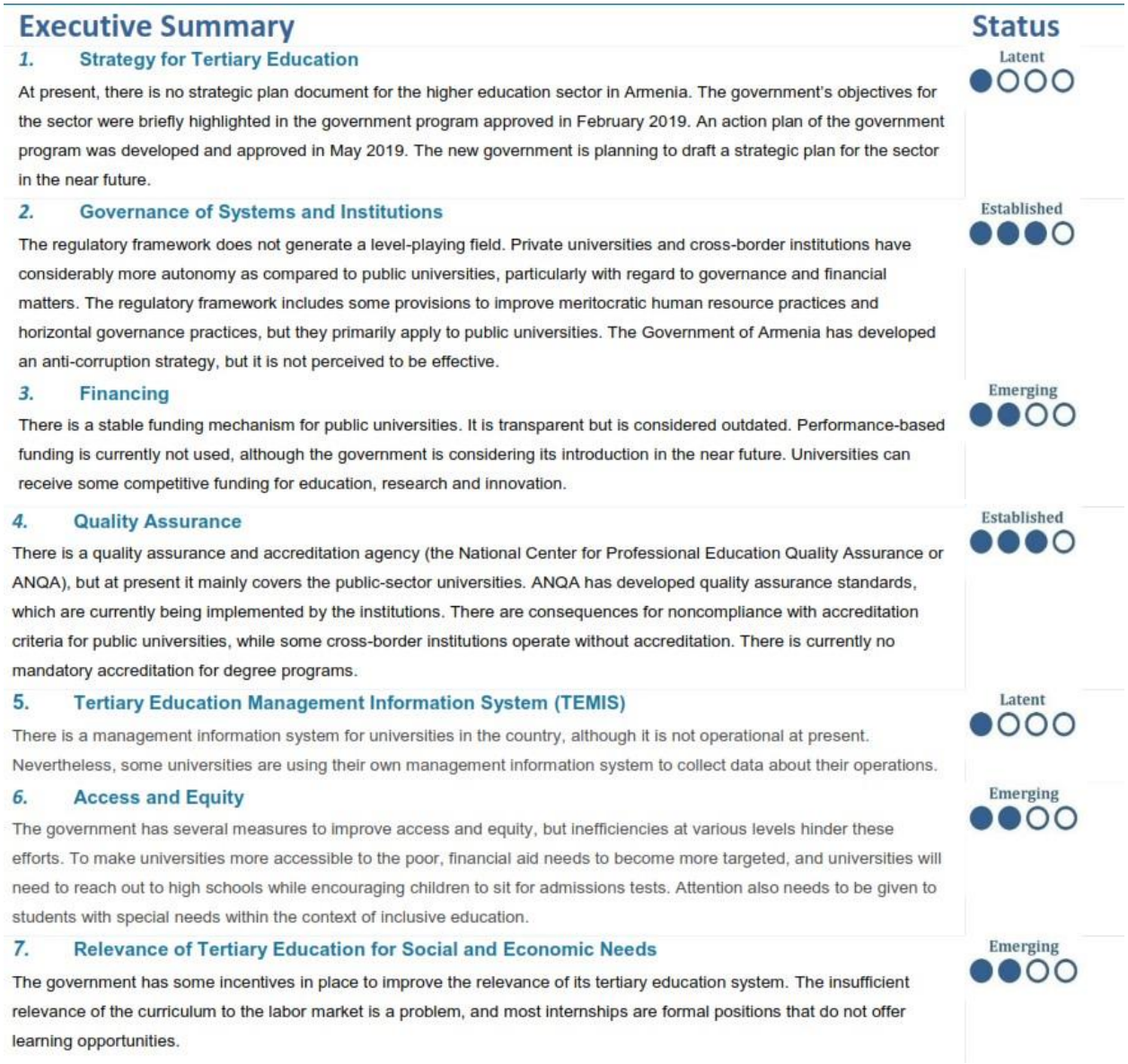
The statistical analysis[5] of the admission figures for 2017-2018 academic year in all HEIs in Armenia shows that Environmental Sciences are among the professions with the lowest demand and lowest admission figures with evident dominance of humanities and social sciences.

[3] K. Geven, Inequality in Armenian Higher Education, 2004-2013, Working Paper (2014)

[4] Armstat. 2018. Social Snapshot and Poverty in Armenia 2018
https://www.armstat.am/file/article/poverty_2018_english_4.pdf

[5] https://www.armstat.am/file/article/sv_03_18a_5190.pdf

According to the Saber Tertiary Education Country Report: Armenia 2019[6], aims to help the government of Armenia and its stakeholders develop a strategy for the tertiary education sector, It uses the methodology of SABER – Tertiary Education (SABER-TE), which is a diagnostic tool to assess how education systems perform and to identify priorities for reforms at the national level. The methodology and this report are part of the World Bank's Systems Approach for Better Education Results (SABER), which benchmarks education systems at the country level. The executive summary is presented below:



Executive Summary

Status

1. Strategy for Tertiary Education

Latent

At present, there is no strategic plan document for the higher education sector in Armenia. The government's objectives for the sector were briefly highlighted in the government program approved in February 2019. An action plan of the government program was developed and approved in May 2019. The new government is planning to draft a strategic plan for the sector in the near future.

2. Governance of Systems and Institutions

Established

The regulatory framework does not generate a level-playing field. Private universities and cross-border institutions have considerably more autonomy as compared to public universities, particularly with regard to governance and financial matters. The regulatory framework includes some provisions to improve meritocratic human resource practices and horizontal governance practices, but they primarily apply to public universities. The Government of Armenia has developed an anti-corruption strategy, but it is not perceived to be effective.

3. Financing

Emerging

There is a stable funding mechanism for public universities. It is transparent but is considered outdated. Performance-based funding is currently not used, although the government is considering its introduction in the near future. Universities can receive some competitive funding for education, research and innovation.

4. Quality Assurance

Established

There is a quality assurance and accreditation agency (the National Center for Professional Education Quality Assurance or ANQA), but at present it mainly covers the public-sector universities. ANQA has developed quality assurance standards, which are currently being implemented by the institutions. There are consequences for noncompliance with accreditation criteria for public universities, while some cross-border institutions operate without accreditation. There is currently no mandatory accreditation for degree programs.

5. Tertiary Education Management Information System (TEMIS)

Latent

There is a management information system for universities in the country, although it is not operational at present. Nevertheless, some universities are using their own management information system to collect data about their operations.

6. Access and Equity

Emerging

The government has several measures to improve access and equity, but inefficiencies at various levels hinder these efforts. To make universities more accessible to the poor, financial aid needs to become more targeted, and universities will need to reach out to high schools while encouraging children to sit for admissions tests. Attention also needs to be given to students with special needs within the context of inclusive education.

7. Relevance of Tertiary Education for Social and Economic Needs

Emerging

The government has some incentives in place to improve the relevance of its tertiary education system. The insufficient relevance of the curriculum to the labor market is a problem, and most internships are formal positions that do not offer learning opportunities.

[6] http://documents.worldbank.org/curated/en/311701571813535701/Saber-Tertiary-Education-Country-Report-Armenia-2019

Funding System of HEIs in Armenia

Public educational institutions in Armenia receive an input-based state funding from the state budget via annual block grant, whereas private educational institutions do not receive any public funding. The state funding of Higher Education in RA is based on the number of the enrolled students. Government expenditures on Higher Education have increased 1,9 times – from 5,3 billion AMD (about 12.2 ml. USD) in 1996 to 10,2 billion AMD (about 21.6 ml. USD) in 2014. In 2014, HE shares in the total government expenditure was 0,82 % and 7% in the total education expenditures, which formed about 0,2% of GDP. State expenditures on HE is almost entirely spent on student scholarships. Only up to 20% of all students in Armenia get state support for their tuition fee payments in forms of full or partial tuition fee waivers (through state scholarships). 15,7% of students received state scholarships in 2012-13 academic year. This is substantially less than in other OECD countries, including those which are the closest to Armenia in terms of enrollment and tuition fee size (at least 40% in the 4th group of countries 1). The rest of the universities' budget is essentially made up of income proceeding from the tuition fees. The block grant is fully directed to teaching activities. The funding for research purposes is distributed on a competitive basis[7].

State institutions receive state financing, which cover partially their expenses. Another part comes from the fee-paying students. The number of state-commissioned students is very restricted, if any (this procedure is both merit-based and need-based) for certain bachelor professions. The students who demonstrate academic honor have a chance to get their education free-of-charge.

Tuition fees are paid by nearly all students in private institutions regardless of their social or financial status, and at some of them the institutions cover the expenses of some academically advanced students.

In 2016 the Government of Armenia assigned the Ministry of Education and Science of Armenia to study the possibility of setting up endowment foundations to foster the financial sustainability of the higher education institutions in the country.

According to the requirements of the provision of state scholarships and student allowances in higher educational institutions of the Republic of Armenia, a full or partial waiver was set (ranging between 50-100%) to cover the tuition fees for students from socially disadvantaged families and living in border and high-altitude settlements. In 2018, tuition waivers were provided for 3,300 students, and the amount of compensation was about 700 million AMD[8].

[7] https://eacea.ec.europa.eu/sites/eacea-site/files/countryfiches_armenia_2017.pdf
[8] https://supporthere.org/page/higher-education-armenia

In Armenia both public and private HEIs are autonomous and are free to set their own tuition fees. Around 15-20% of all student places is non-fee-paying places. The tuition fees differ from institution to institution and also in specializations within the same institution. International students pay different fees than national students.

The Government introduced a cap system on the fees with an effort to keep access to HE wide. The caps are applied to all HEIs irrespective of their public or private status. They are defined by institutional accreditation results and differ per education level (Bachelor's, Master's).

The financial support to learners in Armenia is provided in form of allowances, scholarships and loans. The financial support can be granted to students based on the need, on the merit or on the need and merit simultaneously.

Student allowances

The state provides full compensation for the tuition fees in form of student allowances to the following categories:

- those who obtained the highest grades at examinations and tests during one academic year;
- those who belong to several disadvantaged social groups, such as students left without parental care, disabled persons, children of the deceased military servants, etc.;
- those who were admitted to the specialties of a state priority.

A partial compensation (50-100% of tuition fee) in form of student allowances is provided to those who pass the minimum threshold of average qualitative score and those who belong to the vulnerable groups registered in the government system. HEIs might also partially compensate the tuition fees in forms of student allowances based on students' socio-economic conditions and high academic performance.

Student scholarships

The Government of RA awards scholarships to students with an advanced and high academic performance. Irrespective of the form of study, the state also provides yearly lump sum academic scholarships (around 23.000 EUR in total) to around 40 best students (with a range of 450-850 EUR per student).

Student loans

The Government of RA has introduced a state-supported student loan scheme to the economically disadvantaged students of public or private accredited universities or accredited programmes. Students can receive a loan based on their academic performance or socio-economic status. Students are obliged to return the loan within 10 years period with an interest rate of 12%. It is partially subsidized (2-3%) by the Government depending on the student's performance. The estimated loan per student is 3.500 EUR at maximum for the

whole period of study. Students receive the loan for four consecutive years and the yearly loan installment per student is 885 EUR at maximum.

STRENGTHS	WEAKNESSES
• Very slow but gradual reduction in the poverty; • Availability of the allowances, scholarships, tuition fee waivers, discounts of tuition fee and tuition fees; • Availability of governmentally funded places for students in the natural sciences.	• Disinterest of students to continue and pursue their education in the second and third levels of education as soon as they find a job in the labour force; • Non-availability of highly-paid jobs in the labour market in the environmental sciences (except for international organizations); • Humanitarization of the education (dominant number of students are in the humanities and social sciences); • Lack of advertising and promotion of the Environmental education among wider ranges of societies for awareness-raising purposes; • Most places at the universities are based on tuition fees; • Transition chances into tertiary level for the economically poor population appear to be skewed (PL4SD, 2015). The relative equity gap between the poor and non-poor groups continues to exist and grows bigger. Over 2010-2015, the enrollment rate for the non-poor families was 44%, compared to 25% for the poor and 10% for the extremely poor (PL4SD, 2015).
OPPORTUNITIES	**THREATS**
• Expansion of international mobility, exchange programs; • Opportunityof involvement in international and national research projects;	• Continuous decrease in the number of students in the natural sciences; • Migration of population for different reasons;

• Comparatively low tuition fees for the students in the natural sciences; • Opportunity of involvement as a junior researcher in the course of their studies (refers to mostly NAS RA).	• Disinterest of students to do Master's/PhD in environmental sciences because of low salaries and limited number of working places in the job market.

