Summary report on research accreditation

I. General information

Name of organization	**Institute of Geology and Seismology of ASM**
Organization type (*to underline*)	Research institute Higher education institution Ministerial research institute
Research direction (s) of organization	- Seismic hazard and risk studies; - Study of mineral resources and protection of geological environment.
Correlation with strategic research direction (s) of activity in the field of science and innovation for 2013-2020	- Materials, technology and innovative products
Evaluated period	2010-2014
Web of organization	www.igs.asm.md

II. Research capacity (annual average for evaluated period)

Total number of employees	**84.1**					
Number of scientific researchers	**24.6**					
Number of researchers who possess honorific titles, scientific degrees, scientific and scientific-didactical titles	ASM full members -	ASM corresp. members -	Professor -	Associated Professor **6.4**	Dr.hab. **1.8**	Dr. (PhD) **11.2**
Number of researchers involved in international projects	European Commission Programmes **5.8**	United Nations Programmes and Funds **-**	Bilateral Programmes financed from the national budget **3.6**	Others **-**		
Number of young researchers (under 35 years old)	PhD students **4.8**		Others **7.8**			
Financial resources - revenues (thousand MDL)	Public budget **5587.4**		Special means **1514.6**			
Categories of special means (thousand MDL)	National **666.3**		International **848.3**			
Distribution of expenditures (thousand MDL)	Salary **3552.0**	Procurement of scientific equipment **596.8**	Traveling for scientific purposes (travel, accommodation, per-diems, etc.) **179.7**	Other **757.3**		
List of 3 basic research methods, equipments, technologies (per accredited field)	1. Network of seismic stations of the Republic of Moldova; 2. Gas Chromatography; 3. Atomic Absorption Spectrophotometer.					
List of provided	Seismic microzonation of urban areas, seismicity of areas for construction					

scientific services	works of special importance; Estimation of seismic conditions of areas with complicated geotechnical conditions; Recommendations for reducing the effects of industrial explosions in quarries on the environment and constructions; Measuring of the amplitude of seismic waves, oscillations of different origin and the localization of their sources; Estimation of the dynamic characteristics of various types of constructions (buildings, bridges, etc.); Estimation of the quality of mineral and potable water by standard methods; Analysis of complex organic compounds (POPs, PAHs, pesticide) in different environments: natural water, waste water, soils, foods, etc.; Determination of toxic elements (As, Se, Hg, Pb, Cd, Cu, Zn, Ni, Cr, Al, Mn, Fe) in different objects: natural and waste waters, foods, farm products, soils, sediments of waste water, metals and alloys; Scientific support for implementation of the new techniques of use of the local mineral resources.
List of editorial activities	Journal of the Institute of Geology and Seismology of the Academy of Sciences of Moldova ISSN 1857-0046 www.igs.asm.md/node/15

III. Distribution of the number of research projects and themes during the evaluated period

ASM institutional projects	2010 **5**	2011 **4**	2012 **4**	2013 **4**	2014 **4**
ASM projects in the frame of State Programmes	2010 **2**	2011 **2**	2012 **2**	2013 **4**	2014 -
ASM technological transfer projects	2010 **1**	2011 -	2012 -	2013 -	2014 -
ASM projects for equipment procurement	2010 -	2011 -	2012 -	2013 -	2014 -
ASM projects for young researchers	2010 -	2011 -	2012 -	2013 -	2014 **1**
ASM projects in the frame of bilateral programmes	2010 -	2011 **1**	2012 **1**	2013 **1**	2014 **1**
International projects/grants	2010 -	2011 -	2012 **1**	2013 **2**	2014 **2**
List of 3 representative international projects/grants	1. BLACK-Sea: Black Sea Earthquake Safety Net(work) – ESNET, Project manager: ALCAZ Vasile, doctor habilitatus. Budget 100,300,0 Euro, Years 2012-2014. 2. Joint Operational Programme Romania-Ukraine-Republic of Moldova 2007-2013: „Cross-border interdisciplinary cooperation for the prevention of natural disasters and mitigation of environmental pollution in Lower Danube Euroregion" MIS ETC 1676. Project manager: BOGDEVICI Oleg, doctor. Budget for IGS 292,000,0 Euro, Year 2013-2015				

Research contracts	2010 **8**	2011 **7**	2012 **10**	2013 **21**	2014 **7**
List of 3 representative research contracts	1. Identification of potential geological structures for underground gas storages on the territory of the Republic of Moldova. S.A. "Moldova GAZ", 2010-2011; 2. Microzonation map of Cahul urban area. Minister of Regional Development and Constructions; 3. Identification of polluted areas with POPs. NGO Ecos.				

