ECOARM2ERA

PROJECT FINAL REPORT

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Final publishable summary report

An executive summary

EcoArm2ERA project as FP7 Supporting Action was aimed at strengthening the cooperation capacities of the Armenian leading research institute in the area of environment protection and monitoring: Center for Ecological-Noosphere Studies of National Academy of Sciences of the Republic of Armenia (CENS).

To achieve this goal, EcoArm2ERA brought together two leading research institutes from the EU (UCD and UNIGE), as well as experts in local research strategy (National Academy of Sciences of the Republic of Armenia) and in FP7/Horizon2020 training and project management (GIRAF) – each of them played a fundamental role in reinforcing CENS' capacities and integration into ERA.

This overall goal was achieved through the following specific objectives:

1. **Objective1:** To define and promote a sustainable development strategy for the Armenian CENS focussing on the overall improvement of the institution's capacities, visibility, and competitiveness.
2. **Objective 2:** To develop a strategic partnership between CENS and (i) the Earth Institute, University College Dublin (UCD)**,** and (ii) the Institute for Environmental Sciences, University of Geneva (UNIGE). To build CENS' capacity to acquire and carry out international collaborative research partnerships.
3. **Objective 3:** To build the competencies needed by Armenian researchers and staff members in order to participate in the FP7/Horizon 2020 programmes.

Clearly significant results achieved have been:

1. **Strategy Development Agenda (SDA) for CENS.** Based on SWOT analysis the SDA was developed for CENS with clear recommendations for capacity building and Internationalization. The SWOT analysis revealed CENS ambitious capacities and research priorities, which makes it possible for CENS to become Government's expert body and service provider highlighting the central role in Armenia and in the region.
2. **Capacity building.** Capacity building of the department of GIS and Remote sensing technologies of CENS totally improve of working environment of the staff, which notably increase envisages emphasizing those of young researchers.
3. **Joint research.** The partnership of CENS with European partner organizations that was started around the activity of developing environmental observation and spatial decision support system (SDSS) as defined in the plan of the joint research, was developed through planning and implementing joint research projects.
4. **Raised visibility of CENS and strong ties with leading European organizations.** Among the various ways of promoting CENS internationalization, two were realized during the implementation of EcoArm2ERA project: (i) integration of CENS into main international initiatives (Group on Earth Observations, Open Geospatial Consortium), (ii) integration into the European scientific consortiums (research "families") of ongoing projects, which enabled to be acquainted not only to the new research methodologies, but also to provide new use cases for joint research.

A summary description of project context and objectives

INTRODUCTION

Few organizations deal with environment-related research in Armenia. CENS is an active group with strong leadership carrying out fundamental and applied studies in ecology and environment protection. Multidisciplinary investigations performed in the CENS are oriented to the complex assessment of ecological state of territories and development of scientific-and-methodical fundamentals of ecological expertise and optimization of natural resource management processes. CENS includes a number of problem-oriented laboratories and research teams dealing with environmental geochemistry, biogeochemical cycles, bio-monitoring, radioecology (primary data have systematically been collected since 1958), bio-energy, landscape planning, geo-pathogenic zones, GIS and Remote Sensing technologies. CENS is an absolutely central player in the field of environment research in Armenia and the region. Thus, building research cooperation capacities of CENS the EcoArm2ERA project delivered a systemic impact on the entire system of environment research of Armenia and brings the Armenia science systems closer to ERA.

EcoArm2ERA project consortium:

N	Name	Country
1. [CO]	CENTER FOR ECOLOGICAL-NOOSPHERE STUDIES NAS RA	Armenia
2.	UNIVERSITY COLLEGE DUBLIN, NATIONAL UNIVERSITY OF IRELAND, DUBLIN	Ireland
3.	UNIVERSITE DE GENEVE	Switzerland
4.	GIRAF PM Service GmbH	Germany

MAIN GOAL

Thus, the main goal of EcoArm2ERA project was *to reinforce the cooperation capacities of Armenia's leading research institute in the field of environmental research and ecology* – Center for Ecological-Noosphere Studies of National Academy of Sciences of the Republic of Armenia *(CENS).*

This overall goal was achieved through the following specific objectives:

To define and promote a sustainable development strategy for the Armenian CENS focussing on the overall improvement of the institution's capacities, visibility, and competitiveness.

To develop a strategic partnership between CENS and (i) the Earth Institute, University College Dublin (UCD)**,** and (ii) the Institute for Environmental Sciences, University of Geneva (UNIGE). To build CENS' capacity to acquire and carry out international collaborative research partnerships.

To build the competencies needed by Armenian researchers and staff members in order to participate in the FP7/Horizon 2020 programmes.

MAIN ACTIVITIES

According to the timeline the following activities were performed within the scope of the main five Work Packages

1. WP1 - STRATEGY

WP1 was divided into two main tasks

SWOT analysis - The core of this activity was concerned with conducting SWOT analysis and creating Strategy Development Agenda (SDA) for CENS. Strategy Working Group was organized, which includes one representative from each partner-organization: CENS NAS RA, NUID UCD and UNIGE as well as NAS RA and State Committee of Sciences of the Ministry of Science and Education of Armenia for policy relevance. SWOT analysis required numerous questions to be answered, which are useful for the development of an action plan. The questionnaire designed included different types of questions: (i) an open format (ii) dichotomous questions (iii) Rating questions and aimed to the main domains of CENS

- *Research (focus and structure/quality and success),*
- *Resourcefulness,*
- *Management efficiency,*
- *Financial resources/funding opportunities,*
- *Partnership*

Strategy development Agenda - Following the conduct of SWOT analysis all materials were collected and carefully evaluated and analysed, and the Strategy Development Agenda (SDA) for CENS was developed. In accordance with the ongoing reforms in Armenia, the strategy gave clear recommendations for capacity building and internationalization as to how CENS should improve the research focus and structures with regard to links with other institutes to meet CENS' challenges.

2. WP 2 – TWINNING

This objective implied to develop strategic partnership between CENS and European partner organizations UCD as well as UNIGE. It was attained through the development and implementation of a joint research plan as well as through the conduct of a joint scientific workshop and a summer school.

Joint research plan - The development and implementation of the Plan for Joint Research was based on the areas of scientific excellence and capacities of CENS that were identified during the SWOT analysis. It was aimed at developing environmental observation and spatial decision support system (SDSS), which covered five main sub activities:

- *Remote observation systems of the main environmental compartments (water, soil and plants).*
- *Detection and prediction of land-use changes and spatial planning.*
- *Urban geochemical peculiarities and public awareness.*

- *Improvement of grasslands environment and quality of feedstuff.*
- *Environment and food chains risk assessment*

Each of these areas represented an opportunity for a dedicated research project with the detailed plan of joint research and dissemination activities in accordance to upcoming funding opportunities.

Joint scientific workshop - Joint scientific workshop "***Integration of Spatial Decision Support Systems and Evidence Based Modeling in National/Regional Policy Applications and Regulatory Systems: Scientific and Policy Challenges***" was organised by NUID UCD in Dublin in July 9-12, 2013. The objective of this workshop was to develop best practice evidence of both analytical tools and policy applications available in Europe, Canada and New Zealand. The workshop was collocated with international congress on Planning for Resilient Cities and Regions organised in University College Dublin in 15th - 19th July 2013 (http://aesop-acspdublin2013.com).

EcoArm2ERA's summer school - Summer school entitled ***"Bridging ICTs and Environment - Spatial Planning and Environmental Assessment for Decision Making in Europe"***, held at the Central European University (CEU) in Budapest, Hungary, 7-11 July 2014. The goal was to establish initial contacts and to foster collaborative ties between young researchers (mainly PhD level, PostDoc, and young researchers) from both Armenia (selected by CENS) and the EU (UCD, UNIGE, and other institutions).

Networking with European partners via association membership to the pan-European research consortiums - Since 2011 Armenia has been participating to national and international initiatives in order to use the mechanisms and tools of geospatial data processing, storage and sharing provided by e-infrastructures, thanks to technical and institutional support of UniGE. That was resulted in CENS integration into two huge global initiatives - ***Open Geospatial Consortium (OGC)*** and the ***Group on Earth Observations (GEO)***.

3. WP 3 – TRAINING

The attainment of this objective is achieved through two measures: (i) the conduct of two training FP7/HORIZON2020 workshops and (ii) the set-up and implementation of a coaching scheme for the research administrators and other relevant staff members of CENS. The FP7/HORIZON2020 training workshops comprised a session to raise the awareness among the participating Armenian researchers on EU priority research areas and upcoming cooperative funding opportunities in FP7/HORIZON2020.

4. WP 4 – COORDINATION & DISSEMINATION

During the lifetime of the project the Project web-site has been created and updated regularly by CENS highlighting the main outputs, news and event of the project (www.ecoarm2era.eu). Special attention was given to the dissemination activities within EcoArm2ERA. Dissemination strategy was

based on to present the general idea of the project to the target group members, related organizations, stakeholders and public. Design and development of all promotional materials were handed out at the events and through the partners by CENS. EcoArm2ERA poster and leaflet was created, which was disseminated and delivered in the international research events and meetings.

5. WP 5 – MANAGEMENT

Taking into account the relatively small size of the project, the management structure is as simple as possible, but as comprehensive and specialized as necessary to successfully meet the requirements of the different aspects of project management (Fig. 1).