SALZBURG PRINCIPLES

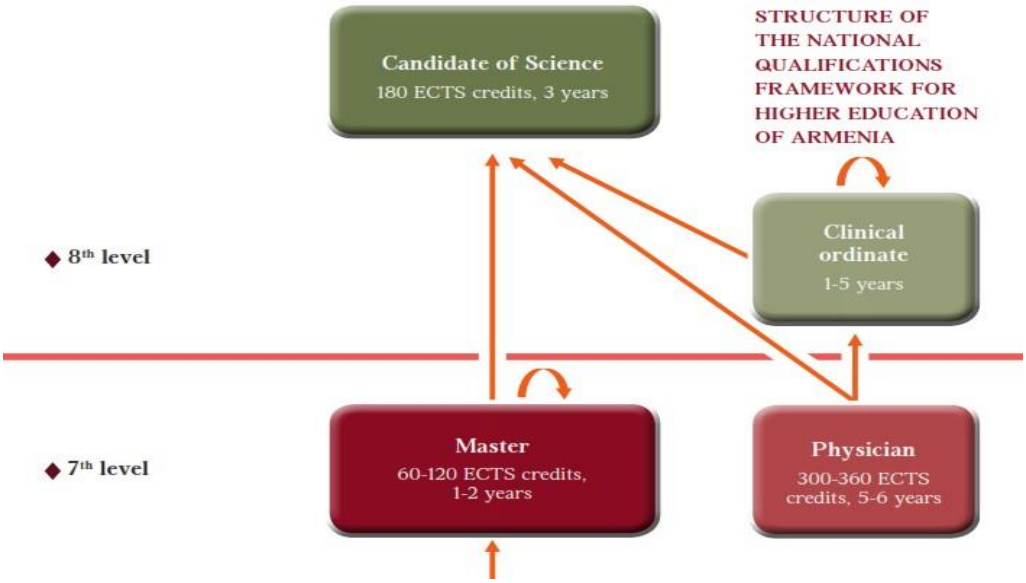
What about the compliance of the PhD education to Salzburg principles, within the frames of a three-year 'Structural Development of the Third Cycle Based on Salzburg Principles' project funded by TEMPUS, ISEC has carried out the SWOT analysis of the PhD education in Armenia and their compliance to the Salzburg principles. The findings of the SWOT analysis for NAS RA are available at: https://www.isec.am/images/veritas/NASRA- SWOT_English.pdf Moreover, the results of the fact-findings were analyzed by the National Centre for Professional Education Quality Assurance Foundation (ANQA)[9] and Education Quality (EQ) representatives. Later on ANQA organized focus group discussions among the partner institutions to summarize the results, to discuss the major lines, to unify the general approaches and perspectives and to come up with the recommendations on the quality enhancement of the doctoral education in Armenian and developed a set of recommendations for the alignment of the Armenian doctoral education to the Salzburg principles based on the results of the fact-finding process. The proposed recommendations can serve as a basis for the quality enhancement of the Armenian doctoral education in compliance with the Salzburg Principles.

[9] http://www.anqa.am/en/publications/salzburg-principles-state-of-arts-in-the-republic-of-armenia/

3. Regulatory Frameworks

Regulatory frameworks (national laws, standards, institutional regulations, etc.) their relation to the Bologna principles. How accreditation of educational programmes is regulated. Please write ½ page on it and extract threats/opportunities

With its resolution N 714 – dated on 7 July 2016, the Government of RA adopted the current version Armenian National Qualifications Framework (ANQF) for 3 levels of Higher Education after several amendments and the challenges, it faced[10].



[10] https://www.arlis.am/documentview.aspx?docid=107371

EDUCATION LEVEL (QUALIFICATION)	1ST (BACHELOR)	2ND (MASTER)	3RD (CANDIDATE OF SCIENCE)
General description (characteristic) of the Qualification	• The first level degree qualifies individuals who have broad and coherent knowledge and skills in a range of fields to undertake professional work and/ or further learning.	• The second level degree qualifies individuals who have advanced and specialised knowledge and skills in the given field for professional practice, research and/ or further learning.	• The third level degree qualifies individuals who have systematic and critical understanding and specialised research skills in one or more complex fields of scholarship or professional practice for advancing and/ or creating new knowledge.
KNOWLEDGE			
1. **Knowledge and understanding**	• Demonstrates advanced knowledge and understanding of basic and state-of-the-art concepts, theories and methods within the field of professional work or study.	• Demonstrates profound professional knowledge, including on the recent achievements of the field, which applies for study, work and research.	• Demonstrates advanced knowledge specific to the specialty area and related intersecting fields, which applies in scientific research and professional work.

EDUCATION LEVEL (QUALIFICATION)	1ST (BACHELOR)	2ND (MASTER)	3RD (CANDIDATE OF SCIENCE)
		• Demonstrates deep understanding of theories, advanced concepts and methods of the given specialty and at the interface between different fields.	• Demonstrates comprehensive and deep understanding of state-of-the-art theories, approaches, new hypotheses and scientific-research methods specific to the specialty area and related intersecting fields.
SKILLS			
2. **Applying knowledge and understanding**	• Can apply acquired knowledge and understanding, basic principles and methods of the field for solving problems during the professional work or study.	• Can apply acquired knowledge and understanding, advanced principles and methods of the specialty area and/or related intersecting fields to solve complex theoretical and practical problems in new and unfamiliar situations, and to implement research and innovative activities.	• Can apply acquired knowledge and understanding, conceptual principles and advanced methods of the field to plan and conduct scientific-research activities and to give innovative solutions to the complex theoretical and practical problems.

Taken from:
http://armenqa.am/wp-content/uploads/2017/06/Level-Qualification- Descriptors-of-the-National-Qualifications-Framework-of-Armenia.pdf

Higher education reforms which have actively started after Armenia's joining the Bologna process in 2005, and primarily refer to the improvement of the quality of academic programmes.

Major reforms in higher education and research will be conducted from 2019 and the strategy draft will be developed.

At the moment, the following milestone documents shall be taken into consideration:

- The draft law "On Higher Education" has undergone an amendment leading to a new edition of the law on "Higher Education and Science" in the form of a single legislative document;
- Strategic Perspective Development Program of the Armenian Government from 2014 to 2025[11];
- Governmental program for 2018-2022[12];
- Strategy on Development of Environmental Education and Upbringing adopted in 2018[13][14].

In terms of higher education, the Strategy on Development of Environmental Education and Upbringing envisages the revision of curricula, syllabi, textbooks and other educational documentation and the implementation of the standardization process. In order to achieve this aim, the strategy prioritized collaboration with the HEIs, research centers and industrial companies in order to establish relevant technical and material bases, labs and experimenting stations, to ensure CDP of the academic and administrative staff, to ensure the access to professional literature, information at national and international levels, to ensure interdisciplinary approach to teaching and multilateral partnership ties with international bodies, state and local government bodies, academia, HEIs, private sector, mass media and NGOs. The strategy also envisages to specify the scope of research in line with the priorities of the policy, global and local issues and commitments undertaken by the international conventions as well as to introduce mechanisms of promoting orders on research, analysis and forecasting by the public and private sectors to the research centers. Nevertheless, as there is no specific funding allocated for the implementation of the aforementioned priorities, the risks are high that all these will be on paper.

Education Development State Programme of the Republic of Armenia 2011-2015[15]

1. The National Assembly approved this programme through a law adopted on June 23, 2011. It is the public policy in Armenia in the area of education and regulated by the Law on Education of the Republic of Armenia. It is based on previous programmes and concepts approved by the government, including the concept "Education – 2015" developed with the support of the United States Agency for International Development (USAID).

11 https://www.gov.am/files/docs/1322.pdf
12 https://www.gov.am/files/docs/2920.pdf
13 http://www.irtek.am/views/act.aspx?aid=93900
14 http://www.irtek.am/views/act.aspx?aid=93901
15 https://www.arlis.am/DocumentView.aspx?DocID=63488

2. It contains a review of the current situation and on this basis, the programme stated three main objectives:

- Improve the accessibility of education at all levels; create equal opportunities for everyone to receive education of the highest quality consistent with his/her preferences and capabilities;
- Improve the quality of education bringing it in line with the international standards, ensuring the satisfaction of the society and business community with the quality of provided educational services;
- Provide a continuous growth and effective implementation mechanisms for the funds coming from the state budget.

There are other law regulating the sphere of education but they are not relevant to the EP and postgraduate education such as:

Law "On Ecological Education of the Population" (2001): According to the Law, environmental education should be provided to the person during his/her whole lifetime, starting from childhood till the age of maturity for formation of environmental outlook and understanding to participate in the process of environmental protection and conservation. It is also stated that "*The formation of person's ecological culture should necessarily contribute to sustainable development …*". Of particular interest in the law are specific provisions on what it terms "*extramural environmental education and training*" (*Art. 20(1)*), which lays the legal basis for non-formal learning activities for environmental literacy.

Law on General Education (2009): Art. 5(2)

Law on Higher and Postgraduate Education (2004): This Act is silent on the issue of environmental education, it addresses only certain aspects of lifelong learning (see Art. 3, 6(5), 7, 8(4)), which may cover environmental issues.

Accreditation Process in Armenia

The National Centre for Professional Education Quality Assurance Foundation (ANQA) was established in 2008 to signify the importance of the internationalization of the quality assurance procedures globally and to put into practice for the Armenian higher education the standards recognized and cultivated in the education systems in Europe. The main responsibility of the structure is to maintain the quality assurance assessment and the institutional and programme accreditation of public and private universities. The latter is realized according to the standards and criteria adopted by the public authorities.

Currently, ANQA is a full member in the European Association for Quality Assurance in Higher Education (ENQA) and is a full member of International Network for Quality Assurance Agencies in Higher Education (INQAAHE). According to the Armenian legislation, the institutions can also apply to foreign accreditation organizations registered in the European Quality Assurance Register for Higher Education (EQAR) to undergo institutional or programme accreditation, in addition to applying to ANQA, as well as to the full members of the European Association for Quality Assurance in Higher Education (ENQA). For the purpose of bringing Armenia's higher education QA system into compliance with EHEA ESG requirements, the Government approved new procedures and criteria for state accreditation of the professional education institutions in 2011. New accreditation procedures stipulate all vocational and higher professional educational institutions to undergo mandatory institutional accreditation, while programme accreditation is done on a voluntary basis. The institutional accreditation is undertaken cyclically, and is a mandatory requirement for the further programme accreditation.

Both institutional and programme accreditation processes are implemented in the following three successive phases: 1. internal self-evaluation and preparation of self-analysis report; 2. external evaluation by groups of experts, site visits of the experts to the institutions, and production of respective report; 3. decision making: making a decision on accreditation with three possible outcomes depending on the extent of the institutions' conformance with established standards: awarding accreditation, awarding conditional accreditation and rejecting accreditation. Based on the decision of the Accreditation Commission the Minister of Education and Sciences awards the accreditation certificate, with the prior review of the compliance of the whole process to the legislation. Institutional accreditation is granted for a period of 4 or 6 years and conditional accreditation is valid for 2 years. Programme accreditation is granted for 5 years and conditional for 2. From 2011 to 2018 institutional accreditation was granted to 25 universities and 6 education programmes in 3 universities.

STRENGTHS	WEAKNESSES
• Introduction of 'Ecology' subject as a mandatory subject in the higher schools of Armenia which will promote the awareness- raising, the comprehension of the significance of the environmental education	• Despite that “Education – 2015” programme links the need to improve education in Armenia with the need to ensure the sustainable economic development and competitiveness in the context of the national security and

	the sustainable development strategy, it does not address environmental education at all. However, the timeframe of this programme is 2011- 2015 and soon the ministry will focus on developing the next education state programme, which is an opportunity for Armenia to address the need to improve environmental education in the country. • The current Governmental program lays down a very vague notion about the need to boost or promote environmental education in all the circles of education through informative TV programs and non-formal education. • The main law governing education and science is still in the stage of development so it is still unclear what this draft law envisages for the development of promotion of environmental education in Armenia. • There are no specific governmental funding schemes available to modernize environmental education in Armenia

OPPORTUNITIES	THREATS
• Accession of Armenia to international environmental conventions, which, inter alia, requires enhancement and dissemination of environmental education • International projects focusing on environmental education and environmental literacy[16]. • Enhancing and strengthening the collaboration between the governmental bodies for the implementation of joint policy to boost environmental education (Ministry of Education and Science, Ministry of Environment, and Ministry of Natural Resources)	• The government does not fulfill its international obligations; including those from the Aarhus and the 3 Rio Conventions related to Environmental education. • The requirement for programme accreditation is till voluntary which means the HEIs in Armenia don't have enough motivation to apply for programme accreditation plus there is a need for extra funds as the programme accreditation is rather costly and most universities just can't afford it, especially in terms of the academic programs with a low number of students such as the natural sciences, particularly the environmental sciences.

16 http://www.am.undp.org/content/armenia/en/home/operations/projects/environment_and_energy/generate-global- environmental-benefits-through-environmental-edu.html

4. Demand for Specialists in Ep with Postgraduate Degrees

If possible – potential employment opportunities, employability statistics in the past, trends in the future, motivation/demotivation factors for the choice of the EP programme. If possible – with references. Please write ½ page on it and extract threats/opportunities.

According to National Competitiveness Report of Armenia 2019[17], the global job market is undergoing structural transformations. Economic, socio-demographic, technological, and environmental drivers are changing the demand and requirements of the labor market. Transformations in the job market create unique opportunities for development, particularly for developing economies, as well as challenges such as job destruction, potential workforce shortage, unemployment risks, skillset mismatch, and so forth. Addressing these challenges is critical for building a strong and employable workforce, maintaining high levels of employment, and enabling sustainable economic growth.

To gauge the pulse of job markets, obtain insight on emerging needs, and compare local with global trends, EV consulting conducted an enterprise survey in Armenia congruent with the sampling and methodology used by the World Economic Forum (WEF) in their recent study on the future of jobs. The survey focuses on three main themes: strategic development plans of the companies, technological transformations, and skillset requirements of the workforce. It aims to shed light on the understanding and intentions of companies that shape workforce demands across different industry sectors. Special attention is paid to technological breakthroughs in understanding their potential for creating and disrupting jobs.

Trends identified in Armenia as a result of the future of jobs survey in Armenia are in line with global trends. New jobs and professions are emerging, transforming the current ones or totally replacing them as a result of the technological revolution, socioeconomic conditions, demographic and environmental changes, and geopolitical factors. Some occupations and roles are projected to become redundant and will disappear during the upcoming five to 10 years.

Tasks conducted by workers will be transformed in the future as a result of automation and technological advancement. The fraction of tasks performed by humans instead of machines is declining rapidly. Even the tasks that are considered to be inherently human—communication and interaction, coordination, management and advising, as well as reasoning and decision-making—are expected to be partially automated in near future.