IV. Scientific publications

Total number of publications abroad	Books **3**	Chapters in books **4**	Journal papers **143**	Conference abstracts **78**
Total number of publications in ISI journals and books	Books -	Chapters in books **2**	Journal papers **13**	
Total number of publications in the country	Books **3**	Chapters in books **2**	Journal papers **130**	Conference abstracts **36**
List of 5 representative publications (per accredited field)	1. ENE A., **BOGDEVICH O.,** SION A. Levels and distribution of organochlorine pesticides (OCPs) and polycyclic aromatic hydrocarbons (PAHs) in topsoils from SE Romania. *Science of the Total Environment, 439, 2012*, pp. 76 -86 (IF 3,29) 2. ENE A., **BOGDEVICH O.,** SION A., SPANOS Th. Determination of polycyclic aromatic hydrocarbons by gas chromatography-mass spectrometry in soils from Southeastern Romania. Microchemical Journal, 2011, Vol. 100, pp. 36 – 41. (IF 2,48) *3.* D'AMICO S., ORECCHIO B., PRESTI D., NERI G., WU W.-N., **SANDU I.**, HERRMANN R.B., Source parameters of small and moderate earthquakes in the area of 2009 L'Aquila seismic sequence (central Italy), *Physics and Chemistry of the Earth*, March (2013), ISSN 1474-7065 doi:10.1016/j.pce.2013.02.005, IF=1,33; 4. KRONROD T., RADULIAN M., PANZA G., POPA M., PASKALEVA I., RADOVANOVICH S., GRIBOVSKI K., **SANDU I.,** PAKEVSKI L., Integrated transnational macroseismic data set for the strongest earthquakes of Vrancea (Romania), *Tectonophysics* 590 (2013), ISSN 0040-1951 p. 1-23; IF=2.6; 5. TELESCA Luciano, **ALCAZ Vasile, BURTIEV Raşid, SANDU Ilie.** Time-clustering analysis of the 1978-2008 sub-crustal seismicity of Vrancea region. Journal *Natural Hazards and Earth System Scieces, 2011, pp.2335-2340.* ISSN: 1561-8633, (IF: 1,792)			
List of 5 citations	1. NICOARA I. Fossil representatives of the superfamily Sciuroidea (Rodentia) From Upper Turolian of Republic of Moldova. *Acta Palaeontologica Romana*, Vol. VII, Cluj-Napoca, 2011, p. 257-265. (4 citations https://scholar.google.com/scholar?cites=5435276485307000502&as_sdt=2005&sciodt=0,5&hl=ru) 2. SANDI, H., APTICAEV, F., BORCIA, I., ERTELEVA, O., **ALCAZ, V.** Quantification of Seismic Actions on Structures. *AGIR Publishing House*, Bucharest, 2010, 211p. ISBN 978-973-720-319-9 (5 citations			

	https://scholar.google.com/scholar?oi=bibs&hl=ru&cites=8848286499788923452&as_sdt=5) 3. TELESCA L.**, ALCAZ V., SANDU I.** Analysis the 1978–2008 crustal and sub-crustal earthquake catalog of Vrancea region. Journal *Natural Hazards and Earth System Scieces, 2012, pp.1321-1325.* ISSN: 1561-8633, (3 citations https://scholar.google.com/scholar?oi=bibs&hl=ru&cites=961925661063673379&as_sdt=5) 4. ENE A., **BOGDEVICH O.,** SION A. Levels and distribution of organochlorine pesticides (OCPs) and polycyclic aromatic hydrocarbons (PAHs) in topsoils from SE Romania. *Science of the Total Environment, 439, 2012,* pp. 76 -86 (14 citations https://scholar.google.com/scholar?oi=bibs&hl=ru&cites=6016079474043770407) 5. BURTIEV R. Evaluation of seismic hazards from several seismic zones. *Environmental Engineering and Management Journal.* N12, 2012. p. 2141-2150 ISSN 1582-9596 Impact Factor IF=1.004 (3 citations https://scholar.google.com/scholar?cites=8553793877374553032&as_sdt=2005&sciodt=0,5&hl=ru)

V. Innovation outputs

Total number of patents	Registered in the country -	Registered abroad -	Implemented -
Total number of new developed methods and technologies	Registered **3**	Non-registered **6**	Implemented **2**
Total number of new scientific products	Registered **5**	Non-registered **10**	Implemented **5**
List of 5 representative innovation outputs (per accredited field)	1. Identification of six potential geological structures for gas storage 2. Map of microseismic zonation of the territory of Cahul city. 3. Map of seismic risk for Cahul urban area. 4. GIS - methodology for geological data use in urban areas. 5. Mapping of ground water of Republic of Moldova, integrated in Ground water map of Europe.		