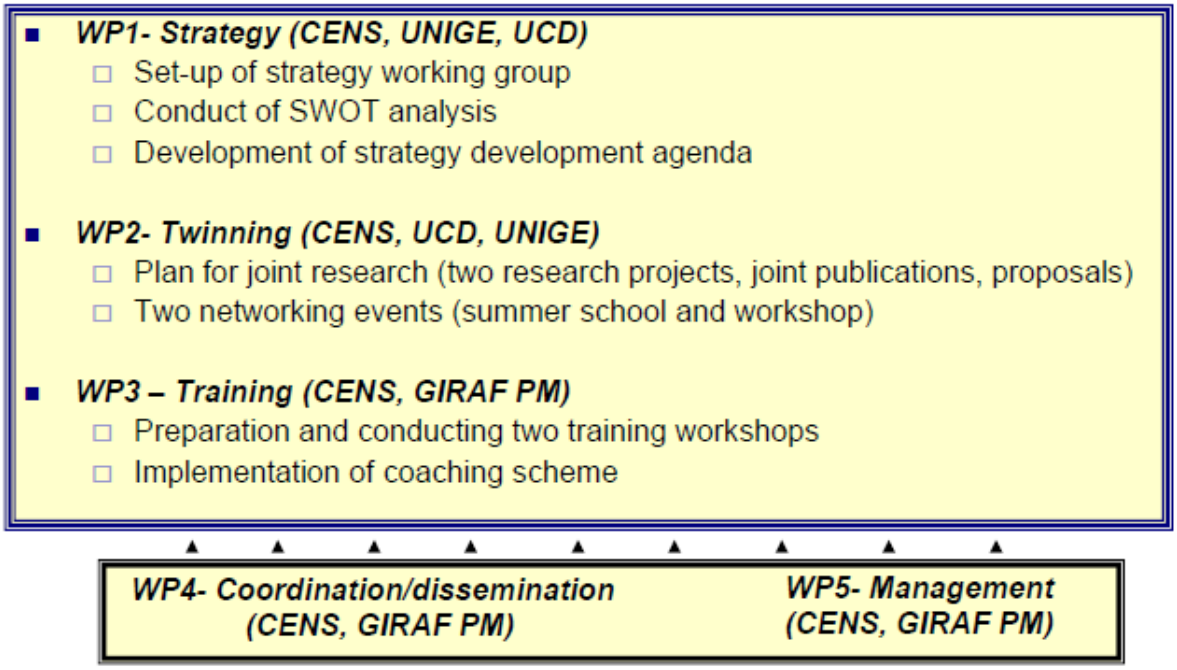

Figure 1: *Work packages and the structure of EcoArm2ERA project*

The main S&T results/foregrounds

The objectives stated for the project went in line with the overall aim of the project. The work plan has proceeded according to the schedule that has been outlined. The work involving all the consortium members (NUID UCD, UNIGE and GIRAF PM). The start of the project have been done by the first meeting (kick-off meeting).

Kick-off meeting

Kick-off meeting took place in Yerevan on February 27-28, 2012, at CENS, where the main tasks and various issues of the project were discussed and agreed. The meeting had two sessions: welcome session chaired by the Vice-President of the National Academy of Sciences of Armenia was aimed to meet the consortiums of the three EU FP7 projects (EcoArm2ERA, IPERA and INARMERA-ICT) funded by the European Commission and European Commission Project Officer (PO), who was welcomed by Chairmen of the State Committee of Sciences of the Ministry of Education of Sciences of Armenia, Deputy Minister of Economy of Armenia, Director, CNRS Moscow Office and Cooperation Attaché, of the Embassy of France to Armenia (fig.2). The next session was conducted at CENS, where the members from all partner organizations (CENS, NUID UCD, UNIGE, GIRAF PM) were participated. The latter started by a short excursion at CENS with purpose to be introduced the participants to the research activities of main departments of CENS (fig.3).

Fig. 2 *Welcome session in the National Academy of Sciences of RA*

Fig. 3 *EcoArm2ERA's welcome session at CENS*

The main work performed during the reporting period will be described for each work package.

Sustainable strategy for CENS

In order to identify the key internal and external factors that are important for strategic planning SWOT analysis for CENS should be conducted. For this purpose Strategy Working Group (SWG) was organized, which included one representative from each partner-organization: CENS NAS RA, NUID UCD and UNIGE as well as NAS RA and State Committee of Sciences of the Ministry of Science and Education of Armenia for policy relevance. SWOT analysis requires numerous questions to be answered, which are useful for the development of an action plan. The questionnaire designed included different types of questions: (i) an open format (ii) dichotomous questions (iii) Rating questions. The questions were addressed to already identify relevant administrative and scientific staff members of CENS NAS RA and potential stakeholders listed in schedule of SWOT analysis and aimed to the main domains of CENS

- Research (focus and structure/quality and success),
- Resourcefulness,
- Management efficiency,
- Financial resources/funding opportunities,
- Partnership

Interviews scheduled with stakeholders from the governmental organizations (State Committee of Sciences RA, Ministries of Agriculture, Municipalities etc.) as well as NGO-s, Aarhus Centers in Armenia and International organizations such as OSCE office in Yerevan were meant to have a general overview of a potential market of "scientific product", to identify and seize opportunities of its extension and further development of CENS NAS RA.

SWOT analysis revealed CENS ambitious capacities and research priorities, which makes it possible for CENS to become Government's expert body and service provider highlighting the central role in Armenia and in the region. CENS offers multidisciplinary research developments and

services that are of special interest to state-governmental and international research organizations and authorities for decision-making.

According to the strategy of CENS development it is important for CENS to maintain close ties with international institutions and organizations for scientific development.

Among the various ways of promoting CENS internationalization, two were realized during the implementation of EcoArm2ERA project:

- Integration into the European scientific consortiums (research "families") of ongoing projects, which enabled to be acquainted not only to the new research methodologies, but also to provide new use cases for joint research.
- Integration of CENS into main international initiatives (Group on Earth Observations, Open Geospatial Consortium, etc.)

Capacity building and joint research

Since 1990-s of special interest in environmental research carried out by CENS are E-science tools widely employed when managing ecological issues. Geographic Information System (GIS) and Remote Sensing (RS) technologies are the main tools promoting the development of novel techniques of operative assessment of the status and dynamics of environmental systems. Based on results of the SWOT analysis the partnership of CENS with European partner organizations, started around the activity of ***developing environmental observation and spatial decision support system*** (SDSS), which covered five main sub activities:

- *Remote observation systems of the main environmental compartments (water, soil and plants).*
- *Detection and prediction of land-use changes and spatial planning.*
- *Urban geochemical peculiarities and public awareness.*
- *Improvement of grasslands environment and quality of feedstuff.*
- *Environment and food chains risk assessment*

Each of these areas represented an opportunity for a dedicated research project with the detailed plan of joint research and dissemination activities in accordance to upcoming funding opportunities.

The Swiss-Armenian ARPEGEO 2011-2013 (SCOPES-International Partnership) project started, simultaneously with EcoArm2ERA and successfully coordinated by UNIGE, which stimulated the capacity building of the department of GIS and Remote sensing technologies of CENS totally improving working environment of the staff and notably increasing envisages emphasizing those of young researchers. CENS was equipped with Geoserver on which a suite of open-source GIS software were installed (GeoServer, GeoNetwork, OpenLayers), which enables CENS to be one of the key providers of geospatial environmental data in Armenia. With the server on-site, the CENS can efficiently manage its growing set of geospatial data and can serve data to its various stakeholders in an efficient manner.

The partnership of CENS with European partner organizations started around the activity SDSS was continued through:

- Developing joint research projects
- Organizing exchanges of students and joint research and conducting joint events

- Networking with European partners via association membership to the pan-European research consortiums

CENS had the opportunity to be part of a large European consortium lead by UNIGE that bid for the FP7 call FP7-ENV-2013.6.3-3, with the so-called ***enviroWATERS*** proposal. The other consortium CENS was involved in, with the support of GIRAF PM that prepared and submitted one more ***R2I-MA*** proposal to the other FP7 call: FP7-INCO-2013-9, Activity 7.9. CENS was involved also in two Swiss-driven consortia bidding for calls from the Swiss National Science Foundation. The first one called ***RESPONSE*** was bidding for a Joint Research Project (Armenia-Switzerland) within the SNSF SCOPES 2013-2016 program. The second one was a large NCCR (National Center of Competence in Research), called ***ENVISAGE*** (ENVironmental ISsues Addressed through innovative Governance. ESA Quotation ITT AO/1-7563/13/NL/EM). Unfortunately, the two bids did not succeed.

Finally, UNIGE helped CENS to be part of the Advisory Board of a successfully ESA-funded project called ***WATERLENS*** ("Water Availability – Improved Monitoring, Forecasting and Control of Water Availability, Quality and Distribution") in which UNIGE is partner. This was a great opportunity to interact with a highly skilled consortium in the area of Earth Observation.

The other integral part of the joint research plan was the planning of the mobility of researchers (schedule for the exchange of the researchers). Thus, student exchanges were developed and carried out between CENS (Environmental Geochemistry Department) and University of Geneva (Institute F.A. Forel).

Fig. 4 *Master student from UNIGE Ms. Valerie Parietti (left) and PhD student from CENS Ms. Nairuhi Maghakyan (right)*

This exchanges aimed to assess heavy metal pollution levels, to evaluate the bioaccumulation and toxicity of metals of Armenian rivers impacted by mining activities. For this purpose a master student from UNIGE (Ms. Valérie Parietti) visited Armenia twice (19-29.04.2014 and 04-14.06.2014) for field and lab works. A PhD student form CENS (Ms, Nairuhi Maghakyan) visited (17.05-04.06.2014) UNIGE to study and to carry out lab works (fig. 4).

This student exchanges will allow writing a Master thesis at UNIGE and will likely allow for a joined scientific paper between CENS and UNIGE. These exchanges can serve as a good basis for further collaboration and future projects bringing together the bioremediation methods that UNIGE has developed for solving the environmental pollution issues CENS has revealed in Armenia.

The other visit was planned in frame of ***EU-FP7 TURAS*** and ***EU-FP7 EcoArm2ERA*** projects collaboration. The new use case approach was agreed to share and present GIS datasets covering Yerevan city using the data sharing and online mapping tools developed in scope of TURAS project. 5 researchers from CENS have visited UCD in May 20-31, 2014 (fig. 5). During this visit they have been introduced with the research works implemented at UCD in scope of Urban Environment Project (www.uep.ie) to adapt, calibrate and apply the land use model MOLAND for the Greater Dublin Region.

Through the practical workshop the participants have been trained to run the model using the datasets covering Yerevan city. Simple scenario simulations have been implemented to demonstrate the usefulness of this kind of research output for planners and decision makers as well as its potential value for Armenia.

Fig.5 *CENS's researchers testing the model using the datasets covering the city of Yerevan*

Networking with European partners via associated membership to pan-European research consortiums and integration into global initiatives.