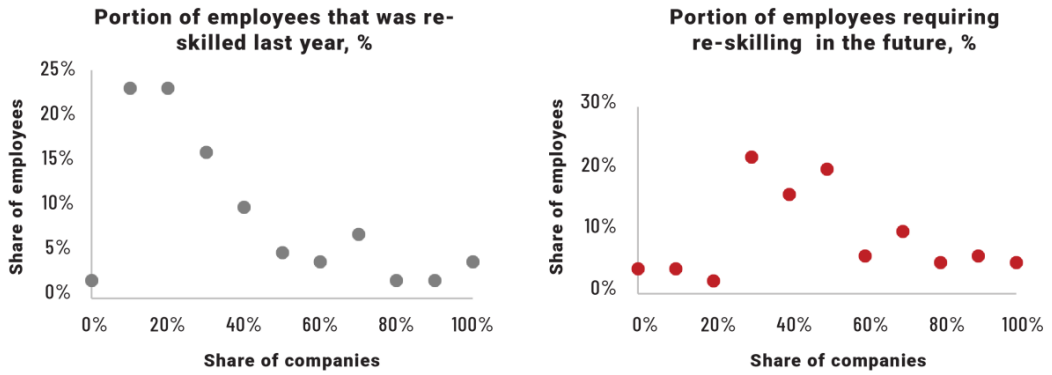
Skill requirements for employment are changing along with job market transformations and the technological revolution. Reskilling and upskilling of employees becomes a necessity

[17] http://evconsulting.com/what-kind-of-skills-will-be-required-for-the-future-of-jobs-in-armenia/

globally. The share of companies that plan to put effort into reskilling their employees is expected to rise compared with the current practice. Only 20% of surveyed companies in Armenia have reskilled their employees during the past 12 months prior to the survey. Currently 30-50% of organizations surveyed think that at least 15-25% of their workers will require reskilling in the future.

Graph 1: Portions of Employees Being Reskilled in Armenia during 2018 vs portions of employees requiring re-skilling in the future, by %

Insights from the future of jobs survey in Armenia



Source: EV Consulting, The Future of Jobs Survey in ArmeniaSource: Operators' official web sites

The Global Future of Jobs survey conducted by the World Economic Forum revealed that at least 54% of all current employees around the globe will require reskilling or upskilling to meet employment requirements. Analytical thinking, innovation, and active learning and learning strategies are among the highly demanded skills. Technological skills are sharply increasing, which is an indicator of rapid technological adoption by companies. Soft skills such as critical thinking, creativity, negotiation and communication, innovation, emotional intelligence, and leadership increase their value significantly as "human" skills.

About 66% of the survey respondents in Armenia stated that coordinating, managing, decision-making and advising, as well as information and data processing are among the core tasks to be accomplished by key roles in their companies. More than 70% of respondents consider analytical thinking and innovation, teamwork, active learning, strategic thinking and complex problem solving to be the key skills required in order to accomplish core tasks.

Table 1: Top-Ten Skills in Demand in Armenia, Current Year (2019) vs. 2024

Today, 2018/2019	Trending, 2024	Declining, 2024
1. Analytical thinking and innovation	1. Analytical thinking and innovation	1. Manual dexterity, endurance and precision
2. Complex problem-solving	2. Active learning and learning strategies	2. Memory, verbal, auditory and spatial abilities
3. Critical thinking and analysis	3. Creativity, originality, and initiative	3. Management of financial and material resources
4. Active learning and learning strategies	4. Technology design and programming	4. Technology installation and maintenance
5. Creativity, originality and initiative	5. Critical thinking and analysis	5. Reading, writing, mathematics and active listening
6. Attention to detail, trustworthiness	6. Complex problem-solving	6. Management of personnel
7. Emotional intelligence	7. Leadership and social influence	7. Quality control and safety awareness
8. Reasoning, problem-solving and ideation	8. Emotional intelligence	8. Coordination and time management
9. Leadership and social influence	9. Reasoning, problem-solving, and ideation	9. Visual, auditory and speech abilities
10. Coordination and time management	10. Systems analysis and evaluation	10. Technology use, monitoring and control

Source: EV Consulting, The Future of Jobs Survey in Armenia

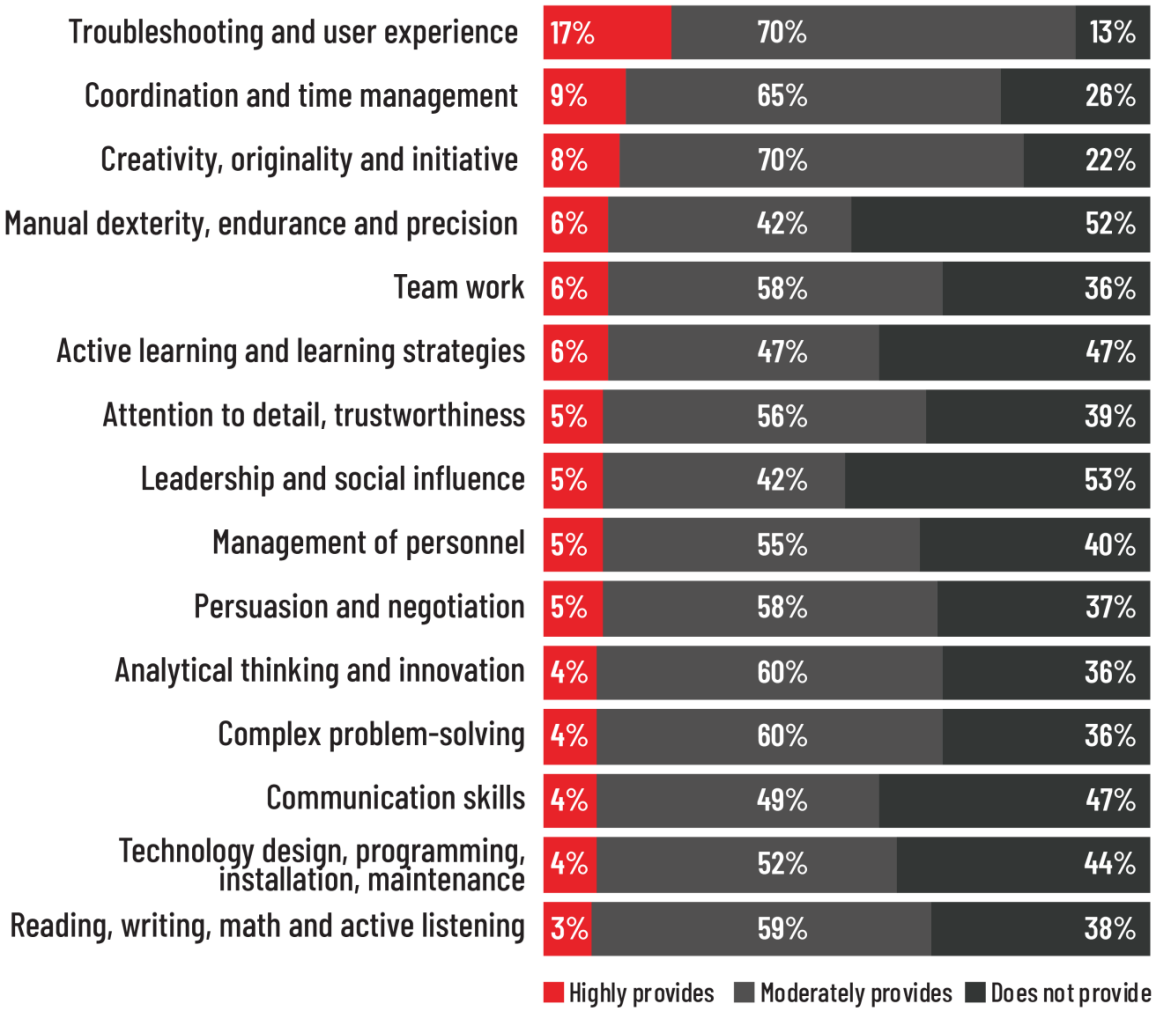
Survey results indicate that there is an increasing demand for soft skills such as innovative and creative thinking, active learning, originality, leadership and social influence, critical thinking, and problem-solving skills in Armenia. Coordination and time management as well as manual dexterity, endurance and precision, reading, writing, and active listening skills are the top skills projected to decrease by 2024.

More than 80% of surveyed companies favor the idea that higher education is crucial for the job market, although the learned skills may no longer be practical. The respondents evaluate the quality of education in Armenia as being average or low for both Bachelor's and Master's degree students.

The respondents cite students' lack of practical skills and ill preparedness for the labor market upon graduation. Fundamental skills required for entering the labor market are provided moderately or not at all. Soft skills such as communication skills, creativity and innovativeness, teamwork, leadership, and social influence are assessed as the top skills that universities fail to provide to students.

Graph 2: Types of Skills that Armenian Universities Provide, %

To



Source: EV Consulting, The Future of Jobs Survey in Armenia

address future job transformations, Armenia needs to have a comprehensive strategy for human capital development. Education system of the country needs to be enough flexible to adopt to the transformations and prepare students for the future of jobs. The country's quality of education needs to be improved and be able to adjust to the changing skillset demands for jobs and labor market requirements.

One of the major employers for ISEC NAS RA is the research organizations themselves where the professional departments of ISEC NAS RA are located. One of the ISEC's missions is to provide young specialists to the Academy of National Academy of Sciences of Armenia and ensure the integration of education and science.[18] For example, "Environmental Protection and Nature Management" Master's degree students are engaged in the research activities of the Center for Ecological-Noosphere Studies of NAS RA from their first year of studies. Students write and defend term papers that become immediate parts of their Master theses. Master thesis framework includes experimental research activities, scientific literature

review, assignments on thesis topics. Starting from 2010 up to now, 9 master graduates have been working at the research departments of the Center for Ecological- Noosphere Studies of NAS RA and 4 Master students have continued their education as PhD students. Besides that, the EP graduates of ISEC NAS RA have been employed at schools, ministries, mining companies etc.

Analysis of ISEC Graduate Employment for 2012-2016

	Number of Employed Graduates
RA Ministries, enterprises and other organizations	253
Research Organizations and Institutions of NAS RA	65

ISEC NAS RA seeks to continuously review and improve its teaching and learning quality. The aim of this questionnaire is to give an opportunity to the faculty staff of ISEC NAS RA to take into consideration the graduates' opinions when reviewing the curriculum. Here are the findings of the graduate satisfaction survey for "Environmental Protection and Nature Management" Master's degree program for 2016-2018:

[18] https://www.isec.am/images/razmavarakan_cragir/Razm_cragir_2019-2023.pdf

1. Study program and teaching methods enable obtaining sufficient theoretical knowledge needed for professional activities				
Completely agree	Agree	Don't agree	Difficult to answer	
100,0%	0,0%	0,0%	0,0%	
2. Study program and teaching methods enable obtaining practical skills				
Completely agree	Agree	Don't agree	Difficult to	
66,7%	33,3%	0,0%	0,0%	
3. Study program and teaching methods enable forming practical problem-solving skills				
Completely agree	Agree	Don't agree	Difficult to answer	
33,3%	66,7%	0,0%	0,0%	
4. Graduates possess necessary knowledge of computer software and applied programs				
Completely agree	Agree	Don't agree	Difficult to answer	
33,3%	33,3%	0,0%	33,3%	
5.Graduates have sufficient knowledge of foreign languages to use them in their professional activities				
Completely agree	Agree	Don't agree	Difficult to answer	
0,0%	0,0%	33,3%	66,7%	
6. Subjects in general education block were recruited with academic staff having sufficient				
Completely agree	Agree	Don't agree	Difficult to answer	
0,0%	100,0%	0,0%	0,0%	
7. **Study program and teaching methods enable forming organizational skills**				
Completely agree	Agree	Don't agree	Difficult to answer	
33,3%	66,7%	0,0%	0,0%	

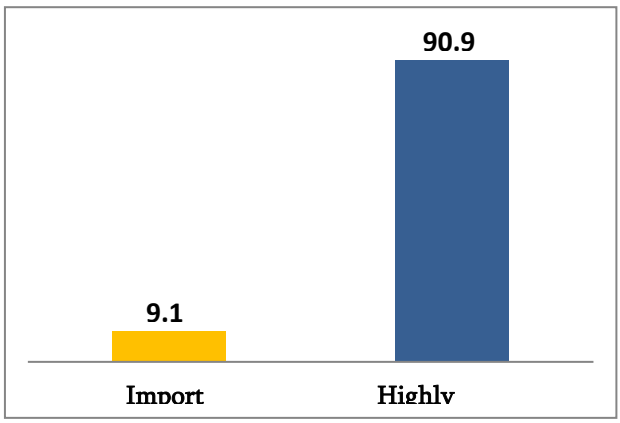
Analysis of the Research Results on the Evaluation of the Educational Programme Competence

'Environmental Protection and Nature Management' by Employers

The Quality Assurance Department of the International Scientific Educational Center of NAS RA (hereinafter ISEC) has conducted a survey on the satisfaction of the programme competence "Environmental Protection and Nature Management" educational program for employers. The goal of this survey is to provide the ISEC faculty with the opportunity to consider employers' opinions while reviewing an educational program.
The survey included some questions which were evaluated on a scale of 1-5. The questions aimed at discovering the importance of the details of the current analysis for the employers. Apart from the evaluation questions, there were also other optional questions.
The questionnaire involved some open-ended questions where the employers were expected to answer in the open text format based on their knowledge, feeling, and understanding. Such kinds of questions referred to the basic skills and knowledge, which according to the employer, an employee was supposed to have.
A total of 11 employers took part in the survey. The data were collected and analyzed for each problem separately on the principle of mutual disclosure. The data were also presented in a generalized form to maintain the principle of impartiality of the survey participants.
As a result of the data analysis it was found out that employers have emphasized the analytical capacity of their employees, their willingness to constantly learn and gain new knowledge, the capacity to plan and conduct research on environmental protection, since the average value for the mentioned features was the highest 4.91 out of the possible 5 scores. And the ability to work with lab equipment which was highlighted as the least important as the average value for this feature was the lowest 3.36, out of the 5 possible.