VI. Other outputs

Total number of scientific outputs for central and local authorities (draft of law, strategies etc.)	6		
Total number of scientific outputs for educational institutions	Handbooks for higher education -	Handbooks for pre-university institutions -	Number of researchers – supervisors of license and master theses **6**

VII. Major scientific and innovation achievements

Short description of main scientific results and their confirmation	In the result of the study of dynamics of seismic processes in the Vrancea region, it was established the existence of temporal clustering phenomenon specific period pronounced for earthquakes "aftershock".

<table>
<tr><td>(by awards, citations, development of international projects etc.)</td><td colspan="5">This means independence, lack of memory, temporal correlation of sub-crustal seismic events generated by Vrancea source (results were published in the Journal of natural hazards and earth system sciences, IF: 1,792).
The algorithm and soft for evaluation of seismic danger from several sources, based on 4D marcovian model for seismic zone, were elaborated (results were published in the Environmental Engineering and Management Journal, IF=1,004).
A set of unified regional macroseismic data, which has been generated based on macroseismic field continuously strong earthquakes in Vrancea of the XX century, was developed (results were published in Journal of Tectonophysics, IF =2,6)
Statistical analysis of field of mechanical tensions, evaluate base on data of set of fault- plan for 247 earthquakes shown that for 91% of intermediate earthquake source mechanism is same base on subduction. This result will help to better understanding of particularities of seismicity of this zone (results were published in the Journal of natural hazards and earth system sciences, IF: 1,792).
The methodology for identification, delimitation and classification of water bodies was elaborated (methodology was approved by Government Decision nr. 881 from 7 November 2013).
Six geological structures that may have prospects for construction of the underground gas storages were discovered, but they need additional investigation in order to confirm or reject theirs prospects.
Perspective areas for oil and gas prospection from South-west part of the Republic of Moldova were propose (results were presented to the Government))</td></tr>
<tr><td rowspan="2">Number of researchers invited as speakers at international conferences</td><td>2010</td><td>2011</td><td>2012</td><td>2013</td><td>2014</td></tr>
<tr><td>3</td><td>5</td><td>3</td><td>4</td><td>8</td></tr>
<tr><td>Short description of technological transfer and innovation results and their certification by implementation</td><td colspan="5">In the frame of the project 08.164.77T, the technology for processing of local natural bentonite, aiming the preparation of sorbent for national economy, was developed.</td></tr>
<tr><td rowspan="2">Number of defended dr./dr. hab. theses per year</td><td>2010</td><td>2011</td><td>2012</td><td>2013</td><td>2014</td></tr>
<tr><td></td><td>-</td><td>-</td><td>3</td><td>1</td></tr>
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VIII. Present/further involvement in the Horizon 2020 (FP7)

In 2015 the Institute of Geology and Seismology submitted a project within the call H2020-ISSI-1-2015 - *Pan-European public outreach: exhibitions and science cafés engaging citizens in science* (Horizon 2020 Programme). The project was not selected for funding.

IX. Accredited research field and its evaluation (very good/good/ satisfactory) by the National Council for Accreditation and Attestation of the Republic of Moldova

Geology and seismology - good.

X. Category (A/B/C) attributed by the National Council for Accreditation and Attestation of the Republic of Moldova to the organization

Category B

XI. Institutional development actions planned for the next 5 years (maximum ½ page)

In the period of 2015-2018 the Institute will be conduct research under the strategic directions 02. "Materials and innovative products" with next major priority:

1) Study in order to improve the seismic security;

2) Geological and hydrogeological studies in order of effective management of mineral resources and protection of geological environment.

The most important action at this time will be:

1) Research and Innovations;

2) Schooling of staff;

3) Extension of international relations;

4) Improvement of publishing activity;

5) Development of Logistics;

6) Optimization of research activities.