EcoArm2ERA started collaboration with the EU-FP7 EOPOWER project, which aimed to present Armenia as a pilot study and CENS is central to this pilot. The main goal of this use case is to apply the EGIDA methodology, thus contributing to institutional capacity building in order to make Earth Observation resources optimally used towards sustainable development in Armenia. The main mean to reach this goal is to apply, assess and consolidate a set of practices for a sustainable contribution to the Global Earth Observation System of Systems (GEOSS). The roadmap was

prepared, which included specific actions and guidelines to implement for the Armenian study. Based on EGIDA actions (networking and technical) and guidelines already selected by working group. Though the actions have already been taken starting from April 2014, CENS have been entered into the main stream since 2011 when Swiss-Armenian SCOPES "ARPEGEO" project (collaboration between UNIGE and CENS) have been started. As mentioned above, in the framework of ARPEGEO project CENS deployed the first environmental data sharing and interoperability services in Armenia. Strengthening the national capacities of geospatial data sharing increased the visibility and national position of CENS as an expert in environmental research, and expended their regional and international networks in this field. The geospatial and environmental data sets and their associated metadata existing at CENS were integrated into an SDI by adopting the international standards from the Open Geospatial Consortium (Web Map Service (WMS), Web Feature Service (WFS), Web Coverage Service (WCS)) and from the International Organization for Standardization (ISO 19139, 19115). Web Processing Services (WPS) were also developed at IIAP to compute a set of vegetation indices on user-defined satellite images. Eventually the data sets has been prepared to register into GEOSS, which enhanced the visibility for the availability of Armenian geospatial datasets on the regional and global scenes and further the integration of Armenia as a full member of GEO. For this aim, the Government of Armenia started the official negotiations with GEO Secretariat. Eventually, in October 2014 Armenia became an official member of GEO and appeared with official statement in GEO XI Plenary held in Geneva, Switzerland 13-14 November 2014 (fig. 6).

Fig. 6 *GEO XI Plenary Session: Armenia's first appearance as a 94th GEO member nation.*

Another step towards CENS internationalization was CENS full membership to the Open Geospatial Consortium (OGC), which will help CENS to find niches meeting many data/ service providers and to raise the market awareness.

CENS became also an associative member of:

- EU/FP7 EnviroGRIDs project consortium (30 partners) - a large network of research organizations, private companies, and national institutions in Europe lead by the University of Geneva (www.envirogrids.net). This associated partnership enabled CENS to take part in two big networking events: the full project meeting held in Sofia 18-20 April 2012 and the final meeting of EnviroGRIDs project held in Batumi, Georgia, 30 Oct. - 1 Nov. 2012.
- EU/FP7 TURAS project consortium - strong network of European organizations lead by University College Dublin (http://www.turas-cities.org). This enabled CENS to take part in the second annual general meeting of the project held in Rome November 4th-5th.

Last but not least, the plan of Joint Research included two events for networking (i) the EcoArm2ERA joint scientific workshop and (ii) the EcoArm2ERA summer school.

EcoArm2ERA joint scientific workshop

Scientific workshop *"Integration of Spatial Decision Support Systems and Evidence Based Modeling in National/Regional Policy Applications and Regulatory Systems: Scientific and Policy Challenges"* was organised by NUID UCD in Dublin in July 9-12, 2013 (fig. 7). The objective of this workshop was to develop best practice evidence of both analytical tools and policy applications available in Europe, Canada and New Zealand. Scientists, researchers and policy makers from Ireland, Belgium, Switzerland, Armenia, Canada and New Zealand have presented their challenges, problems and solutions on the evidence-based modelling in policy applications.

Fig. 7 *Joint scientific workshop at UCD July 9-12, 2013*

The workshop materials consisted of 28 presentations are available on the organiser's website at http://www.ucd.ie/gpep/events/seminarsworkshopsconferences/ecoarm2eralumanworkshop.

The linkage between presentations and the agenda is ensured to make it easy to find relevant materials.

As intended in the project plan, the workshop was collocated with international congress on Planning for Resilient Cities and Regions organised in University College Dublin in 15th - 19th July 2013 (http://aesop-acspdublin2013.com) (fig. 8). This allowed participant to go beyond the workshop boundaries and get direct contacts with wide international research community. CENS took part to this event too with oral and poster presentations.

Fig. 8 *AESOP/ACSP International Congress 15-19 July 2013*

EcoArm2ERA's Summer school

Summer school entitled *"Bridging ICTs and Environment - Spatial Planning and Environmental Assessment for Decision Making in Europe",* held at the Central European University (CEU) in Budapest, Hungary, 7-11 July 2014. The goal was to establish initial contacts and to foster collaborative ties between young researchers (mainly PhD level, PostDoc, and young researchers) from both Armenia (selected by CENS) and the EU (UCD, UNIGE, and other institutions), while offering a palette of lectures linked to CENS priority research areas (fig 9, 10).

Fig. 9 EcoArm2ERA's Summer school at CEU

Fig. 10 *All participants received certificates of attendance to the Summer school.*

These priorities were defined as Information and Communication technologies (ICT), environmental assessment and spatial planning. To increase the scope and impact of the event and its benefits for the young researchers, it was decided to collocate the summer school with another parallel school at CEU lead by Dr. Lagutov and targeting primarily midcareer environmental professionals as a preparatory activity for the Eye on Earth Summit 2014 (http://eyeonearthsummit.org): "Bridging ICTs and Environment - Making Information Talk and Technologies Work".

These two summer schools were linked under the umbrella thematic "Bridging ICTs and Environment" (http://summer.ceu.hu/talk-2014) and we were able to join the participants of both schools during the first day (Monday, Plenary) of our program. This was extremely beneficial both parallel schools in term of attracting interesting keynote lectures (e.g. from Google, ESRI, UNEP) and for the interactions between students, researchers and professionals in environment. The EcoArm2ERA summer school set of lectures aimed at facilitating integration of researchers from EU neighbours into the European research scene on ICT and spatial planning in environmental management and decision-making. The potential cooperation paths were presented to prospective collaborators from the target countries. A series of recently completed and ongoing research

projects in the area of geospatial-based decision-making were presented and discussed. The summer school provided a forum for getting to know other potential collaborators in the related areas for the exchange of best practice and ideas and for networking activities. The feedbacks from the participants were very positive. However, we had several challenges when preparing this school, notably (1) the heterogeneity of the content, (2) the joint program with the summer school, and (3) the wide background of the participants. This event strengthened even more the collaboration between UNIGE, CENS and UCD. This allowed for a clearer understanding of research carried out in the three institutions, which laid the ground for future joint research projects.

In conclusion, research collaboration and exchange of experience with international colleagues permitted to

- contributing to improve research skills for CENS staff;
- improving skills on how to publish the results in peer-reviewed international scientific journals;
- identifying tools and extra-resources for implementing large-scale researches and raising their efficiency;
- developing the idea of creating joint research virtual laboratories between CENS and UNIGE/NUID UCD.

The results of developing international cooperation and integration and adapting the results of the research to present-day requirements will be reflected in the national and regional programs in which CENS will be involved.

Building competences needed for participation in FP7/Horizon2020

The attainment of this objective was achieved through two measures: (i) the conduct of two training FP7/Horizon2020 workshops and (ii) the set-up and implementation of a coaching scheme for the research administrators and other relevant staff members of CENS.

Two training events had goals to build the FP7 project acquisition and participation capacity among the principle research investigators of CENS.

Fig. 11 *Training workshop on RTD proposal preparation by GIRAF PM*

First event lasted 2 days (23-24 April 2014) was focused mostly on the general project management knowledge and skills (using FP7 as an example) (fig.11). Fundamentally, it addressed the following topics:

- How the European RTD schemes (FP7 and Horizon 2020) are structured. How to practically search for funding opportunities.
- Project acquisition (shaping project idea, partner search techniques, collaborative proposal development, what makes research proposal competitive, etc.)
- Proposal writing skills
- Proposal submission, evaluation, follow up.
- Basics of project management, including IPR regime in European research projects.

While the second training (2 Dec. 2013) built on the first training event was based on the practical experiences stemming from the submissions of several RTD proposals during 2012-2013, coaching activities implemented in 2013, and, on this basis, to facilitate a practical application of the acquired knowledge and skills right at the beginning of Horizon2020, coaching activities implemented in 2013, and, on this basis, to facilitate a practical application of the acquired knowledge and skills right at the beginning of Horizon2020.

The potential impact (including the socio-economic impact and the wider societal implications of the project so far) and the main dissemination activities

Potential impact

Strengthening the national capacities of geospatial data sharing, EcoArm2ERA increased the visibility and national position of CENS as an expert in environmental research, and expended their regional and international networks in this field. In the framework of the EOPOWER project and under strong support of University of Geneva, a set of practices and guidelines – the so-called EGIDA methodology – was applied to contribute to institutional capacity building at CENS to optimally use Earth Observation resources towards sustainable development in Armenia (fig. 12) EcoARM2ERA was an ideal framework in which the gaps found in Armenia's data sharing practices thanks to EGIDA methodology could be voiced, with solutions to address them. This is part of the general objective of the project to integrate Armenia into European and global research.. CENS – was instrumental in allowing the development of a Spatial Data Infrastructure to share many important environmental data and information. Data sets from the Center are now discoverable and accessible through the GEOSS. Due to UNIGE efforts, Armenia became an associative member of EU/FP7 EnviroGRIDs and EOPOWER projects coordinated by them and promoting the GEO/GEOSS framework among the Black Sea basin countries, including the two South Caucasian republics: Armenia and Georgia.

At the national level, CENS plan to establish a single coordination mechanism for data sharing, cooperating in an integrated manner with other agencies, organizations and levels of governance concerned with GEO Societal Benefit Areas.

Fig. 12 *GEO-Flyer aimed to raise the awareness of GEO/GEOSS in Armenia.*

4.2 Dissemination activities

Special attention was given to the dissemination activities within EcoArm2ERA. Dissemination strategy was based on to present the general idea of the project to the target group members, related organizations, stakeholders and public. Design and development of all promotional materials were handed out at the events and through the partners by CENS.