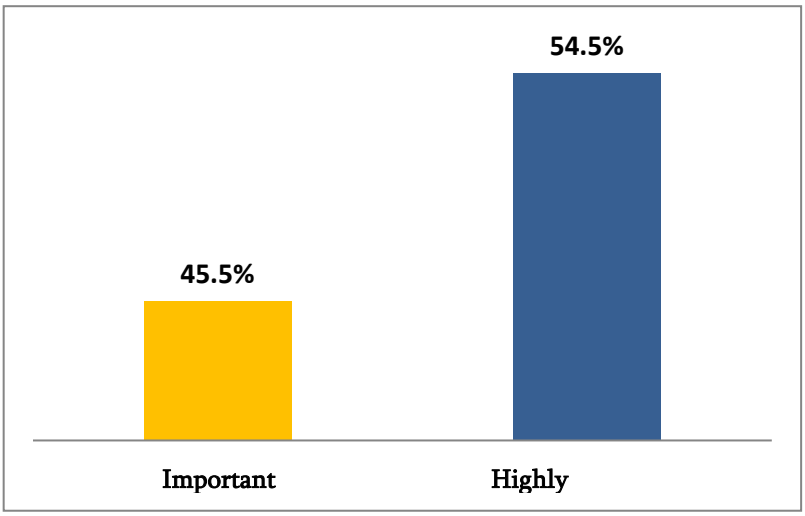
The survey responses are laid down in details below.
90.9% of the interviewed employers considered their employees' **analytical abilities** as highly important, and the remaining 9.1% as important.

Figure 1. Analytical Capacity (%)



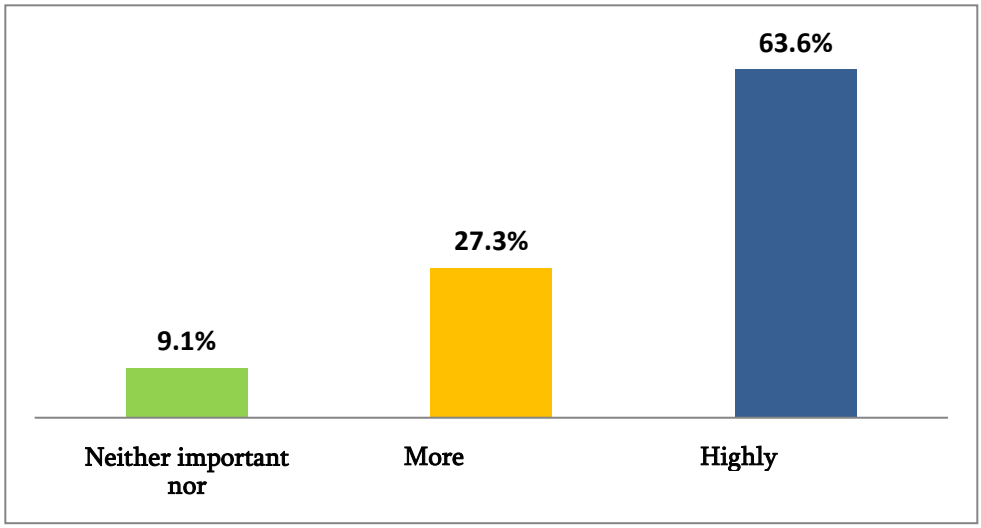
As regards to **the organizational skills,** the lowest percentage of the respondents compared to the previous question mentioned as highly important 54.5% and 45.5% as important.

Figure 2. Organizational skills (%)



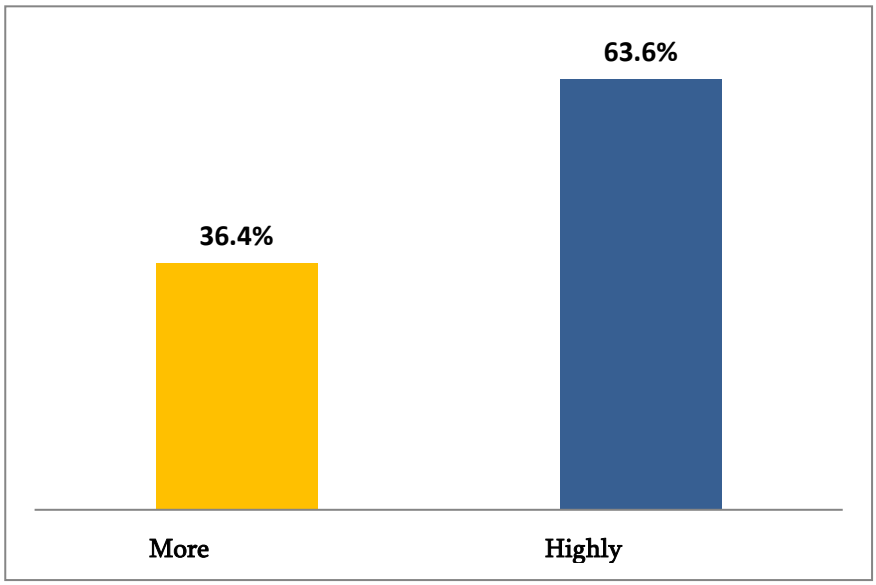
Foreign language skills were also important for employers, with 63.6% of the interviewed employers considered it highly important, 27.3% as more important, and 9.1% regarded it as neither important nor secondary.

Figure 3. Foreign Language Skills (%)



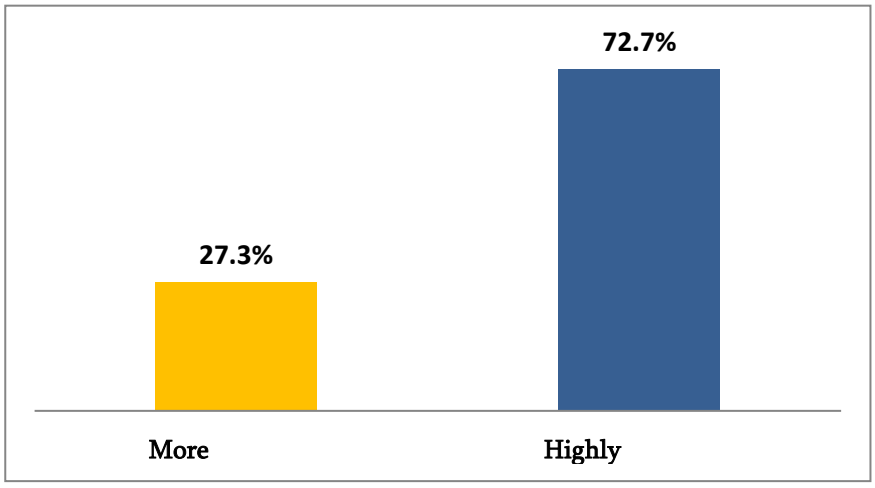
The creative approach towards professional activity was viewed as decisive to 63.6% of the respondents with the remaining 36.4% as more important.

Figure 4. Creative approach to work (%)



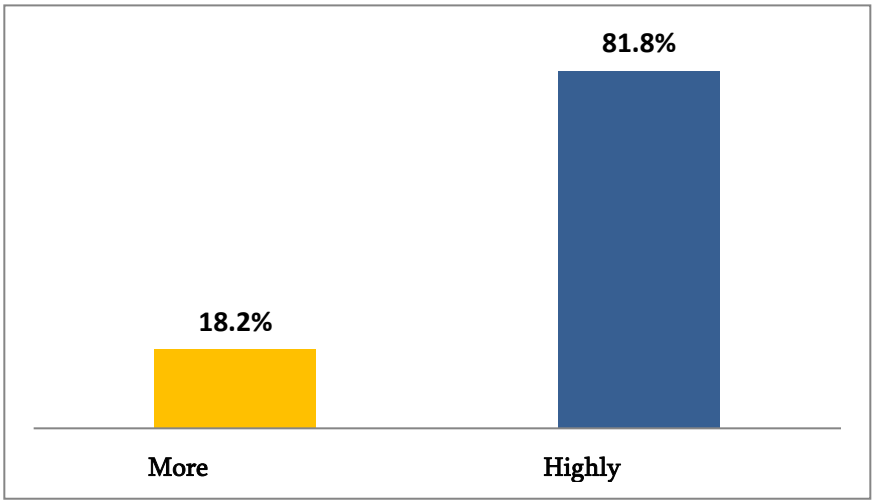
Knowledge of computer technology and software applications is of the highest importance among 72.7% of respondents, and more important to 27.3%.

Figure 5. Computer skills (%)



It is worth pointing out the fact that when it comes to spatial data, the interviewed employers have found the knowledge of **ArGIS** as the most important, while the knowledge of **QGIS** and **GRASS** programs was mentioned as less important.
On the other hand, employers have emphasized the importance of the **Statistica** program for making statistical analysis, while the programmes like **SPSS Statistics** and **R Statistics** were of less importance.
Partnerships and teamwork were highly important for 81.8% of respondents, while the remaining 18.2% was more important.

Figure 6. Partnerships and teamwork skills (%)



The next question referring to professional knowledge focused by the employers was the importance of the subject-study areas and the importance of the latter for their organization.

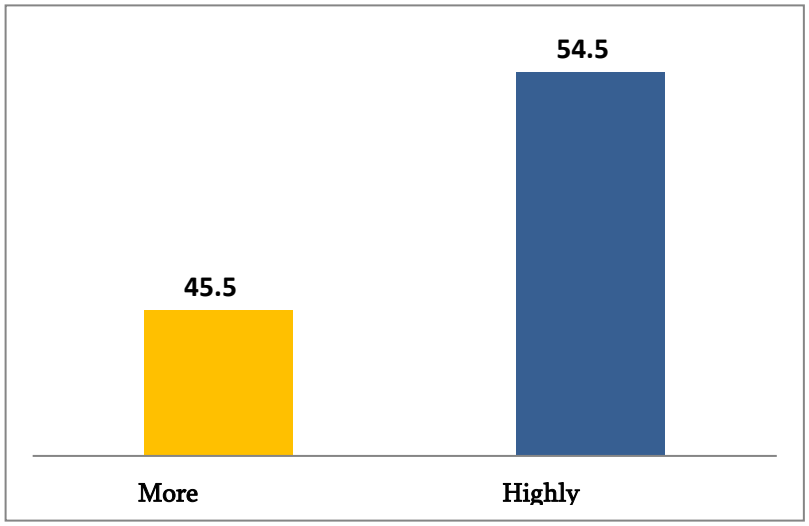
The next question referred to professional knowledge: which subject courses were of most importance for the employees and their companies. Most employers responded in the following manner:

Table1. Frequency of selection of subject courses

Subject Courses	Frequency
1. Environmental Geochemistry	6
2. Environmental Statistics	6
3. Soil Quality Management	7
4. Urban Ecology	6
5. GIS	9
6. Spatial Data Infrastructure and Data Management	5
7. Landscape Planning	4
8. Complex Geomapping	3
9. Applied Remote Sensing	1
10. Environmental Toxicology	2
11. Food Safety Risk Assessment	3
12. Environmental Radiation Protection	3
13. Environmental Monitoring and Measurement Devices	6

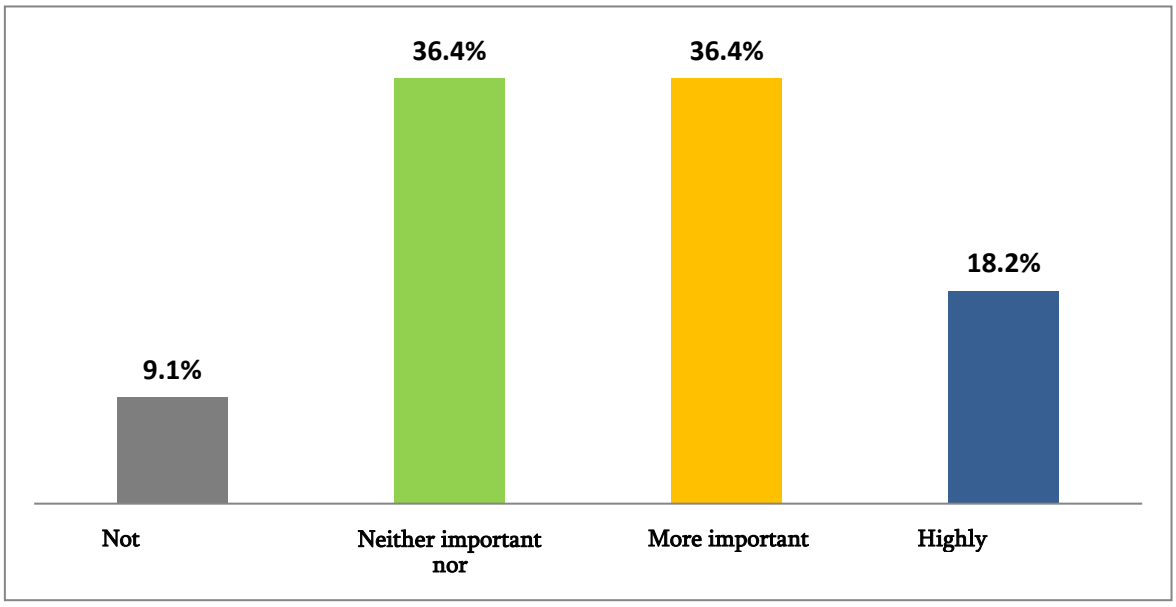
Moreover, for 54.5% of the surveyed employers find **the compliance of the theoretical knowledge to the requirements posed by the company as** highly important, while for 45.5% it is more important.