Official project website

The official EcoArm2ERA project website is available since March 2012 at www.ecoarm2era.eu.
The objective of this website is to provide information regarding the project addressed to the public. During the project lifetime, website visitors were informed about the project's concept, progress and results. For more detailed information some results (deliverables) accepted by the EU are available for download.
The main beneficiaries:

- published the news of the project in the web sites of the organizations (CENS, UCD, UNIGE)
- put a link of the project website in their own web-site – www.ecoarm2era.eu
- Published the news of the project in Newspaper "The voice of Armenia" and in CENS magazine.
- Published
    - Research papers in peer-reviewed scientific journals (Listed in section A)(fig. 13)
    - a feature article "A new era for cooperation - ECOARM2ERA project" in the leading global disseminational resource - ***The International Innovations*** by *Research media Ltd(pages122-125).* http://www.research-europe.com/magazine/ENVIRONMENT/ENV19/index.html (fig. 14)
- designed, prepared or published and distributed some dissemination materials like;
    - leaflets (fig. 15)
    - EcoArm2ERA Newsletters N1, 2 (fig. 16)
    - Posters
    - CENS magazine

The project leaflets, newsletters and posters were designed by CENS in 2012/2013. They provide a thorough but simple to understand description of the project's concept. The leaflet are available in English language. The leaflets and newsletters were distributed at project events, such as workshops, and at other events where consortium members participated (see below). The leaflet was revised in 2014 to include some of the project results and to refresh their design.

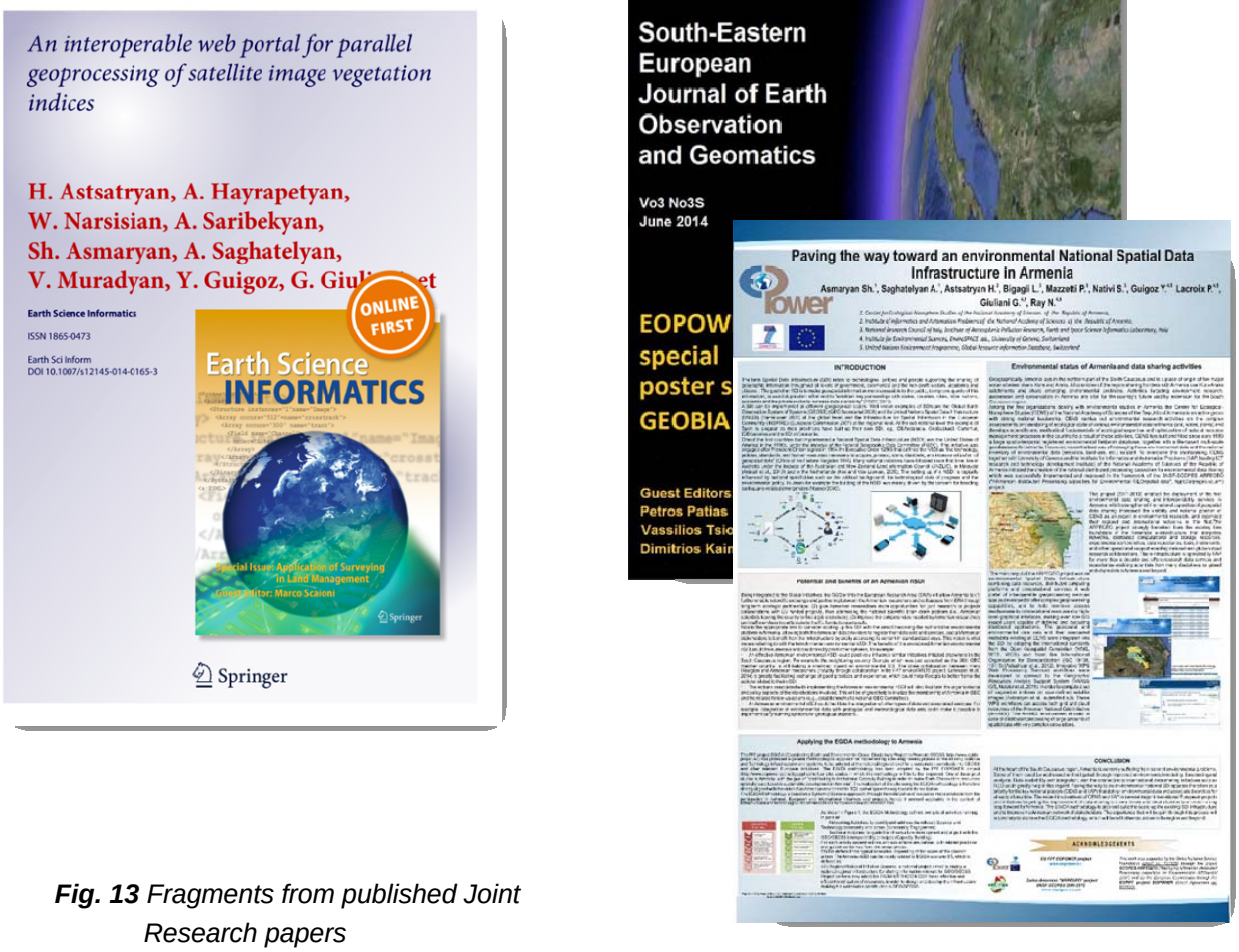

Fig. 13 *Fragments from published Joint Research papers*

A new era for cooperation

Drs Shushanik Asmaryan and **Armen Saghatelyan** describe efforts by Armenia's primary centre for environmental science to equip the country for collaboration within the European research community

The central goal of EcoArm2ERA is to reinforce international cooperation in research between the Armenian leading institute in environmental and ecological studies and the European Research Area (ERA). Can you outline how this will be achieved?

To reach the goal, we set three objectives: to define and promote a sustainable development strategy for the Centre for Ecological-Noosphere Studies of the National Academy of Sciences of the Republic of Armenia (CENS), particularly in terms of improving capacities, visibility and competitiveness overall; to develop strategic partnerships between CENS and the School of Geography, Planning and Environmental Policy of the Earth Sciences Institute at University College Dublin (NUID UCD), and the Institute of Environmental Sciences at the University of Geneva (UNIGE), thus building CENS' capacity to acquire and conduct international collaborative research partnerships, and to build Armenian researcher and support staff competency for participation in the EU Seventh Framework (FP7)/Horizon 2020 programmes.

What are the main areas of research at CENS and can you explain the typical approach to such investigations?

Few organisations deal with environment-related research in Armenia. CENS is an active group with strong leadership that carries out fundamental and applied studies in ecology and environmental protection.

Investigations at CENS are multidisciplinary and directed toward complex assessments of ecological status and development of fundamental science, methods and ecological expertise.

The structure of CENS includes a number of problem-orientated departments. Research teams deal with environmental geochemistry, bioenergy, food quality, biogeochemistry, terrain stability and flood chain risk assessment. Of special interest are Geographical Information Systems (GIS) and Remote Sensing technologies, which provide up-to-date technological solutions when assessing and modelling the ecological state of different environmental sectors – soil, water, plants.

Why is cooperation with the ERA a priority for the Centre?

CENS is the central player in the field of environment research in Armenia and the region; as the government expert body and service provider, CENS coordinates all national research activities in the field. Thus, building capacity for cooperation will have a systemic impact on environmental research across Armenia and also bring Armenian scientific system closer to ERA.

How will EcoArm2ERA increase the scope of CENS and improve the Centre's response to Armenian socioeconomic needs?

It is not surprising that environmental and ecological issues constitute most of the Grand Societal Challenges Europe is facing at the moment. It is therefore of utmost importance not only to tackle these problems, but to bring together research teams from different countries to gain new expert knowledge and capabilities from non EU-members. In Armenia, research for agricultural production as well as environmental and ecological purposes plays a very important role, as the Armenian economy still depends heavily on agriculture and mining – these respectively account for about 30 and 40 per cent of gross domestic product.

Mining incurs a vast chain of environmental problems. CENS has strong expertise in the area of environmental and ecological research and it is strongly application-orientated. So the central assumption of this project is that bringing together Armenian and European scientific communities and increasing research cooperation between the research institutions will bring significant socioeconomic benefits to both Europe and Armenia.

CENS offers multidisciplinary research developments and service that are of special interest for decision making to governmental and international research organisations and authorities. Thus CENS delivers a unique context for the development of environmental observation and spatial decision support systems. EcoArm2ERA provided an opportunity to analyse and clearly identify the status quo of the general research environment and also the strengths and weaknesses of CENS.

Are you taking specific steps to facilitate the inclusion of Armenian research groups into European Research and Technological Development consortia?

Thanks to UNIGE, EcoArm2ERA facilitated the integration of CENS into one of the most impressive European research 'families', as an associate partner in the FP7 enviroGRIDS project. With the strong support of UNIGE, CENS was further involved in a large European consortium that was bidding for one of the last FP7 calls.

CENS also participated in two FP7 COST Action consortia, FP 1204 'Green Infrastructure Approach: linking environmental with social aspects in studying and managing urban forests' and ES 1104 'Arid Lands Restoration and Combat of Desertification. Setting up a Dry lands and Desert Restoration Hub'.

How has EcoArm2ERA raised awareness among CENS research administrators about relevant funding opportunities?

The project helped to give the administrative body an objective and alternative assessment of separate subdivisions in terms of the possibility of their enrolment in new projects. The CENS administrative body normally provides reserved resources to reduce project management risk in cases of need.

What do you hope to achieve through development and implementation of joint research plans?

Apart from the fact that CENS's research groups will be strengthened through networking with other European research centres, the enhanced participation of Armenia in European research programmes and their infrastructures will boost research opportunities for young scientists in the country and help to preclude a brain-drain. Superior job and career development opportunities will help to create a new national 'elite' of young researchers.

What are the most significant benefits to Armenian researchers from becoming part of the ERA?

The major achievements of this integration are and will be: formation of a common research space, creation of new formats for research infrastructures, experience and information exchange, joint working to find solutions to problems the community faces as a whole and establishment of personal contacts and stimulation of links between scientists and their circles – overall, resulting in an improvement in confidence levels.

Further development of the ERA is needed to overcome the fragmentation of research in Europe along national and institutional barriers. What role can EcoArm2ERA play in fulfilling this goal?

Geographically, Armenia lies at the highest position in the South Caucasus and is the place of origin of major water sources for the region: the Kura and Araks rivers. All bordering countries use the Kura-Araks catchments and so share emerging environmental problems. Consequently, information regarding the ecological state of these shared environmental resources is necessary for the development of both short- and long-term plans for economic and social development in the Southern Caucasus region. This is especially so when you consider large projects currently planned for construction of oil and gas pipelines and the construction of a Europe–Caucasus–Asia transport corridor.

In this context, CENS has a successful record of a variety of prestigious projects carried out over the last 10 years for the region, sometimes in partnerships with other countries, such as Azerbaijan and Georgia. One project was funded by a NATO 'Science for Peace' programme grant, others by the UNESCO Man and the Biosphere programme, the Organisation for Security and Cooperation in Europe and the United States Agency for International Development, US Civilian Research and Development Foundation for the Independent States of the Former Soviet Union, etc. So building capacity measures such as training, twinning/design and implementation of joint research – as well as a sustainable strategy for increasing CENS' regional coverage via EcoArm2ERA – will improve our ability to respond to socioeconomic conditions. EcoArm2ERA will lay the foundation for effective future collaboration between research institutions in ERA.

What contribution is EcoArm2ERA making to supporting early-stage researchers?

Youthful research staff are characteristic of CENS in comparison with other academic institutions and Centres. Most – myself included – started their research career in CENS as university students. Today, maintenance and improvement of competitiveness of a unique research and academic school such as CENS is a fundamentally important strategic issue. To meet future challenges, we intend to establish a Joint Research Laboratory to promote active exchanges of knowledge and experience with leading European leading centres such as UNIGE and NUID UCD. This will enable our young scientists to obtain valuable input regarding current research and priorities and to be exposed to best practice at a very early stage in their research careers.

The idea of the Joint Research Laboratory between CENS, UNIGE and NUID UCD was formulated in EcoArm2ERA. We now need to discuss ways of realising this: its mechanisms, funds and the foci of activities. But first, we need to consider, define and analyse all the issues jointly with our partners. We have therefore scheduled a number of meetings and I hope to be able to update you more fully on progress at a later date.

The greening of science in Armenia

The **ECOARM2ERA** project is enhancing the capacity of the ecology and natural resources research centre of the Armenian Academy of Science to provide new opportunities for young scientists

WITH AROUND 3 MILLION inhabitants, the Republic of Armenia is a comparatively small country – approximately the size of Switzerland – situated between Turkey and Azerbaijan in the mountainous Caucasus region of southwest Asia. It also borders Iran, Georgia and the Azerbaijan-Nakvican enclave.

Ecology and human security are key concerns for Armenia. The country struggled economically after the breakup of the USSR in 1991 and the energy crisis of the 1990s, being landlocked, it is almost entirely dependent on oil and energy imports for its energy needs. Despite its pivotal position on the ancient Silk Road, it was not included on the course of the new Iron Silk Route railway responsible for transportation of oil, gas and goods between east and west.

As a consequence of the energy crisis and economic instability in the 1990s, much of Armenia's land was deforested as people foraged for fuel. Now, as mining operations expand, the remaining forests are also projected to substantially dwindle. Land and rivers have meanwhile been polluted from the use of DDT and other toxic chemicals in farming and by heavy metals such as lead, zinc, mercury, copper and cadmium – largely from the mining industry but also as a consequence of air pollution and the discharges of industrial effluent. In addition, parts of Armenia are seismic zones and so vulnerable to earthquakes. Armenia therefore presents a unique context for ecological and environmental study as well as major opportunities for socioeconomic advancement.

SCIENTIFIC RENEWAL

Before the breakup of the USSR, Armenia was widely known for the excellence of its science. With the breakup, however, budgets for research and education were cut, scientific and technical talent left the country because of lack of opportunity and laboratory equipment aged and was not replaced, so Armenia was unable to compete for pan-European and international scientific projects. Over the last 20 years, however, the Armenian Government has adopted an approach of profound reform, modernisation and growth, as a result, Armenia is now a democracy and a free market economy with a large trade base. Importantly, there has been renewed investment in scientific endeavour and Armenia once again enjoys a reputation for scientific excellence and technological innovation.

> EcoArm2ERA's central goal is to initiate and significantly increase scientific cooperation between the European Research Area and CENS – the leading Armenian centre in the sphere of ecological and environmental research

The Centre for Ecological-Noosphere Studies (CENS) is a part of the National Academy of Sciences (NAS) of the Republic of Armenia – the non-profit state institution for scientific education and research. Founded in 1989, CENS is focused on the protection of the environment and the use of natural resources and collaborates extensively both nationally and internationally with universities, associations and other institutions in related fields. Conservation, ecology and food safety are its main foci. About 50 per cent of the research projects undertaken at CENS are funded by the Armenian government; the rest receive funding from grants, commission and partnerships.

In 2011, the EcoArm2ERA project was initiated within the EU's Seventh Framework Programme (FP7) to augment the abilities and capacity of CENS, especially in terms of entering into consortia projects in the European Research and Technological Development (RTD) arena. "EcoArm2ERA's central goal is to initiate and significantly increase scientific cooperation between the European Research Area and CENS – the leading Armenian centre in the sphere of ecological and environmental research", explains Dr Shushanik Asmaryan, the head of the Geographical Information Systems (GIS) and Remote Sensing Department of CENS, and coordinator of EcoArm2ERA. Twinned with equivalent centres for environmental sciences at the Universities of Geneva (UNIGE) and Dublin (NUID UCD), and supported by specialist training and project management organisation named GIRAF PM, EcoArm2ERA has already achieved much of the goal, largely due to the strength of the support contributed by the Swiss and Irish partners and to synergies with another collaborative project that has recently completed, ARPEGEO.

THE ARPEGEO PROJECT

ARPEGEO was a joint endeavour with the University of Geneva, funded by the Swiss National Science Foundation under the umbrella of its Scientific Cooperation Projects with Eastern Europe programme, known as SCOPE. ARPEGEO was designed to create a close partnership between the environmental SPACE laboratory at UNIGE, CENS and another part of the Armenian NAS, the Institute for Informatics and Automation Problems. Asmaryan represented CENS in the ARPEGEO project and attributes much of the success of EcoArm2ERA to the synergies not only between the projects but also in the close relationship between the institutions themselves: "At the final meeting of ARPEGEO, the strength of the research partnership between CENS and UNIGE was evident and we are keen that it continues," Asmaryan states. Among the topics highlighted at the meeting were the issue of Armenia's integration into the European Earth Observation / Global Earth Observation System of Systems initiative and potential associate membership of the Open Geospatial Consortium. "The vision is to fill gaps in the compatibility of skills, information and knowledge of the Armenian environmental research community by applying international standards, transferring knowledge and exchanging experience," Asmaryan explains.

CREATING A NEW ELITE OF YOUNG RESEARCHERS

The population of Armenia is predominantly young: only 20 per cent of the people are older than 55. Asmaryan and CENS are hopeful that the wider prospects afforded through the EcoArm2ERA project will attract young scientists and provide sufficient incentive for them to pursue their future careers in environmental research in Armenia and, ideally, at CENS.

A number of symposia and workshops were staged during EcoArm2ERA collocated by ARPEGEO, covering subjects such as the benefits of sharing environmental data and of the adoption of international standards for such data; a training course was also held on the preparation of RTD proposals for large multidisciplinary European projects.

In September, CENS will host a scientific conference for young researchers from the Newly Independent States – Azerbaijan, Belarus, Estonia, Georgia, Kazakhstan, Kyrgyzstan, Moldova, Tajikistan, Turkmenistan, Ukraine and Uzbekistan, as well as Armenia – to analyse environmental issues and identify groups at risk. The conference will also provide a platform for discussions of the range of problems that can arise when seeking to collaborate with other institutions and countries in the European Research Area and feature presentations based on the results of EcoArm2ERA.

The next step from both ARPEGEO and EcoArm2ERA will be a scientific workshop in July to explore the challenges involved in integration of Spatial Decision Support Systems and evidence-based modelling in national and regional policy applications and regulatory systems. The workshop will be staged to coincide with the international congress on Planning for Resilient Cities and Regions at University College, Dublin, as Asmaryan enthuses: "Collocation will allow participants from CENS to go beyond the workshop boundaries and extend their contacts with the international research community".

INTELLIGENCE

ECOARM2ERA

EU CO OPERATION CAPACITY BUILDING OF CENTER FOR ECOLOGICAL-NOOSPHERE STUDIES OF NATIONAL ACADEMY OF SCIENCES OF ARMENIA: TOWARDS ARMENIA'S INTEGRATION INTO THE ERA

OBJECTIVES

To reinforce the international research cooperation between Armenian leading institute in environmental and ecological studies CENS and ERA in the entirely important areas, specifically Seventh Framework Programme Themes as: Environment, KBBE and Space (eg. GIS technologies for environment)

PARTNERS

CENS NAS RA • GIRAF PM • UNIGE • NUID UCD

FUNDING

EU Seventh Framework Programme (FP7) – contract no. 294924

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DR SHUSHANIK A.SMARYAN received her education in Yerevan State University, Department of Geography. She started her research career in CENS from 1988 as a university student and defended her PhD thesis in Geography in 2008. Since 2009 she has been leading the Department of GIS and Remote Sensing Technologies of CENS.

DR ARMEN S.AGHATELYAN graduated at Yerevan State University, Department of Geology. He received his PhD degree in 1985 and degree of Doctor of geo-mineralogical sciences in 2000 in the Institute of Mineralogy, Geochemistry and Crystallo-chemistry of Rare Elements (IMGRE) of the Russian Federation Ministry of Geology (Moscow). Since 1993 Dr Saghatelyan has been Director of the Center for Ecological-Noosphere Studies of National Academy of Sciences of Republic of Armenia.

Fig. 14 *A feature article "A new era for cooperation - ECOARM2ERA project" in the International Innovations*

Fig. 15 *EcoArm2ERA leaflet*

Fig. 16 *EcoArm2ERA newsletter*

- Presented the project in several meetings, scientific conferences, workshops (oral and poster presentation).
    - 32nd International Geographical Congress held in Cologne, Germany 26-31 August, 2012.