Figure 7. Compliance of the theoretical knowledge to the requirements posed by the company (%)



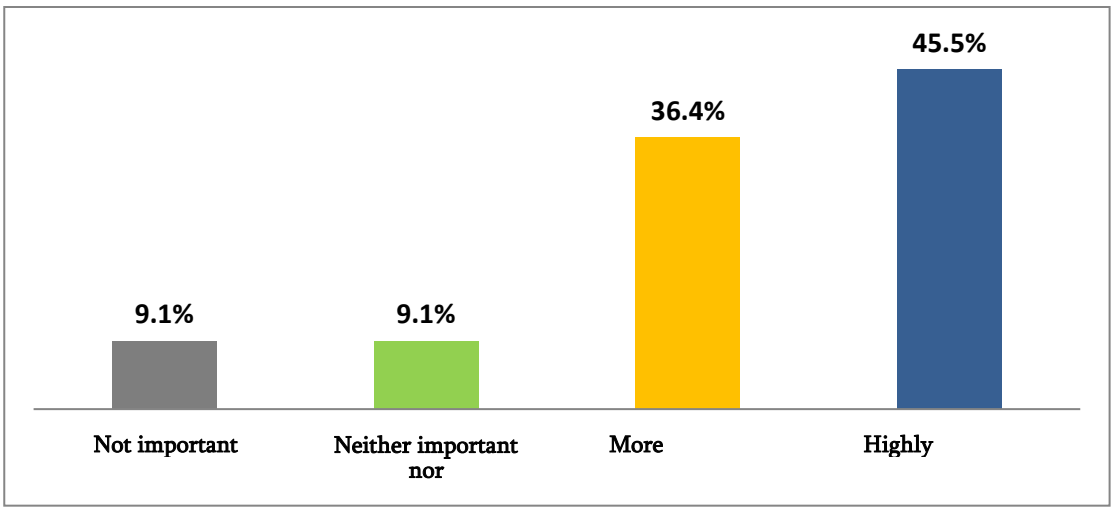
Unlike previous points, **the availability of national and international certificates is of less importance for** employees. The findings show that only 18.2% consider them to be as highly important: for 36.4% it is neither important nor secondary, for 36.4% it is more important, while for 9.1% it's not important at all.

Figure 8. Compliance of the theoretical knowledge to the requirements posed by the company (%)



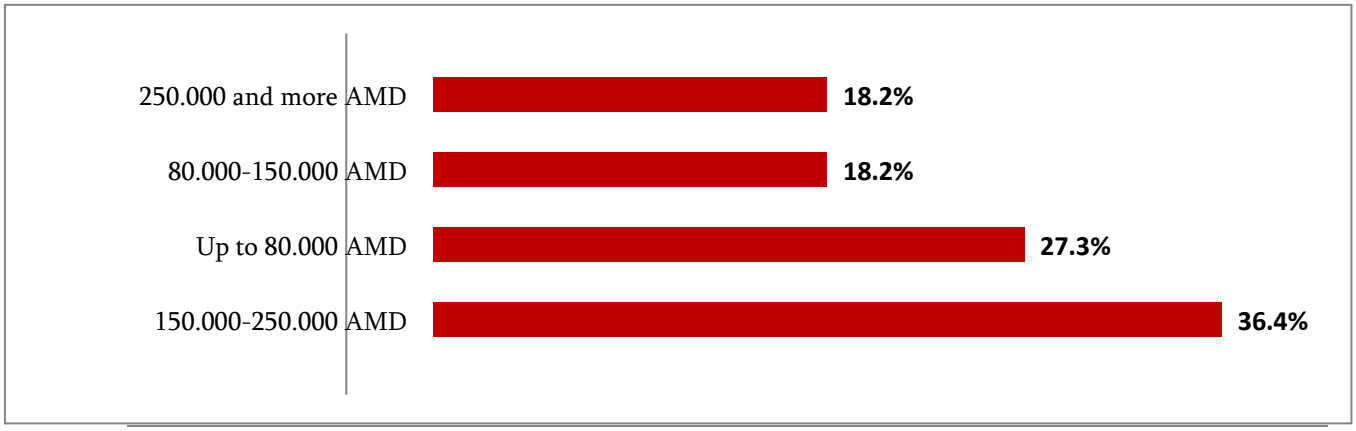
Like the previous point, the fact of having **a master's education** is relatively less important, particularly for 45.5% of the surveyed employers it is highly important, for 36.4% it is more important, 9.1% think it's neither important nor secondary and another 9.1% think it is not important at all.

Figure 9. Fact of having a master's education (%)



In regard how much salary they are willing to pay to a qualified graduate with a Master's degree, 36.4% of the surveyed employees mentioned 150000-250000 AMD. The detailed answers are available below:

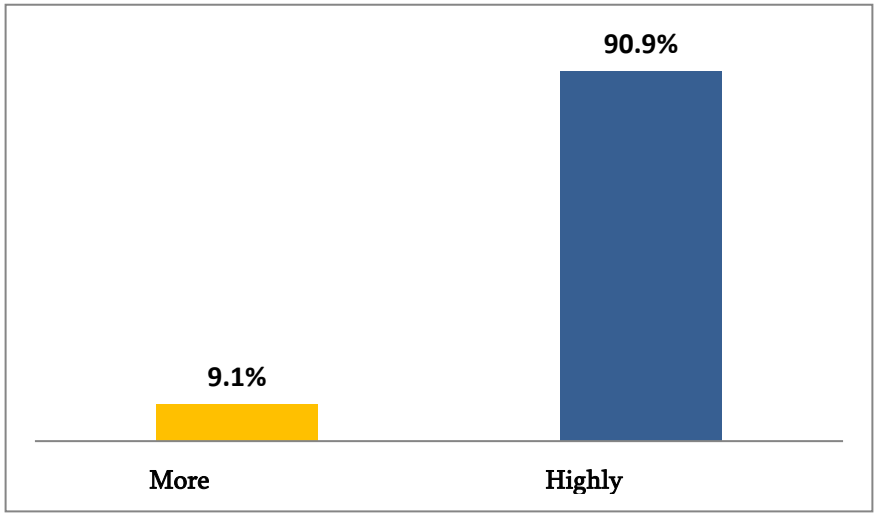
Figure 19. How much salary are you willing to pay to a qualified graduate with a Master's degree, who completely complies with the requirements of your company (%)?



It's noteworthy that for employers **the willingness for continuous learning and acquisition of new knowledge** is highly important for the majority of the respondents 90.9%.

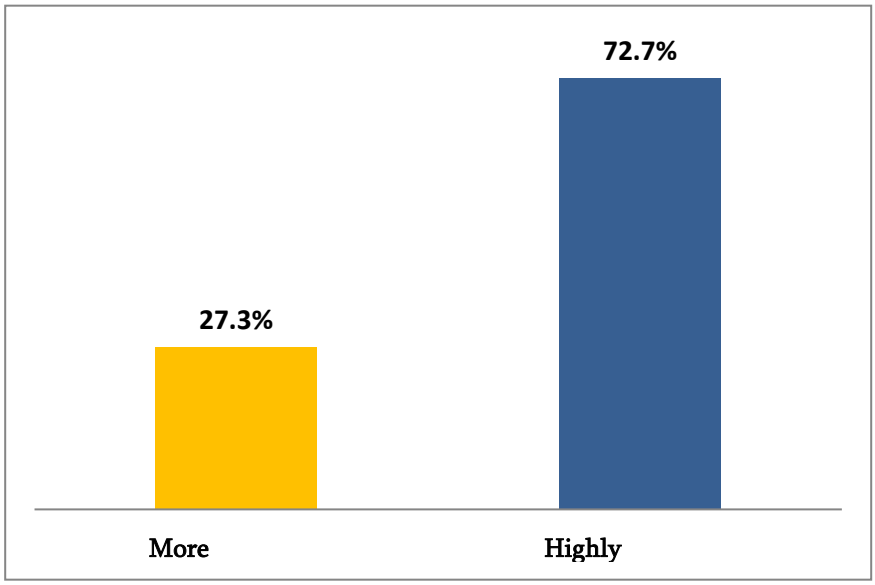
It can be concluded that for employers it is more important to have employees willing to acquire new knowledge than to have national and international certificates proving their knowledge:

Figure 10. Willingness for continuous learning and acquisition of new knowledge (%)



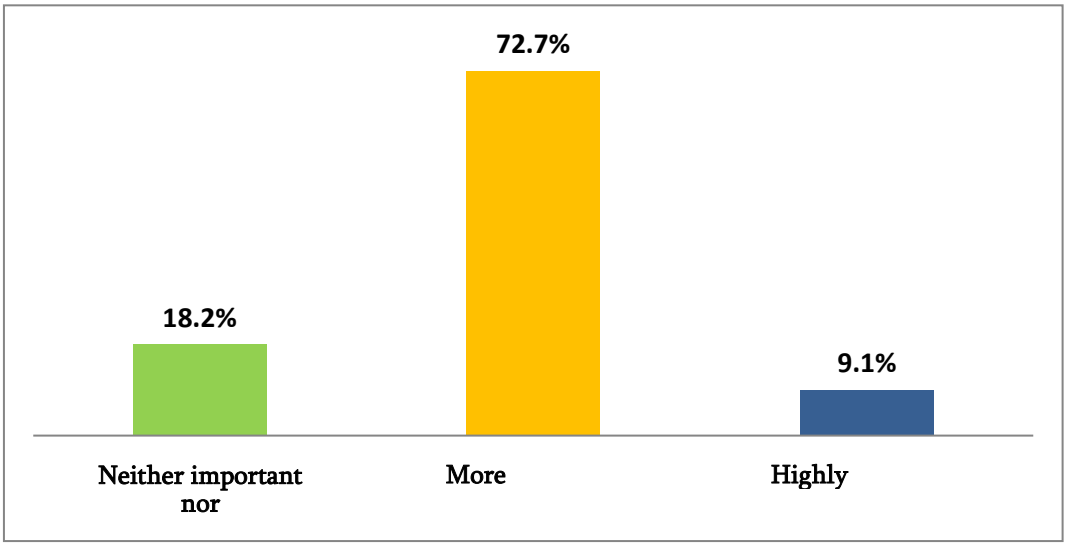
Availability of narrow professional knowledge is also important for the employees, as 72.7% of the surveyed employers think it is highly important, while 27.3% think it is more important:

Figure 11. Availability of narrow professional knowledge (%)



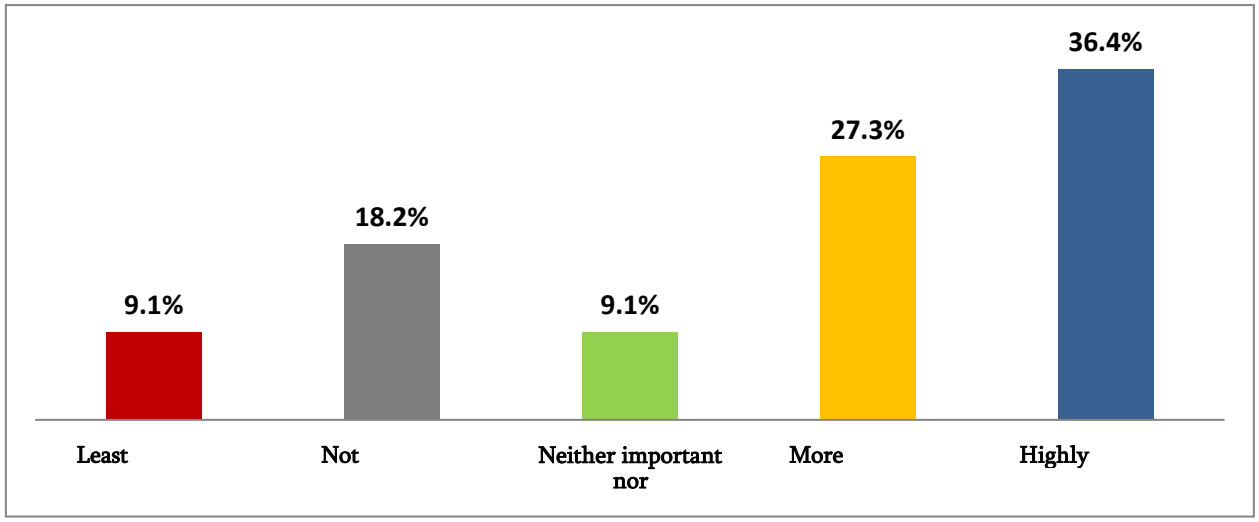
The track record in the specific field is highly important only for 9.1% of the surveyed employers, for 72.7% it is more important, while remaining 18.2% consider it neither important nor secondary.