- International Conference “Informatization and spatial modelling of geographical studies, natural and socio-economical systems” held in Alushta, Crimea, Ukraine 15-20 September 2012, addressed to the NIS countries: Armenia, Azerbaijan, Belarus, Russia, Tajikistan, and Ukraine.
- International congress on Planning for Resilient Cities and Regions organised in University College Dublin in 15-19 July 2013, Dublin, Ireland
- 8th IAG International Conference on Geomorphology, 27-31 August 2013, Paris, France.
- Infoday on 2014 Calls - HORIZON 2020, SC5: Climate Action, Environment, Resource Efficiency and Raw Materials held on November 12, 2013, Brussels, Belgium.
- European Geoscience Union General Assembly 27 April – 02 May 2014, Vienna, Austria
- Policy Stakeholders Conference on “EaP STI cooperation in addressing Climate Change” 15-16 May 2014, Yerevan, Armenia
- GEOBIA 2014, 21-24 May, 2014, Thessaloniki, Greece
- GEO XI Plenary 13-14 Nov. 2014, Geneva, Switzerland
- 5th International Conference on cartography and GIS 2014, 15-21 June, 2014, Varna, Bulgaria
- International conference InterCarto-InterGIS20 "Sustainable development of territories: cartography and geoinformational support", 23-24 July, 2014 Belgorod, Russia
- 1st International GlobalSoilMap Conference, Orleans, France, 7-9 October, 2013
- International workshop “Soil Spectroscopy: the present and future of Soil Monitoring” 4 - 6 December 2013, Rome, Italy

All materials were disseminated through project web-site - http://www.ecoarm2era.eu/ and other social networks:

- http://www.linkedin.com/groups?gid=4940898
- https://www.facebook.com/Ecoarm2era

EcoArm2ERA’s DISSEMINATION EVENTS

During Project lifetime several dissemination events were organised presenting temporary results of the project:

- ***International workshop “Environmental data sharing: adopting international standards to benefit the Armenian scientific community”*** held in Yerevan in 2-3 April, 2013 organized by all the CENS, UNIGE and IIAP at the scope of Swiss-Armenian SNSF SCOPES - "ARPEGEO" project.

- ***The final meeting/symposium "Environmental data sharing for the benefits of the South Caucasus region"*** of ARPEGEO project held in Yerevan in 22-23 May, 2013. The event was organized jointly by CENS, UNIGE.

These two events were an evidence of the synergy of EcoArm2ERA and ARPEGEO and which spotlighted start and successful being of the research partnership between CENS and UNIGE and will be continued indeed. CENS hosted the delegates from the different regions of the world (Caucasus, Balkan and Baltic region countries) and global initiatives like Group of Earth Observation, NOAA and OGC (fig. 17, 18). Among the issues considered during the meeting we must highlight the issue of Armenia's integration into GEO/GEOSS initiative and the associate membership to the Open Geospatial Consortium (OGC). The vision is to fill the gaps of compatibility of the skills, information and knowledge of Armenian environmental research community by applying the international standards, transferring knowledge, exchanging the experience with our foreign colleagues.


Fig 17 *International workshop "Environmental data sharing: adopting international standards to benefit the Armenian scientific community"*



Fig. 18 *The final meeting/symposium "Environmental data sharing for the benefits of the South Caucasus region" of ARPEGEO project*

EcoArm2ERA's FINAL MEETING

The final meeting was consisted of two sessions: Plenary session/project symposium "Towards Armenia's integration into the European Research Area: Challenges, opportunities and achievements" and International workshop "Armenian environmental SDI - benefits for sustainable development" held 30 Sept – 1 Oct., 2014 in Yerevan (fig. 19, 20). CENS hosted the delegates from the different regions of the world (Caucasus, Russia Eastern and Western Europe) and global initiatives like OGC. A field tour "Southern ARMENIA: heritage conservation and spatial planning" was planned to introduce to Armenia's heritage for further discussions and developing joint research projects on ecosystem restoration.

The main goals of the meetings are (i) to present the opportunities, challenges and main achievements for environmental research that brought to the overall improvement of CENS in recent years, (ii) to showcase the main environmental capacities, visibilities and competitiveness CENS and (iii) to present what has contributed or will contribute significantly to the sustainable inclusion of CENS into the European research area. The workshop was aimed to reveal what has been developed in Armenia in terms of SDI, data sharing principals, geoprocessing of environmental data and working with stakeholders. Special session was planned for young researchers to promote and improve their skills to publish the research papers and present them to the European research community.


Fig. 19 *Final EcoArm2ERA project Symposium "Towards Armenia's integration into the European*

Research Area: Challenges, opportunities and achievements", 30 Sept, 2014 Yerevan, Armenia

Fig. 20 *International workshop "Armenian environmental SDI - benefits for sustainable development" 1 Oct. 2013*

THE ADDRESS OF THE PROJECT PUBLIC WEBSITE, CONTACT DETAILS

Website

The EcoArm2ERA website can be found at the following link:
http://www.ecoarm2era.eu/

Coordination

The project is co-ordinated by the Center for Ecological-Noosphere Studies NAS RA - CENS

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4.1 Use and dissemination of foreground

Section A (public)

TEMPLATE A1: LIST OF SCIENTIFIC (PEER REVIEWED) PUBLICATIONS, STARTING WITH THE MOST IMPORTANT ONES										
NO.	Title	Main author	Title of the periodical or the series	Number, date or frequency	Publisher	Place of publication	Year of publication	Relevant pages	Permanent identifiers[1] (if available)	Is/Will open access[2] provided to this publication?
1	*An interoperable web portal for parallel geoprocessing of satellite image vegetation indices*	*H. Astsatryan, N. Ray, Sh. Asmaryan et a*	*Earth Science Informatics*	*No 7, June, 2014*	*Springer Verlag*	*Germany*	*2014*	*Electronic*	*10.1007/s12145-014-0165-3*	*No*
2	*Leading the way toward an environmental National Spatial Data Infrastructure in Armenia*	*Sh. Asmaryan, N. Ray et all*	*South-Eastern European Journal of Earth Observation and Geomatic (SEEJoEOG) GEOBIA 2014*	*Vol 3,September, 2014* *22-25 May 2014*	*Aristotle University of Thessaloniki, Greece*	*Greece*	*2014*	*53-62*	*http://archive-ouverte.unige.ch/unige:44955*	*Yes*

[1] A permanent identifier should be a persistent link to the published version full text if open access or abstract if article is pay per view) or to the final manuscript accepted for publication (link to article in repository).

[2] Open Access is defined as free of charge access for anyone via Internet. Please answer "yes" if the open access to the publication is already established and also if the embargo period for open access is not yet over but you intend to establish open access afterwards.

3	*Using Remote Sensing Technologies for the Research of the Transformation of Ecosystems (Case Study: Lake Sevan Basin).*	*Vahagn Muradyan, Shushanik Asmaryan, Tatevik Hovhannisyan*	*Journal of earth science and engineering* *AESOP/ACSP 5 Joint Congress*	*Vol. 3, No 6, June 2013* *15-19 July, 2013*	*David Publishing*	*USA*	*2013*	*363-370*	*http://www.davidpublishing.com/show.html?14117*	*Yes*
4	*Applying GIS for mapping basic integral indices of landscape-ecological analysis*	*V. Muradyan, Sh. Asmaryan*	*5th International Conference on Cartography and GIS*	*15-20 June 2014*	*Bulgarian Cartographic Association*	*Bulgaria*	*2014*	*507-517*	*No*	*No*
5	*The utility of GIS for assessing the ecological state and managing Armenia's farmlands*	*A. Saghatelyan, Sh. Asmaryan, V. Muradyan*	*5th International Conference on Cartography and GIS*	*15-20 June 2014*	*Bulgarian Cartographic Association*	*Bulgaria*	*2014*	*103-109*	*No*	*No*
6	*USING GIS-TECHNOLOGIES IN THE LANDSCAPE AND ENVIRONMENTAL STUDIES IN ARMENIA*	*Sh. Asmaryan*	*International conference InterCarto-InterGIS 20 "Sustainable development of territories: cartography and geoinformational support"*	*23-24 July, 2014*	*International Cartographic Association*	*Russia*	*2014*	*587-592*	*No*	*No*

TEMPLATE A2: LIST OF DISSEMINATION ACTIVITIES								
NO.	Type of activities[3]	Main leader	Title	Date/Period	Place	Type of audience[4]	Size of audience	Countries addressed
1	*Web sites/Applications*	*CENS*	*EcoArm2ERA project web-site: www.ecoarm2era.eu*	*29 February 2012*	*web*	*Scientific community (higher education, Research), Industry, Civil society, Policy makers, Medias*	-	*International*
2	*Web sites/Applications*	*UNIGE*	*EU-FP7 EOPOWER project web-site http://www.eopower.eu/?q=node/56*	*01 January, 2014*	*web*	*Scientific community (higher education, Research), Industry, Civil society, Policy makers, Medias*	-	*International*
3	*Web sites/Applications*	*UCD*	*EU-FP7 TURAS project web-site http://www.turas-cities.eu/pa/partners/37*	*01.December 2013*	*web*	*Scientific community (higher education, Research),*	-	*International*

[3] A drop down list allows choosing the dissemination activity: publications, conferences, workshops, web, press releases, flyers, articles published in the popular press, videos, media briefings, presentations, exhibitions, thesis, interviews, films, TV clips, posters, Other.

[4] A drop down list allows choosing the type of public: Scientific Community (higher education, Research), Industry, Civil Society, Policy makers, Medias, Other ('multiple choices' is possible).

						Industry, Civil society, Policy makers, Medias		
4	*Oral presentation to a scientific even*	*CENS*	*Environmental data sharing: adopting international standards to benefit the Armenian scientific com*	*02 April 2012*	*Yerevan, Armenia*	*Scientific community (higher education, Research), Policy makers, Medias*	*30*	*Armenia, Georgia, Switzerland, Romania*
5	*Posters*	*CENS*	*32nd International Geographical Congress*	*29 August 2012*	*Cologne, Germany*	*Scientific community (higher education, Research), Policy makers, Medias*	*3000*	*International*
6	*Oral presentation to a scientific event*	*CENS*	*Informatization and spatial modelling of geographical studies, natural and socio-economical systems*	*17 September 2012*	*Alushta, Crimea, Ukraine*	*Scientific community (higher education, Research)*	*90*	*Armenia, Azerbaijan, Belarus, Russia, Tajikstan, Ukraine*
7	*Oral presentation to a scientific event*	*CENS*	*ARPEGEO project Symposium "Environmental Data Sharing for the Benefit of the South Caucasus Region"*	*21 May 2013*	*Yerevan, Armenia*	*Scientific community (higher education, Research), Policy makers,*	*80*	*US, Romania, Georgia, Germany, Switzerland, Estonia, Serbia, Armenia*
8.	*Flyers*	*CENS*	*EcoArm2ERA - Integrating Armenia into European Research Area*	*21 May 2013*	*Yerevan, Armenia*	*Scientific community (higher education, Research) - Policy makers*	*80*	*International*
9	*Organisation of Workshops*	*CENS*	*Armenian environmental SDI - benefits for sustainable development*	*01 October,2013*	*Yerevan, Armenia*	*Scientific community (higher education,*	*40*	*Germany, Belgium, Armenia, Ireland,*

						Research) - Policy makers		*Switzerland, Georgia, Russia*
10	*Organisation of Workshops*	*GIRAF PM Services GmbH*	*Training Workshop on Research to Development (RTD) proposal Preparation*	*24 April 2013*	*Yerevan, Armenia*	*Scientific community (higher education, Research)*	*15*	*Armenia, Ireland*
11	*Organisation of Workshops*	*UCD*	*Integration of Spatial Decision Support Systems and Evidence Based Modelling in National/Regional Policy Applications and Regulatory Systems: Scientific and Policy Challenges*	*9-13 July, 2013*	*Dublin, Ireland*	*Scientific community (higher education, Research), Policy makers,*	*32*	*Armenia, Ireland, Switzerland, New Zeland, Belgium, Germany*
12	*Organisation of Workshops*	*GIRAF PM Services GmbH*	*Second Training Workshop on Research to Development (RTD) proposal Preparation*	*02 December, 2013*	*Yerevan, Armenia*	*Scientific community (higher education, Research)*	*20*	*Armenia, Ireland, Switzerland,*
13	*Organisation of Workshops*	*UNIGE*	*Bridging ICTs and Environment - Spatial Planning and Environmental Assessment for Decision Making in Europe*	*07-11 July, 2014*	*Budapest, Hungary*	*Scientific community (higher education, Research), Policy makers,*	*28*	*Armenia, Georgia, Ukraine, Belarus, Germany, Italy, Ireland, Switzerland, Argentina, Serbia, Spain*
14	*Articles published in the popular press*	*CENS*	*A new era for cooperation*	*01 August 2013*	*International Innovation, Researchmedia LTD*	*Scientific community (higher education, Research) - Civil society - Policy makers - Medias*	*-*	*International*
15	*Press releases*	*CENS*	*GEO XI takes the Pulse of the Planet*	*15 November 2014*	*http://earthzine.org/2014/11/07/geo-xi-takes-the-pulse-of-the-planet/*	*Scientific community (higher education, Research) - Policy makers*	*-*	*International*

						- Medias		
16	*Posters*	*UNIGE*	*EOPOWER project workshop at GEOBIA 2014*	*22 May 2014*	*Tessaloniki, Greece*	*Scientific community (higher education, Research) - Policy makers*	*2000*	*International*
17	*Posters*	*CENS*	*European Geoscience Union General Assembly 2014, "Assessing the Ecological State and Managing Armenia's Farmlands"*	*29 April 2014*	*Vienna, Austria*	*Scientific community (higher education, Research) - Medias*	*10000*	*International*
18	*Flyers*	*CENS*	*EcoArm2ERA Integration Armenia European research area*	*01.July 2013*	*Yerevan, Armenia*	*Scientific community (higher education, Research)*	*100*	*International*
19	*Flyers*	*CENS*	*Armenia: towards GEO/GEOSS/ Adopting international standards and sharing spatial data*	*20 September 2014*	*Yerevan, Armenia*	*Scientific community (higher education, Research) - Policy makers*	*100*	*International*
20	*Flyers*	*CENS*	*CENS magazine*	*15 September 2014*	*Yerevan, Armenia*	*Scientific community (higher education, Research) - Civil society - Policy makers*	*300*	*International*
21	*Flyers*	*CENS*	*N1 Newsletter of EcoArm2ERA project*	*01.July 2013*	*Yerevan, Armenia*	*Scientific community (higher education, Research)*	*250*	*International*
22	*Flyers*	*CENS*	*N2 Newsletter of EcoArm2ERA project*	*15 September 2014*	*Yerevan, Armenia*	*Scientific community (higher education, Research)*	*250*	*International*

23	*Oral presentation to a scientific event*	*CENS*	*FP7 ECOARM2ERA Project: Capacity Building and Integration to ERA for the Center for Ecological-Noosphere Studies*	*15 May 2014*	*Yerevan, Armenia*	*Scientific community (higher education, Research) - Policy makers - Medias*	*150*	*Belarus, Russia, Moldova, Ukraine, Hungary, Italy, Estonia, Greece, Germany, France, Georgia*
24	*Oral presentation to a scientific event*	*CENS*	*5th International Conference on Cartography and GIS* *Oral presentation "The utility of GIS for assessing the ecological state and managing Armenia's farmlands"*	*18 June 2014*	*Riviera, Bulgaria*	*Scientific community (higher education, Research) - Policy makers - Medias*	*500*	*International*
25	*Oral presentation to a scientific event*	*CENS*	*5th International Conference on Cartography and GIS* *Oral presentation "Applying GIS for mapping basic integral indices of landscape-ecological analysis."*	*20 June 2014*	*Riviera, Bulgaria*	*Scientific community (higher education, Research) - Policy makers - Medias*	*500*	*International*
26	*Oral presentation to a scientific event*	*CENS*	*INTERCARTO/INTERGIS 20* *Oral presentation "USING GIS-TECHNOLOGIES IN THE LANDSCAPE AND ENVIRONMENTAL STUDIES IN ARMENIA"*	*23 July 2014*	*Belgorod, Russia*	*Scientific community (higher education, Research)*	*200*	*Armenia, Russia, Netherland, Kazakhstan, Belarus, Ukraine*
27	*Oral presentation to a scientific event*	*CENS*	*International workshop "Soil Spectroscopy: the present and future of Soil Monitoring"* *Oral Presentation "Development of remote sensing methods for assessing and mapping soil pollution with heavy metals"*	*05 December 2013*	*Rome, Italy*	*Scientific community (higher education, Research) - Policy makers - Medias*	*200*	*European Countries*
28	*Flyers*		*Infoday on 2014 Calls - HORIZON 2020, SC5: Climate Action, Environment, Resource Efficiency and Raw Materials* *FP7 ECOARM2ERA Project: Capacity*	*12 July 2013*	*Brussels, Belgium*	*Scientific community (higher education, Research) -*	*150*	*International*

			Building and Integration to ERA for the Center for Ecological-Noosphere Studies			*Industry - Policy makers - Medias*		
29	*Posters*	*CENS*	*8th International geomorphological conference Poster presentation "The ecological-geomorphological assessment of urban areas using GIS (a case study Yerevan)"*	*28 August, 2013*	*Paris, France*	*Scientific community (higher education, Research)*		*International*
30	*Posters*	*CENS*	*AESOP/ACSP 5 Joint Congress Poster presentation "Building Spatial data infrastructure for the effective distribution and management of environmental data in Armenia"*	*18 July 2013*	*Dublin, Ireland*	*Scientific community (higher education, Research) - Policy makers - Medias*		*International*
31	*Posters*	*CENS*	*AESOP/ACSP 5 Joint Congress Poster presentation "Using Remote Sensing technologies for the research of the transformation of ecosystems (case study Lake Sevan basin)"*	*19 July 2013*	*Dublin, Ireland*	*Scientific community (higher education, Research) - Policy makers - Medias*		*International*

Section B (Confidential[5] or public: confidential information to be marked clearly)
Part B1

EcoArm2ERA did not produce any patents, trademarks or registered designs.

TEMPLATE B1: LIST OF APPLICATIONS FOR PATENTS, TRADEMARKS, REGISTERED DESIGNS, ETC.					
Type of IP Rights[6]:	Confidential Click on YES/NO	Foreseen embargo date dd/mm/yyyy	Application reference(s) (e.g. EP123456)	Subject or title of application	Applicant (s) (as on the application)

[5] Note to be confused with the "EU CONFIDENTIAL" classification for some security research projects.

[6] A drop down list allows choosing the type of IP rights: Patents, Trademarks, Registered designs, Utility models, Others.

Part B2

No exploitable foregrounds.

Type of Exploitable Foreground[7]	Description of exploitable foreground	Confidential Click on YES/NO	Foreseen embargo date dd/mm/yyyy	Exploitable product(s) or measure(s)	Sector(s) of application[8]	Timetable, commercial or any other use	Patents or other IPR exploitation (licences)	Owner & Other Beneficiary(s) involved

In addition to the table, please provide a text to explain the exploitable foreground, in particular:

- Its purpose
- How the foreground might be exploited, when and by whom
- IPR exploitable measures taken or intended
- Further research necessary, if any
- Potential/expected impact (quantify where possible)

[19] A drop down list allows choosing the type of foreground: General advancement of knowledge, Commercial exploitation of R&D results, Exploitation of R&D results via standards, exploitation of results through EU policies, exploitation of results through (social) innovation.

[8] A drop down list allows choosing the type sector (NACE nomenclature) : http://ec.europa.eu/competition/mergers/cases/index/nace_all.html

4.2 Report on societal implications

A General Information *(completed automatically when **Grant Agreement number** is entered.*

Grant Agreement Number:	294924
Title of Project:	EcoArm2ERA
Name and Title of Coordinator:	Dr. Shushanik Asmaryan

B Ethics

No

1. Did your project undergo an Ethics Review (and/or Screening)? • If Yes: have you described the progress of compliance with the relevant Ethics Review/Screening Requirements in the frame of the periodic/final project reports? Special Reminder: the progress of compliance with the Ethics Review/Screening Requirements should be described in the Period/Final Project Reports under the Section 3.2.2 *'Work Progress and Achievements'*	***NO***
2. Please indicate whether your project involved any of the following issues (tick box) :	***YES***
Ρεσεαρχη ον Ηυμανσ	
• Did the project involve children?	No
• Did the project involve patients?	No
• Did the project involve persons not able to give consent?	No
• Did the project involve adult healthy volunteers?	No
• Did the project involve Human genetic material?	No
• Did the project involve Human biological samples?	No
• Did the project involve Human data collection?	No
Ρεσεαρχη ον Ηυμαν εμβρψο/φοετυσ	
• Did the project involve Human Embryos?	No
• Did the project involve Human Foetal Tissue / Cells?	No
• Did the project involve Human Embryonic Stem Cells (hESCs)?	No
• Did the project on human Embryonic Stem Cells involve cells in culture?	No
• Did the project on human Embryonic Stem Cells involve the derivation of cells from Embryos?	No
Πριωαχψ	
• Did the project involve processing of genetic information or personal data (eg. health, sexual lifestyle, ethnicity, political opinion, religious or philosophical conviction)?	No
• Did the project involve tracking the location or observation of people?	No
Ρεσεαρχη ον Ανιμαλσ	
• Did the project involve research on animals?	No
• Were those animals transgenic small laboratory animals?	No
• Were those animals transgenic farm animals?	
• Were those animals cloned farm animals?	No
• Were those animals non-human primates?	No
Ρεσεαρχη Ινωολωινγ Δεωελοπινγ Χουντριεσ	
• Did the project involve the use of local resources (genetic, animal, plant etc)?	No
• Was the project of benefit to local community (capacity building, access to healthcare, education etc)?	No
Δυαλ Υσε	
• Research having direct military use	No

• Research having the potential for terrorist abuse	No

C Ωορκφορχε Στατιστιχσ

3. Workforce statistics for the project: Please indicate in the table below the number of people who worked on the project (on a headcount basis).