Figure 12. Track record in specific field before employment (%)



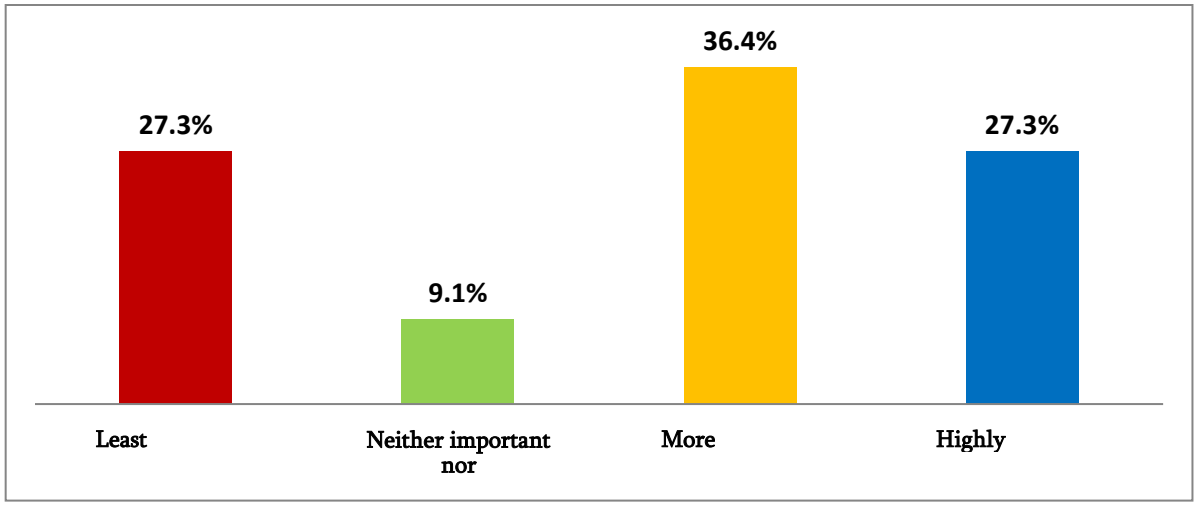
The ability to work in complex field trips is relatively less important for the employees:

Figure 13. Ability to work in complex field trips (%)



Abilities to work with lab equipment are also of little importance for the employees, as only 27.3% of the surveyed marked it as highly important:

Figure 14. Abilities to work with lab equipment (%)



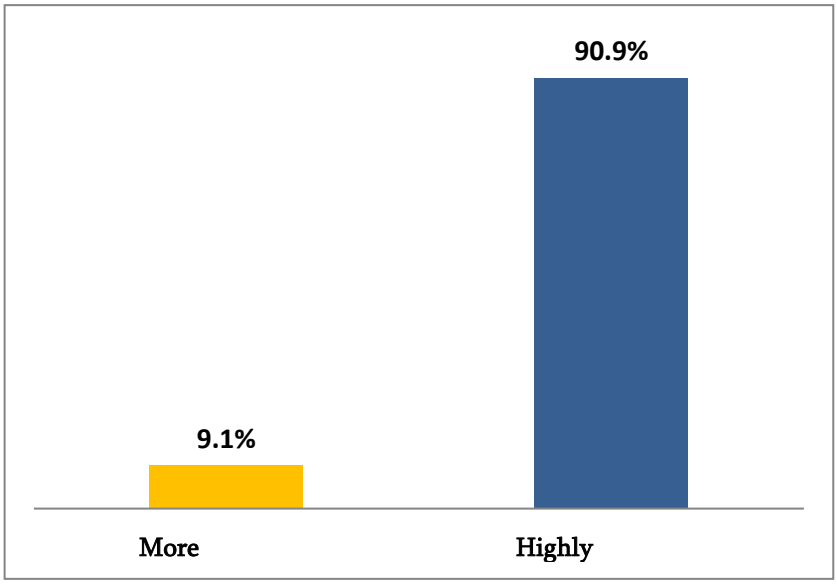
At the same, it is important to note that the surveyed employees valued the skills to work with the following lab equipment:

- pH-meter Hanna Checker
- GPSMAP64s Germine
- HI 99121 Soil pH checker
- Scanning Electron Microscope
- Analytical scales

- Innov X-5000 – portable XRF analyzer
- Horriba U-53G – multiparameter water quality checker
- AquaCalc 5000 Pro – stream flow computer
- Aspirator ABA-1-120-02A – air dust sampler
- Gamma-spectrometry system supplied with a HPGe semiconductor detector and GENIE- 2000 and LABSOCS software (Canberra)
- Radonometer RAD 7 (Durridge)
- InSpector™1000 portable multi-channel analyzer (Canberra)
- E-600 portable radiation monitor (Eberline)
- HPLC
- Microwave digester
- Fixed wing UAV eBee SQ
- "AAnalyst 800" Atomic Adsorption Spectrometer
- "AAS1N" Atomic Adsorption Spectrophotometer
- "ПФМ-БП" Flame Emission Photometer
- "СФ-46" Spectrophotometer
- "DR/2400" Portable Spectrophotometer
- "Trace DSQ" Gas Chromatograph/ Mass-Spectrometer

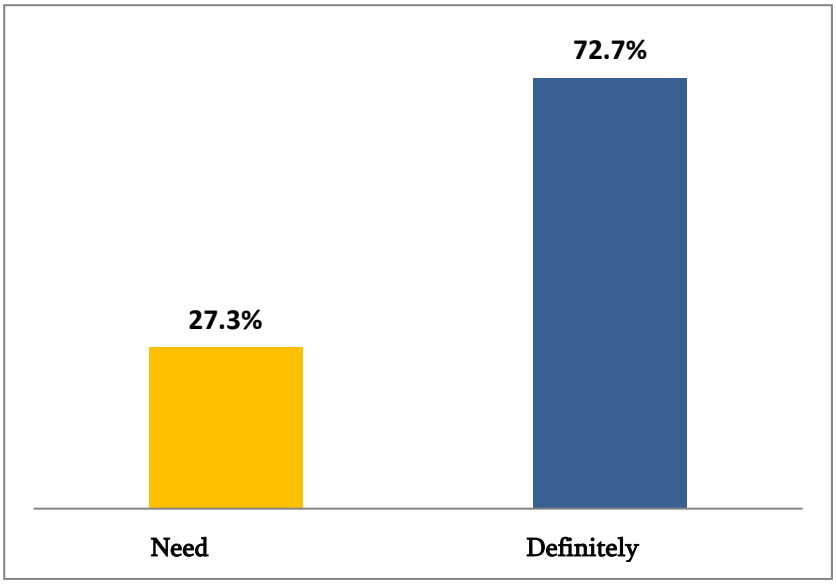
Unlike other points, **research planning and implementation in the EP** are considered to be highly important with 90.9% of the employees and only 9.1% consider it to be more important:

Figure 15. R**esearch planning and implementation in the EP (%)**



It's noteworthy that in all cases the surveyed employers noted that their employees **need short-term trainings**, where 72.7% selected definitely have, while 27.3% selected need options.

Figure 16. Whether your employees need short-term trainings (%)

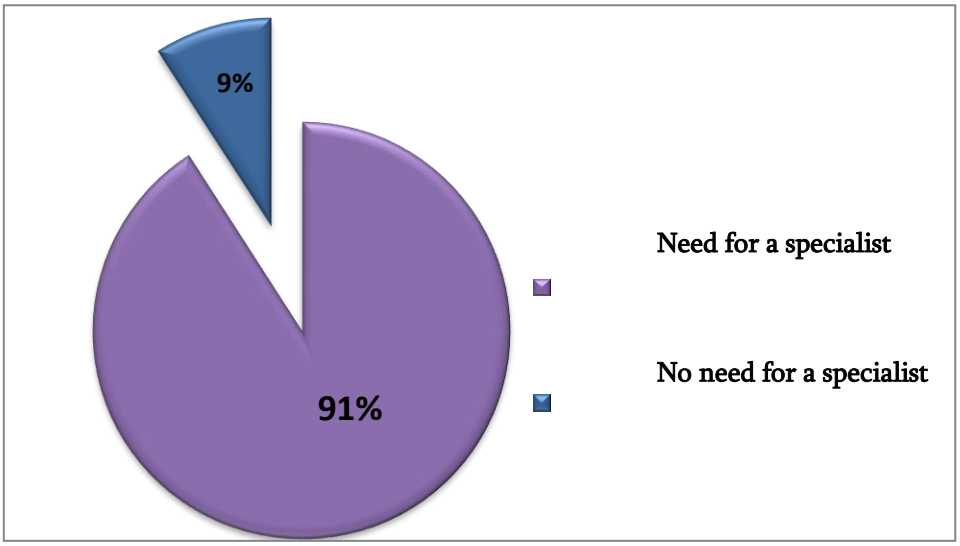


The fields of trainings completed by the employers are of particular interest:

- Journalism
- Food Safety (veterinary medicine, phytosanitary)
- Management
- Geobotany
- Food risk assessment
- Environmental education and public awareness-raising
- Urban ecology
- Environmental geochemistry
- Environmental statistics
- Assessment of ecosystems
- Evaluation of damage caused to environment
- Environmental insurance
- Policy making and development

Another important datum is that the majority of the surveyed employers 90.9% mentioned that their company needs specialists in the environmental protection studies and only 9.1% mentioned they don't need such a specialist.

Figure 17. Whether the company needs specialists in the environmental protection studies (%)

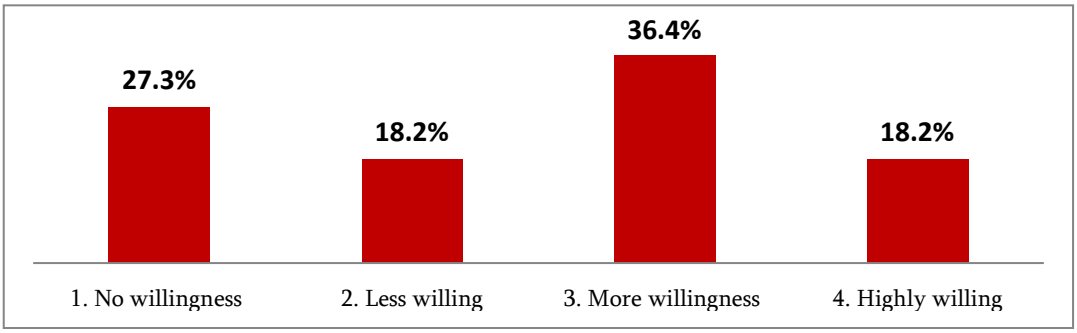


Here it is important to understand the departments and professions of the companies that need such specialists: the options mentioned by the respondents are as follows:

- Department of geobotany ecological physiology;
- Specialists in environmental impact assessment, hydrogeologists;
- Environmental Department of Yerevan Municipality;
- Ministry of Environment.

It's noteworthy that their companies are employing 3,4 or 5 employees specialized in the EP. When speaking about paying extra to the employees with professional education, in this case the employees are not that willing: only 18,2% of the surveyed employees noted they are highly willing, 36,4% noted they are more willing, 18,2% - less willing, while 27,3% showed no willingness at all options.

Figure18. To what extent are you willing to pay extra or set privileges for employees with professional education? (%)



Interesting data was extracted from the questions relating the knowledge, skills and abilities of the employees, where each employee had an option to submit three answers. The results are as follows:

Most important 3 pieces of knowledge (most frequent responses are highlighted in red):

- Field-specific professionalism – ability to write, to provide information in a precise and literate manner,
- Knowledge of field-specific legislation,
- Knowledge of languages – at least English and Russian
- Plant geography and geobotany
- Ecological physiology
- Toxicology
- Statistics
- Biology
- Professional knowledge
- Ecology
- Law

What about **3 most important abilities**, the employers mentioned the following options:

- Ability to digest and provide information quickly
- Ability and willingness to work in a team
- Creative approach
- Being willing and kind - this is what I can say based on my own experience
- Promptness
- Diligence
- Creativity
- Professional knowledge
- Language knowledge
- Ethics
- Field trips
- Ability to analyze the task
- Ability to identify problems on time,
- Ability to divide complex problems into logical components and to solve them step by step

What about **3 most important skills**, the employers mentioned the following options:

- Computer skills
- Skills in writing in different genres
- Filming and editing skills
- Application of cutting-edge IT,
- Relevant qualifications,
- Application of knowledge in the specific field,
- English
- Mapping skills
- Creative thinking
- Communication skills
- Skills on conducting examinations on the spot and drafting reports,
- Ability to give realistic solutions to the problems based on the facts,
- Ability to prioritize working processes,
- Decision-making after evaluation of all probable solutions.

5. Internal factors: Existing baseline

Available EP programmes/courses per partner University, short characteristics, experiences. Extract strengths/weaknesses

National Academy of Sciences of Armenia*:* The Center for Ecological-Noosphere Studies (Ecocenter NAS RA) of the Academy implements environmental educational and training programmes. The Ecocenter NAS RA unifies a number of laboratories and individual researchers involved in the field of ecological studies. The UNESCO Chair on "Education for Sustainable Development" is operating in the Ecocenter. The mission of the Chair is to promote the integration of educational, scientific and innovative processes into sustainable development sphere at national and regional levels in the framework of the UN "Education for Sustainable Development" decade (and since 2015***).***

International Scientific-Educational Center of NAS RA offers a Master's degree program in "Environmental Protection and Nature Management" aiming at the preparation of environmental specialists based at Center for Ecological-Noosphere Studies. The curriculum of Environmental Protection and Nature Management" is available in Appendix 1

https://www.isec.am/en/departments/environmental-protection-and-nature- management.html

http://cens.am/education/master-course-chair-environmental-protection-and-nature-management

http://cens.am/education/unesco-chair-education-for-sustainable-development

Out of all the universities offering education related to EP, the curricula of two universities have been studied as the most relevant to EP, the curricula of Yerevan State University and Armenian State Pedagogical University.

Yerevan State University: This University has a Chair of Ecology and Nature Protection and a program of Ecological Chemistry. The program of Ecological Chemistry is not relevant to this study, as it has only a Bachelor's program, no Master's degree program is available: http://www.ysu.am/faculties/en/Chemistry
In connection to Chair of Ecology and Nature Protection, detailed information about the chair is available here: http://www.ysu.am/faculties/en/Biology/section/structure/amb/49

The organization of the courses of "Ecology and Nature Protection" at YSU is implemented by the lecturers of department. In present the lecturers of the department teach the course "Principles of Ecology and Nature Protection" in 17 different faculties of YSU. The only relevant Master's degree program offered by YSU is "Ecology and Management of

Bioresources". The main professional courses offered within this Master Degree Program are available in Appendix 2.
Full details are available at:
http://www.ysu.am/education/Archive/Full- Time/2018/Biology_2018.pdf
YSU also has Center for Ecological Safety, where the main approaches of investigation are ecological safety assessment and prediction of environmental pollution with pesticides, heavy metals (Hg, Pb, Cd, Sr, Cu, Fe, etc.), surfactants, as well as the investigations of noise level in people permanent or temporary residences to proffer noise control and decrease methods.
http://www.ysu.am/faculties/en/Biology/section/structure/amb/49

Armenian State Pedagogical University (ASPU): within ASPU, the Faculty of Biology, Chemistry andGeography provides BA and MA courses in Environmental Chemistry/Natural Resource Use to future teachers in full–time and part-time modes. This university has also the Chair of Ecology and Sustainable Development. The course on "Fundamentals of Ecology and Environmental Protection" is taught to students enrolled in ecological education and culture for non-professional chairs.
https://aspu.am/en/page/faculty_of_biology_chemistry_and_geography/
The core subjects offered in "Environmental Chemistry (Environmental Protection and Nature Management)" Master's degree program at ASPU are available in Appendix 3 together with the core subjects offered in "Environmental Sciences" Master's degree program offered by ASPU.