Type of Position	Number of Women	Number of Men
Scientific Coordinator	1	-
Work package leaders	1	3
Experienced researchers (i.e. PhD holders)	9	9
PhD Students	4	4
Other	5	-

4. How many additional researchers (in companies and universities) were recruited specifically for this project?	**no**
Of which, indicate the number of men:	-

D Gender Aspects

5.	**Did you carry out specific Gender Equality Actions under the project**?	○ X	Yes No

6. Which of the following actions did you carry out and how effective were they?

		Not at all effective				Very effective
❑	Design and implement an equal opportunity policy	○	○	○	○	○
X	Set targets to achieve a gender balance in the workforce	○	○	○	○	X
❑	Organise conferences and workshops on gender	○	○	○	○	○
❑	Actions to improve work-life balance	○	○	○	○	○
○	Other:					

7. Was there a gender dimension associated with the research content – i.e. wherever people were the focus of the research as, for example, consumers, users, patients or in trials, was the issue of gender considered and addressed?

○ Yes- please specify

X No

E Synergies with Science Education

8. Did your project involve working with students and/or school pupils (e.g. open days, participation in science festivals and events, prizes/competitions or joint projects)?

X Yes- please specify: PhD, MSc students

○ No

9. Did the project generate any science education material (e.g. kits, websites, explanatory booklets, DVDs)?

X Yes- please specify: Booklets, flyers, website

○ No

F Interdisciplinarity

10. Which disciplines (see list below) are involved in your project?

○ Main discipline[9]: ***NATURAL SCIENCES***

○ Associated discipline[9]: ***Earth and related environmental sciences (geology, geophysics, mineralogy, physical geography and other geosciences, meteorology and other atmospheric sciences including climatic research, oceanography, vulcanology, palaeoecology, other allied sciences)***

○ Associated discipline[9]:

G Engaging with Civil society and policy makers

11a	**Did your project engage with societal actors beyond the research community?** *(if 'No', go to Question 14)*	○ X	Yes No

11b If yes, did you engage with citizens (citizens' panels / juries) or organised civil society (NGOs, patients' groups etc.)?

[9] Insert number from list below (Frascati Manual).

○ No ○ Yes- in determining what research should be performed ○ Yes - in implementing the research ○ Yes, in communicating /disseminating / using the results of the project	
11c In doing so, did your project involve actors whose role is mainly to organise the dialogue with citizens and organised civil society (e.g. professional mediator; communication company, science museums)?	○ Yes ○ No
12. Did you engage with government / public bodies or policy makers (including international organisations)	
X No ○ Yes- in framing the research agenda ○ Yes - in implementing the research agenda ○ Yes, in communicating /disseminating / using the results of the project	
13a Will the project generate outputs (expertise or scientific advice) which could be used by policy makers? ○ Yes – as a **primary** objective (please indicate areas below- multiple answers possible) ○ Yes – as a **secondary** objective (please indicate areas below - multiple answer possible) X No	

13b If Yes, in which fields?

Agriculture		Energy		Human rights	
Audiovisual and Media		Enlargement		Information Society	
Budget		Enterprise		Institutional affairs	
Competition		Environment		Internal Market	
Consumers		External Relations		Justice, freedom and security	
Culture		External Trade		Public Health	
Customs		Fisheries and Maritime Affairs		Regional Policy	
Development Economic and Monetary Affairs		Food Safety		Research and Innovation	
Education, Training, Youth		Foreign and Security Policy		Space	
Employment and Social Affairs		Fraud		Taxation	
		Humanitarian aid		Transport	

13c If Yes, at which level?

- ○ Local / regional levels
- ○ National level
- ○ European level
- ○ International level

H Use and dissemination

14. How many Articles were published/accepted for publication in peer-reviewed journals?	
To how many of these is open access[10] provided?	**3**
How many of these are published in open access journals?	**2**
How many of these are published in open repositories?	
To how many of these is open access not provided?	
Please check all applicable reasons for not providing open access:	
❑ publisher's licensing agreement would not permit publishing in a repository ❑ no suitable repository available ❑ no suitable open access journal available ❑ no funds available to publish in an open access journal ❑ lack of time and resources ❑ lack of information on open access ❑ other[11]: ……	

15. How many new patent applications ('priority filings') have been made? *("Technologically unique": multiple applications for the same invention in different jurisdictions should be counted as just one application of grant).*		**0**
16. Indicate how many of the following Intellectual Property Rights were applied for (give number in each box).	Trademark	**0**
	Registered design	**0**
	Other	**0**
17. How many spin-off companies were created / are planned as a direct result of the project?		
Indicate the approximate number of additional jobs in these companies:		

18. Please indicate whether your project has a potential impact on employment, in comparison with the situation before your project:

❑	Increase in employment, or	❑	In small & medium-sized enterprises
❑	Safeguard employment, or	❑	In large companies
❑	Decrease in employment,	❑	None of the above / not relevant to the project
X	Difficult to estimate / not possible to quantify		

19. For your project partnership please estimate the employment effect resulting directly from your participation in Full Time Equivalent (*FTE = one person working fulltime for a year*) jobs:	*Indicate figure:*

[10] Open Access is defined as free of charge access for anyone via Internet.

[11] For instance: classification for security project.

Difficult to estimate / not possible to quantify	X

I Media and Communication to the general public

20. As part of the project, were any of the beneficiaries professionals in communication or media relations?

○ Yes X No

21. As part of the project, have any beneficiaries received professional media / communication training / advice to improve communication with the general public?

○ Yes X No

22 Which of the following have been used to communicate information about your project to the general public, or have resulted from your project?

X	Press Release	❑	Coverage in specialist press
❑	Media briefing	❑	Coverage in general (non-specialist) press
❑	TV coverage / report	❑	Coverage in national press
❑	Radio coverage / report	X	Coverage in international press
X	Brochures /posters / flyers	X	Website for the general public / internet
❑	DVD /Film /Multimedia	X	Event targeting general public (festival, conference, exhibition, science café)

23 In which languages are the information products for the general public produced?

X	Language of the coordinator	X	English
X	Other language(s) Russian		

***Question F-10*:** Classification of Scientific Disciplines according to the Frascati Manual 2002 (Proposed Standard Practice for Surveys on Research and Experimental Development, OECD 2002):

FIELDS OF SCIENCE AND TECHNOLOGY

1. NATURAL SCIENCES

1.1 Mathematics and computer sciences [mathematics and other allied fields: computer sciences and other allied subjects (software development only; hardware development should be classified in the engineering fields)]

1.2 Physical sciences (astronomy and space sciences, physics and other allied subjects)

1.3 Chemical sciences (chemistry, other allied subjects)

1.4 Earth and related environmental sciences (geology, geophysics, mineralogy, physical geography and other geosciences, meteorology and other atmospheric sciences including climatic research, oceanography, vulcanology, palaeoecology, other allied sciences)

1.5 Biological sciences (biology, botany, bacteriology, microbiology, zoology, entomology, genetics, biochemistry, biophysics, other allied sciences, excluding clinical and veterinary sciences)

2 ENGINEERING AND TECHNOLOGY

2.1 Civil engineering (architecture engineering, building science and engineering, construction engineering, municipal and structural engineering and other allied subjects)

2.2 Electrical engineering, electronics [electrical engineering, electronics, communication engineering and systems, computer engineering (hardware only) and other allied subjects]

2.3. Other engineering sciences (such as chemical, aeronautical and space, mechanical, metallurgical and materials engineering, and their specialised subdivisions; forest products; applied sciences such as

geodesy, industrial chemistry, etc.; the science and technology of food production; specialised technologies of interdisciplinary fields, e.g. systems analysis, metallurgy, mining, textile technology and other applied subjects)

3. MEDICAL SCIENCES

3.1 Basic medicine (anatomy, cytology, physiology, genetics, pharmacy, pharmacology, toxicology, immunology and immunohaematology, clinical chemistry, clinical microbiology, pathology)

3.2 Clinical medicine (anaesthesiology, paediatrics, obstetrics and gynaecology, internal medicine, surgery, dentistry, neurology, psychiatry, radiology, therapeutics, otorhinolaryngology, ophthalmology)

3.3 Health sciences (public health services, social medicine, hygiene, nursing, epidemiology)

4. AGRICULTURAL SCIENCES

4.1 Agriculture, forestry, fisheries and allied sciences (agronomy, animal husbandry, fisheries, forestry, horticulture, other allied subjects)

4.2 Veterinary medicine

5. SOCIAL SCIENCES

5.1 Psychology

5.2 Economics

5.3 Educational sciences (education and training and other allied subjects)

5.4 Other social sciences [anthropology (social and cultural) and ethnology, demography, geography (human, economic and social), town and country planning, management, law, linguistics, political sciences, sociology, organisation and methods, miscellaneous social sciences and interdisciplinary , methodological and historical S1T activities relating to subjects in this group. Physical anthropology, physical geography and psychophysiology should normally be classified with the natural sciences].

6. HUMANITIES

6.1 History (history, prehistory and history, together with auxiliary historical disciplines such as archaeology, numismatics, palaeography, genealogy, etc.)

6.2 Languages and literature (ancient and modern)

6.3 Other humanities [philosophy (including the history of science and technology) arts, history of art, art criticism, painting, sculpture, musicology, dramatic art excluding artistic "research" of any kind, religion, theology, other fields and subjects pertaining to the humanities, methodological, historical and other S1T activities relating to the subjects in this group]

2. FINAL REPORT ON THE DISTRIBUTION OF THE EUROPEAN UNION FINANCIAL CONTRIBUTION

This part of the report will be added as soon as the information is available.