Gavar State University: Gavar State University has a Chair for Biology, Ecology and Healthy Lifestyle which offers both Bachelor and Master's degree programs. The curriculum for the Master degree program is available in Appendix 4.

http://gsu.am/hy/%D5%AF%D5%A5%D5%B6%D5%BD%D5%A1%D5%A2%D5%A1%D5%B6%D5%B8%D6%82%D5%A9%D5%B5%D5%A1%D5%B6-%D5%A7%D5%AF%D5%B8%D5%AC%D5%B8%D5%A3%D5%AB%D5%A1%D5%B5%D5%AB-%D5%A5%D5%BE-%D5%A1%D5%BC%D5%B8%D5%B2%D5%BB-%D5%A1/

State Engineering University of Armenia: Educational major in Environmental Protection and Natural Resource Management (industry-specific).
https://polytech.am/en/institutions/faculty-of-chemical-technology-and-environmental-engineering/
https://polytech.am/en/institutions/faculty-of-mining-and-metallurgy/

Armenian University of Economics: Professional Chair on Principles of Nature Use and trainings.
https://asue.am/en/faculty/mth/chair-of-environmental-economics
Ljevan Branch of Yerevan State University*:* Professional course on Nature Protection
Gavar Branch of Yerevan State University*:* Training of teachers of Nature Protection
American University of Armenia (AUA): within this university, two centers are particularly related to environmental education.
Acopian Center for the Environment: Yerevan Municipality has invited the Acopian Center for the Environment of AUA to deliver innovative extracurricular environmental education courses to public middle and high school students.

Center for Responsible Mining: The Center for Responsible Mining of AUA promotes the creation as well as transfer and adoption in Armenia of best practices in socially, environmentally, and *economically responsible mining. The center works with companies, civil society, and the public sector to achieve this goal.*

Environmental Education Network (EEN)

The EEN is a unity of more than fifteen civil societies, governmental, educational and international organizations, whose main goal is to contribute to the efforts of Armenia in promoting and ensuring environmental education at all school levels and communities.

http://eenarmenia.org/

STRENGHTS	WEAKNESSES
• There is a number of universities offering a number of programs covering different aspects of environmental education	• As ISEC offers only Master's degree programs and PhD programs and doesn't have Bachelor programs, the integrity of the education is disturbed. It has to recruit Bachelor graduates from other universities, while universities offering Bachelor degrees in the EE have more students.

The National Center for Professional Education Quality Assurance Foundation (ANQA) in its report for 2018 has summarized the problems that the HEIs currently face, which they identified during institutional accreditations[19]:

- In case of curricula – no benchmarking carried out which has a negative influence on the comparability and compatibility of the curricula and which results in the problems during the mobility programs. The curricula offered by the HEIs are not flexible and don't support student mobility;
- HEIs don't have effective mechanisms to identify students' needs;
- The environment for students with special needs is a problem in many HEIs;
- Professional trainings for the academic staff in the HEIs are few: no needs assessment carried out in these terms;
- One of the weak points in the HEIs is internationalization due to poor knowledge of foreign languages, absence of joint or double degree programs in HEIs;
- Ineffective public accountability and responsibility mechanisms;
- The Plan–Do–Check–Act Procedure is not sufficiently used as a QA principle;
- Needs of academic staff trainings and professional trainings are not held (or are held partially without coordination).

19 http://www.anqa.am/hy/%D5%B0%D6%80%D5%A1%D5%BA%D5%A1%D6%80%D5%A1%D5%AF%D5%B8%D6%82%D5%B4%D5%B6%D5%A5%D6%80/%D5%B0%D5%B0-%D5%A2%D5%B8%D6%82%D5%B0%D5%A5%D6%80%D5%AB-%D5%B0%D5%A1%D5%B4%D5%A1%D5%AF%D5%A1%D6%80%D5%A3%D5%A1%D5%B5%D5%AB%D 5%B6-%D5%AD%D5%B6%D5%A4%D5%AB%D6%80%D5%B6%D5%A5%D6%80%D5%A8-%D5%B0%D5%A1%D5%BE%D5%A1%D5%BF%D5%A1%D6%80%D5%B4%D5%A1%D5%A3%D6%80%D5%B8%D6%82%D5%B4-%D5%A1%D5%B6%D6%81%D5%A1%D5%AE-%D5%B4%D5%B8%D6%82%D5%B0-%D5%A5%D6%80%D5%AB-%D6%83%D5%B8%D6%80%D5%B1%D5%A1%D5%A3%D5%AB%D5%BF%D5%A1%D5%AF%D5%A1%D 5%B6-%D5%A6%D5%A5%D5%AF%D5%B8%D6%82%D5%B5%D6%81%D5%B6%D5%A5%D6%80%D5%AB-%D5%B0%D5%A1%D5%B4%D5%A5%D5%B4%D5%A1%D5%BF%D5%A1%D5%AF%D5%A1%D5%B6-%D5%BE%D5%A5%D6%80%D5%AC%D5%B8%D6%82%D5%AE%D5%B8%D6%82%D5%A9%D5%B5%D5%B8%D6%82%D5%B6/

SWOT Analysis of the academic programs carried out at ISEC NAS for the internal audit (Institutional accreditation) – an extract of the SWOT analysis for the academic programs at ISEC NAS RA

STRENGHTS	WEAKNESSES
• Academic programs are in line with the mission of the Center. • Academic programs are developed according to the requirements of the state educational standards. • Experience and opportunity to apply modern teaching and learning methods. • At the end of the academic year, taking into account the graduates' satisfaction surveys of the academic programs, assessment results of the academic programs by the employers, suggestions from the relevant departments, as well as the report by the chairmen of the State Certification Committee, appropriate changes are made in the syllabi of the academic programs. • The approval of the new courses has a probation period. • Research activities in the relevant academic organizations are taken into account while choosing a Master thesis topic. • Constantly improving system of the students' knowledge assessment. • Academic programs are developed based on the courses provided by the relevant research organizations. • There are adequate modern laboratories, science and technology base and library stock for the implementation of academic programs.	• Lack of the experience of the annual monitoring of academic programs. • Lack of the mechanisms for assessing and revising the results of the full cycle of the academic programs, as a result insufficient justification from the perspective of the demands of the labour market. • Lack of sufficient experience were raised in definition of the learning outcomes and assessment. • Students and external stakeholders' lack of interest in the quality assessment and reviewal procedures of the academic program and its components were raised • Lack of experience exchange among master students, PhD students, lecturers and administrative staff from the leading educational institutions • Lack of trainings and evaluation concepts for lecturers and service staff for applying student-centered policy principle.

OPPORTUNITIES	THREATS
• Center – partner organizations, partnership and expansion opportunities. • ISEC internationalization through the expansion of inter-university network. • Continuous improvement of the conditions aimed at the Bologna Process development. • Opportunities for the international and national accreditation of the academic programs. • Joint development of academic programs (distance learning). • Increasingdemand for a number of specializations at the labour market.	• Limited opportunities to invite leading experts from foreign organizations. • Unstable and non-regulated labour market and unpredicted developments. • External stekeholders' (mainly employers) insufficient interest and participation in the implementation and continuous improvement of the academic programs. • Monopoly in the majority of academic programs. • Changing requirements of the labour market demand • Due to the changes in the existing labor market demand, external stakeholders' weak reaction and indifference.

ANQA's Main Recommendations to Academic Programs at ISEC NAS RA

- To develop policy and procedures on carrying out benchmarking of academic programs and other processes in order to fully apply the international leading practice for making the academic programs of the Center comparable with similar programs provided by foreign universities.
- To clarify the learning outcomes of the academic programs based on the results of benchmarking and the needs assessment of internal and external stakeholders, to ensure the linkage of the learning outcomes and the content of the subjects taught with the mentioned results.
- To improve current interdisciplinary MA programs and to promote the development of new programs. To introduce programs interlinked with industry and other research or educational institutions.
- To develop policy and procedures on the selection, evaluation of the effectiveness and modernization of student-centered teaching, learning and assessment methods in line with learning outcomes

- To clarify the mechanisms of needs assessment and analysis of internal and external stakeholders and labor market in the process of contextual and structural modernization of the academic programs.
- To clarify the criteria for the assessment of thesis papers and learning outcomes mentioned in the assessment system and in course descriptions involving all modes of assessment of teaching and learning results (practical and laboratory activities, internship, participation in seminars, individual and group works, etc.).
- To carry out all the processes mentioned in the regulation of academic program monitoring and regular review with the participation of internal and external stakeholders, to develop indicators for the evaluation of the effectiveness of academic program implementation and QA.

6. Availability of Resources at ISEC NAS RA

Availability of resources in Universities for the reforms. Human resources (teaching and technical personnel, students per teacher, please provide age/gender/qualification/etc. statistics), material resources (rooms, laboratories, equipment, etc.). Extract strengths/weaknesses.

ISEC NAS RA

Based on the permits issued by the Ministry of Education and Science, ISEC NAS RA has a right to offer professional education in the form of Master's degree programs in 28 specializations out of which 12 are in the natural sciences and 16 are in humanities and social sciences.

Master's degree programs offered per years

	2012	2013	2014	2015	2016
Full-time	17	16	12	7	8
Part-time	9	9	9	9	9

Total number of students in full-time and part-time Master's degree programs

First Year

	2012	2013	2014	2015	2016
Master's degree programs	606	574	560	358	404
Full-time	344	303	250	129	183
Part-time	262	271	310	229	221

Second year

	2012	2013	2014	2015	2016
Master's degree programs	517	542	491	489	3274
Full-time	355	306	257	225	113
Part-time	162	236	234	264	211

Every year the government allots from 30 to 37 governmentally funded places to ISEC NAS RA.

Number of female students in total figures

	2012	2013	2014	2015	2016
N. of admitted students	609	574	560	358	404
N. of admitted female students	390	356	341	191	218
Balance of female students	64%	62%	60,8%	53,4%	54%

Academic Staff

	2012		2013		2014		2015		2016	
Dr, Professor	48	24%	46	23%	46	23%	45	24.3%	24	17.8%
PhD, Associate Professor	117	58.5%	114	57%	114	57%	112	60.5%	92	68.1%
Lecturers without scientific degree	35	17.5%	30	15%	30	15%	28	15.1%	19	14.1%
Total	200		190		190		185		135	
Including with a scientific degree	165	82.5%	160	84.2%	160	84.2%	157	84.9%	116	85.9%

Student/ Lecturer (Full-time) Ratio

	2012	2013	2014	2015	2016
Total number of students	1123	1116	1051	847	728

Number of academic staff	200	190	190	185	135
Student/academic staff ratio	5.6	5.9	5.5	4.6	5.4

Total area per one student

	2012	2013	2014	2015	2016
Total area (m^2)	16.408	16.758	17.160	17.667	18.058,9
Total number of students	1.123	1.116	1.051	847	728
Surface of area per one student (m^2)	14,6	15	16,3	20,8	24,8

Number of auditoriums per one academic group

	2012	2013	2014	2015	2016
Number of academic groups	50	51	46	37	33
Number of auditoriums	38	42	45	48	54
Number of auditoriums per one academic group	0,76	0,8	1,98	1,3	1,6

Number of books per one student

	2012	2013	2014	2015	2016
Number of books	299.838	308.245	308.245	317.405	327.928
Total number of students	1.123	1.116	1051	847	728
Total number of books per one student in the libraries	267	276	293	374	450

This figure includes only the books available in the research organizations and don't include the books available in the Fundamental Scientific Library of NAS RA (3.000.000), though NAS RA students regularly make use of the services of the Fundamental Scientific Library.

Total number of computers

	2012	2013	2014	2015	2016
Total number of computers	46	56	106	109	109
Total number of academic staff	200	190	190	185	135
Total number of students	1123	1116	1051	847	728
Computer / academic staff	0.23	0.29	0.55	0.58	0.80
Computer/100 students	4.09	5.01	10.08	12.86	14.97

This figure only counts in the computers available in the comp labs, but it doesn't count in the labs located in the research organizations recorded on the balance sheet of the given research organization.

STRENGHTS	WEAKNESSES
• There is a gradual increase in the surface area which may be conditioned with the opening of new professions. The notable peculiarity of ISEC NAS RA us that all the department operate in a relevant research organization, where all the professional courses are taught, and the research organizations allocate area for administrative, teaching and learning purposes.	• Decrease in the full-time Master's degree programs by around 47%, which may be conditioned with the need of students to work and pay their tuition fee. • There is a tendency of the decrease in the number of academic staff which may be conditioned with the decrease in the students. Nevertheless, there has been increase in the number of lecturers with scientific degrees by 3.4%.

ANQA's recommendations to the Infrastructure and Resources at ISEC NAS RA[20]:

- To develop policy on the planning, management and monitoring of the activities of the Center in accordance with the financial resources.
- To develop mechanisms of financial resource allocation in line with strategic goals of the Center involving funding for the services directed to the healthcare and security assurance.
- To develop regulation on the administration and documentation of the Center.
- To review the mechanisms of evaluating the usage, availability and effectiveness of the provided resources involving there the mechanisms of needs assessment of the teaching staff.
- To take steps towards making the chairs of the Center accessible for the students with special needs in terms of organization of education.

7. Sources of Expertise

Sources of expertise. Potential cooperation partners and opportunities inside the country and internationally. Extract strengths/weaknesses.

The key state administrative bodies, that play a critical role in addressing environmental education needs in Armenia include:

The Ministry of Education, Science, Culture and Sport (MOESCS) is the state administrative authority in Armenia to develop and implement the policies of the government in the education and science sectors. It is also the ministry mandated by the government to implement the Law on Environmental Education. It is done by a separate organizational unit under the Division of Development Programs and Monitoring, which is also tasked to implement the Education for Sustainable Development Process and the Rio+20 process.

State Committee of Science*:* separated entity in the structure of the Ministry that implements the Government's policy in the field of science. The Committee seeks to develop scientific and technical capacity, its rationale and effective distribution and maintenance, scientific and technical personnel training, public intellectual potential reproduction, etc. The committee - chaired by the Deputy Minister of MOES - distributes grants for scientific researches on a competitive basis such as a grant given to the National Institute of Education of MOES in cooperation with the UNESCO Chair on "Education for Sustainable Development" to carry out trainings for lecturers and students from pedagogical institutes on raising competence in ESD key environmental topics.

[20] http://www.anqa.am/media/2589/gaa-expert-report.pdf

Other state administrative bodies have been involved in the implementation of Environmental Education (EE) including:

Ministry of Emergency Situations: The Ministry of Emergency Situations of the Republic of Armenia elaborates and implements the policy of the Government of the Republic of Armenia in the area under its management pursuant to the law of the Republic of Armenia, the main objectives of which are as follows: develop a unified state policy on civil defense and population protection in emergency situations, coordination, development of state regulation policies for displacement and sheltering processes and coordination of emergency response and disaster response measures, ensuring compliance with technical safety rules, coordination of those entities involved in international rescue operations in the Republic of Armenia, development of a system of disaster medicine, relief of seismic risk reduction measures, ensuring the implementation of regular and special observations, studies and forecasts of hydro-meteorological phenomena; formation, maintenance and servicing of State reserve stocks, etc.

Ministry of Environment: The Ministry of Environment of the Republic of Armenia is a central body of executive power that elaborates and implements the state policy in the field of environmental protection and rational use of natural resources.

Ministry of Healthcare: Responsible for elaboration and application of policy principles of sanitary protection zones of multi-purpose land use.

Ministry of Territorial Administration and Infrastructure: Elaborates policy provisions for approval of urban planning restrictions and norms, use of certain types of land according to RA Land Code. Responsible for European Landscape Convention, which is connected to the Framework Convention on Climate Change.

RA Regional Administrations has responsible divisions for education and environmental issues.

Besides state administrative authorities other government entities at national and regional levels, as well as local self-governing bodies, educational and civil public groups and organizations have also practical role and responsibility in the Environmental Education (EE) in Armenia, including:

State Museum of Nature of Armenia under the Ministry of Environment is unique in the region with its collections which include special items of biodiversity of Armenian flora and fauna, which have been preserved almost without changes since the last geological era, and that are extinct or rare and included in the Red Books of Armenia and in the International Society of Nature Protection. The collection reflects the peculiarities of Armenia's nature and the riches of the Earth.

State Inspection of Education: According to Article 37 of Law on Education, the Inspection is responsible for implementing the State Programme for Educational Development. This function is also regulated by the Law on State Inspection for Education; it includes applying state educational criteria, provides the right to education, and improves the quality of

education programmes.

National Institute of Education: Within the system of the Ministry of Education, Science, Culture and Sport the institute is responsible for retraining teachers, who need the qualification course in Ecology. Education experts in this institute also provide guidance in developing environmental education curricula for schools.

National Center of Educational Technologies: Educational portal – courseware, methodical, syllabi, non-fictions related to ecology.

Center for Education Projects: This center developed the environmental and social management framework within the context of preparing activities of the new Education Improvement Project. The framework was developed for assessing environmental and social risks of civil works in High Schools, which will be undertaken under the new project.

Civil Service Council of the Republic of Armenia: The Council was founded as a result of the public management reforms and anti-corruption policy with the purpose of implementing effective, joint personnel policy, providing professional, highly moral personnel to the state machine, over and above the correlation of the political forces, realizing the legal protection of civil servants and safeguarding their lawful interests. The division of Science and Education is the key customer in the country for training of civil servants.

Public Administration Academy: The mandates of this Academy are to develop specialists in the field of public administration; carry out theoretical and applied research activities in the field of public administration; ensure international academic cooperation; and supply informative/analytical materials in the field of public administration. In accordance with the Government Decree No 627, dated March 18, 2004 the profession of “Public Administration” was included in the list of RA higher education specialty. The strategic plan 2013-2018 includes the following educational programmes: Public Administration; Management (Public Finance Management); Law; Psychology (Psychology of Governance); and Political Science (Political Administration and Political Analysis). Currently, the PAARA is taking part in “Generate Global Environmental Benefits through Environmental Education and Raising Awareness of Stakeholders’ project funded by the GEF/UNDP: More details on the project are available at:
http://www.am.undp.org/content/armenia/en/home/operations/projects/environment_and_energy/generate-global-environmental-benefits-through-environmental-edu.html

National Center of Professional Education Quality Assurance: The center conducts external quality assurance processes in accordance with the norms set by the legislation and regulations, as well as with the European Standards and Guidelines. The center also develops guidelines, criteria and standards for Quality Assurance taking into account the local needs and international good practices.

National Training Fund: The National Training Fund reviews various educational models and recommends feasible options for Armenia.

Aarhus Centers: As the main instrument to implement the Aarhus convention in Armenia, there are 15 Aarhus centers in Yerevan and in the regions. These centers have produced environmental information and environmental education material; their main functions are environmental education, environmental information and raising public awareness. They conduct regular public environmental awareness activities throughout Armenia.

NGOs: More than 50 ecological NGOs

STRENGHTS	WEAKNESSES
	• The government pursues its policies to improve EE in Armenia; nevertheless, there is no clarification of institutional mandates, clear scopes of collaboration between the governmental bodies/departments and no clear source of funding.

APPENDIX 1

ENVIRONMENTAL PROTECTION AND NATURE MANAGEMENT INTERNATIONAL SCIENTIFIC EDUCATIONAL CENTER OF NAS RA

05/M06 Information Technologies in Environmental Research	3 ECTS
16/MO1 Professional Philosophical Issues	3 ECTS
18/MO1 English for Specific Purposes (English, German or French)	
04/MO2 Safety of Life Activity	4 ECTS
04/MO3 Essentials of Sustainable Human Development	4 ECTS
04/M10 Environmental Monitoring and Measurement	4 ECTS
04/M14 Ecotoxicology	4 ECTS
04/M17 Nature Recreation Management	3 ECTS
04/M58 Industrial Ecology	3 ECTS
RESEARCH	
Seminar with Scientific Supervisor	3 ECTS
English for Specific Purposes (English, German or French)	
04/MO1 Food Safety and Protection	4 ECTS
04/MO4 Issues of Emergency States	4 ECTS
04/MO5 Complex Geoecological Mapping	4 ECTS
04/M18 Ecology of Urban Environment	4 ECTS
04/M19 The Environment and Human Health	3 ECTS
04/M21 Research Logic	3 ECTS
08/M23 Ecological Expertise and Ecological Audit	3 ECTS
08/M18 Landscape Planning	3 ECTS
RESEARCH	
Seminar with Scientific Supervisor	3 ECTS
Research	4 ECTS
04/MO6 Spatial Information Systems and Management	4 ECTS
04/MO9 Environmental Geochemistry	4 ECTS
04/M11 Ensuring Analytical Basis for Nature Conservation Processes	4 ECTS
04/M59 Economics of Nature Use	4 ECTS

04/M22 Medical Ecology	3 ECTS
24. 04/M23 GIS Technologies in Nature Management	3 ECTS
RESEARCH	
Seminar with Scientific Supervisor	3 ECTS
Research	5 ECTS
RESEARCH	
Seminar with Scientific Supervisor	3 ECTS
Research	9 ECTS
Research Internship	3 ECTS
Pedagogical Internship	3 ECTS
Master Thesis Defense	12 ECTS

ENVIRONMENTAL PROTECTION AND NATURE MANAGEMENT MASTER DEGREE COURSE INTERNATIONAL SCIENTIFIC – EDUCATIONAL CENTER NATIONAL ACADEMY OF SCIENCES OF ARMENIA	
	LEARNING OUTCOMES
1	Relevant knowledge of modern/contemporary environmental problems, skills, and abilities of decision-making for the purpose of solving environmental problems
2	Relevant knowledge of natural and man-made hazards in the frames of 'Safety of Life Activities' course, as well as skills and abilities to protect from natural and man-made hazards.
3	Fundamental knowledge of emergency issues, as well as skills and abilities of organization and effective implementation of preventative measures and rescue actions in emergencies
4	Fundamental knowledge and the ability to use GIS systems and management, as well as fundamental knowledge and ability to use complex geo-ecological mapping in spatial planning research, masterful use of mapping methods
5	Relevant theoretical and applied knowledge of environmental geochemistry, abilities to assess ways, types, extents and risks of different components of environmental pollution
6	Comprehensive knowledge of up-to-date research methods in ensuring analytical bases of nature conservation processes and their application in field trips and labs
7	Relevant knowledge of environmental/ecological monitoring, abilities and skills to apply effective methods and assess findings/results in field trips and labs
8	Relevant and fundamental knowledge of the ecology of urban environment, identification of issues and development of tasks/assignments
9	Knowledge of main objectives, principles and mechanisms of economy of nature use and the ability to analyse results and make conclusions
10	Relevant knowledge of health risks of toxic substances in the environment and agricultural products and knowledge of main principles how to reduce and prevent the impact of these toxic substances
11	Abilities, skills and knowledge of up-to-date methods and techniques of carrying out research/scientific work

APPENDIX 2

ECOLOGY AND MANAGEMENT OF BIORESOURCES MASTER DEGREE PROGRAM

YEREVAN STATE UNIVERSITY

CORE SUBJECTS

Research Planning and Methodology	3 ECTS
Current Professional Issues credits	3 ECTS
RA Environmental Issues and Studies and Conservation of Biodiversity in Armenia	6 ECTS
Special Chapters of Biomedicine	6 ECTS
Dynamics and Sustainability of Ecosystems	3 ECTS
Environment and Human Health	3 ECTS
Environmental Impact Assessment and Expertise	3 ECTS
Ecological Risk Assessment and Management	6 ECTS
Bioresources: Sustainable Use and Management of Biodiversity	6 ECTS
Environmental Economics	3 ECTS
Hydrology and Management of Water Resources	3 ECTS
Land Ecology and Management	3 ECTS
Wastes and Their Recycling Technologies	6 ECTS
Biorecovery of Polluted Areas	3 ECTS
Sustainable Management of Agroecosystems	3 ECTS
Environmental Law	3 ECTS
GIS in Environment	3 ECTS

APPENDIX 3

ENVIRONMENTAL CHEMISTRY (ENVIRONMENTAL PROTECTION AND NATURE MANAGEMENT) MASTER DEGREE PROGRAM
ARMENIAN STATE PEDAGOGICAL UNIVERSITY
CORE SUBJECTS

Methodology of Pedagogical Research	3 ECTS
Inclusive Education	2 ECTS
Fundamentals of Environmental Expert Assessment	4 ECTS
Contemporary Paradigm of Natural Sciences	4 ECTS
Professional Psychology	3 ECTS
Scientific and Methodological Issues of Developing Ecotourism in Armenia	3 ECTS
Hydroponics and Selection	3 ECTS
Nature Use Management	2 ECTS
Pedagogical Anthropology	3 ECTS
Ways and Methods of Sustainable Management of Forest Ecosystems	3 ECTS
Theory and Practice of Sustainable Development	2 ECTS
Urban Ecology	2 ECTS
Logic	2 ECTS
Methodology of Environmental Research	2 ECTS

APPENDIX 4

ENVIRONMENTAL SCIENCES MASTER DEGREE PROGRAM
ARMENIAN STATE PEDAGOGICAL UNIVERSITY
CORE SUBJECTS

Fundamentals of Theoretical Ecology	3 ECTS
Chrono-ecology	2 ECTS
Fundamentals of Chronological Expert Assessment	4 ECTS
Contemporary Paradigm of Natural Sciences	4 ECTS
Professional Psychology	3 ECTS
Scientific and Methodological Issues of Developing Ecotourism in Armenia	3 ECTS
Hydroponics and Selection	3 ECTS
Nature Use Management	2 ECTS
Pedagogical Anthropology	3 ECTS
Ways and Methods of Sustainable Management of Forest Ecosystems	3 ECTS
Theory and Practice of Sustainable Development	2 ECTS
Urban Ecology	2 ECTS
Logic	2 ECTS
Methodology of Environmental Research	2 ECTS
International Cooperation in Environment and Nature Management	2 ECTS

APPENDIX 5

ENVIRONMENTAL SCIENCES MASTER DEGREE PROGRAM
GAVAR STATE UNIVERISTY
CORE SUBJECTS

Methodology of Scientific Research	3 ECTS
Contemporary Issues of Ecology|	3 ECTS
Anthropogenic Sources of Air Pollution	3 ECTS
Foreign Language (Major in English)	3 ECTS
Genetic Engineering	3 ECTS
Current Problems of Organic Agriculture	3 ECTS
The Environment and Human Inheritance	3 ECTS
Current Problems of Industrial Waste Prevention	3 ECTS
Information Technologies in Professional Research	3 ECTS
Seminars on Research	3 ECTS
Basics of Efficient Usage and Preservation of Land Resources	3 ECTS
Applied Ecology	3 ECTS
Ecological Mapping	3 ECTS
Anthropogenic Influence Monitoring on Environment	3 ECTS
Ecological Regularities of Evolution	3 ECTS
Social Ecology and Culture	3 ECTS
Basics of Environmental Epidemiology	6 ECTS
Biodiversity Protection Issues (by Example of Sevan Catchment Basin)	3 ECTS
Seminars on Research	3 ECTS
Research Work	3 ECTS
Technogenic Systems and Ecological Risk	3 ECTS
Contemporary Issues of Agroecology	3 ECTS
Ecological Aspects of Rational Use of Nature	3 ECTS
Relations between Society and Nature in the History of Civilization	3 ECTS
Problems of Climate Change and Desertification	3 ECTS
Ecological Microbiology	3 ECTS
Modern Aspects of Ferment Treatment	3 ECTS
Seminars on Research	3 ECTS
Research Work	6 ECTS

Seminars on Research	3 ECTS
Research Work	3 ECTS
Research and Pedagogical Internship	3 ECTS
Research Internship	3 ECTS
Master's Thesis Defense	12 ECTS