BILAT-UKR*AINA

POLICY BRIEF

Research Infrastructures

Updated Roadmap on joint activities towards trans-national access to scientific infrastructure and upgrading existing/establishing new medium and large scale S&T infrastructures

INTRODUCTION

The roadmap has been elaborated in the frame of the EU FP7 project BILAT-UKR as the outcome of the Inventory of relevant existing and upcoming international accessible medium and large scale S&T infrastructures in Ukraine, the regional workshop "Ukrainian S&T infrastructure: development and perspectives for UA-EU cooperation" hold in Kyiv in 2011 and interviews with stakeholders from scientific community. Its main purpose was to present an analytical report to the relevant stakeholders in the Member States, the European Commission and Ukraine as the scenarios for developing Ukrainian S&T infrastructure to make it an active and accessible part of EU S&T infrastructure.

The conclusions and recommendations intended to be reported to appropriate ministers and government bodies in Ukraine as well as to European Commission Services for their further planning of concrete steps both at the national level and certain actions in the frame of Joint Committee for S&T Cooperation to foster UA- EU S&T cooperation.

The present updated version can be regarded as additional analytical material for consideration in the preparation of the 2nd JSTCC meeting.

EUROPEAN RESEARCH INFRASTRUCTURES. ESFRI

One of the main mechanisms of implementation of the new ten-year strategy is the creation of the common research space by 2020, providing for the establishment of an effective system of generation and dissemination of new knowledge including mobile scientific human resources, research infrastructures as well as increasing the effectiveness of research organizations activity.

New mechanisms for support of fundamental researches

Consolidation of resources and coordination of research policies of EU Member States (MS) is considered as the main way to preserve scientific and technological competitiveness of the EU on the world stage. This is reflected, inter alia, in the creation of new pan-European agencies and programs. Over recent years a number of institutional arrangements, contributing to the further development of European fundamental science, in particular in the areas of grant support for researches (European Research Council, ERC) and development of pan-European research infrastructures (European Strategy Forum on Research Infrastructure, ESFRI) has been elaborated and tested.

At the pan-European level, creation of a strategy for future development of research infrastructures (RIs) has begun in 2002 with the creation of a new European non-formal education - the "European Strategy Forum on Research Infrastructure" (ESFRI), which contributed towards the creation of a coordinated approach to research infrastructures. The main objective of the forum was declared to be the identification of new infrastructures of European importance, covering all scientific fields and the corresponding to the long-term needs of European science.

In 2006, ESFRI produced the first European Roadmap for Research Infrastructures, which included 35 projects, in 2008 it already consisted of 44 projects. The last update of ESFRI list was done in 2010 when the list was completed with projects in the field of environmental protection, biology, energy.

Details of "ESFRI" road maps and their implementation is available at

http://ec.europa.eu/research/infrastructures/index_en.cfm?pg=esfri-roadmap

By the end of 2010 out of 32 countries and associate members of the EU only 5 countries (Cyprus, Latvia, Portugal, Slovakia and Liechtenstein) did not have elaborated any national ESFRI roadmap.

Activities to support research infrastructures are dispersed through all FP7 thematic priorities.

Infrastructures for scientific research - including databanks for genomics and databanks in social science, observatories for environmental sciences, imaging systems or laboratories for study and development of new materials and nano-electronics, and e-infrastructure - are the core element of the research. They are expensive; require a wide range of examination in order to be developed and to be used in industry on European scale.

CURRENT STATE OF ART IN UKRAINE

On the basis of the collected materials (preliminary inventory of Ukrainian RIs (Deliverable 3.2 of BILAT-UKR project[1]) including 30 responses to questionnaires disseminated among 50 stakeholders from scientific community, additional ones during RI workshop (Deliverable 3.5 of the same project) and also presentations done by speakers, the actual state of affairs of Ukrainian RIs with emphasis on their accessibility at national and transnational level as well as vision on their further development can be briefly described.

Regarding the possible areas of RIs cooperation, conclusion was made that **the most developed Ukrainian RIs of EU-dimension belong to the fields of Environment Sciences, including Space and Astronomy, Material Sciences and Biomedical and Life Sciences.** At the same time there is lack of contribution to as well as access of international customers and users to Ukrainian infrastructures in the field of Energy, Social Sciences and Humanities, Computation and Data Treatment.

The significant matter is **lack of information in the EU about state of the art of Ukrainian RIs and existing unique facilities**. At the same time, the European projects entailing RI development especially in ICT (World Data Center, CERN, GRID-related networks) which also include Ukrainian participants reveal their great capability and promising input.

Observatory of Research Infrastructures' Network

Up-to-date, there are only 13 research entities in Ukraine included to the Observatory of Research Infrastructures' Network, namely[2]

- A.O. Kovalevskiy Institute of Biology of Southern Seas, National Academy of Sciences of Ukraine
- Danube Hydrometeorological Observatory of State Hydrometeorological Service of Ministry of Ukraine of Emergencies and Affairs of Population Protection from Consequences of Chernobyl Catastrophe
- G.V.Kurdyumov Institute for Metal Physics, National Academy of Sciences of Ukraine
- Institute of Geological Sciences, National Academy of Sciences of Ukraine
- State Museum of Natural History, National Academy of Sciences of Ukraine
- Ukrainian Lingua-Information Fund, National Academy of Sciences of Ukraine
- Odessa National I.I. Mechnikov University
- Southern Scientific Research Institute of Marine Fisheries and Oceanography
- Taurida National V.I. Vernadsky University
- Marine Hydrophysical Institute, National Academy of Sciences

[1] http://archive.bilat-ukr.eu/_media/Analysis_SnT_Infrastructure_Ukraine.pdf
[2] Source: http://observatory.euroris-net.eu/euroris/countries/view/Ukraine

of Ukraine

- Ukrainian Scientific and Research Institute of Ecological Problems
- Ukrainian Scientific Centre of Ecology of the Sea
- Ukrainian Scientific Research Hydrometeorological Institute, National Academy of Sciences of Ukraine - marine branch

Current Ukrainian Participation in FP7

The researchers from mentioned units participate in 6 FP7 projects distributed in the next areas:

Integrating Activities

- Up-Grade Black Sea scientific network (UP-GRADE BS-SCENE)
- Pan-European infrastructure for ocean and marine data management (SEADATANET II)

Design Studies

- Conceptual modeling of networking of centres for high-quality research in Slavic Lexicography and their digital resources (MONDILEX)

E-infrastructures

- Desktop Grids for International Scientific Collaboration (DEGISCO)
- A Pan-European species-directories infrastructure (PESI)

At the moment, no appropriate coordination between Ukrainian and EU RIs exists practically in any of the considered fields. At the same time, Ukrainian capacities in RIs have potential to be represented in Europe in wider areas and scales then now.

All mentioned above allows us to present possible ways of Ukrainian RI development and possible steps which can bring Ukrainian RIs closer to European ones or which create opportunities for mutual opening-up and accessibility of existing RIs.

POSSIBLE WAYS OF UKRAINIAN RESEARCH INFRASTRUCTURE DEVELOPMENT

If nothing would change and no Ukrainian strategy for RIs would be elaborated outlining a new vision at national level, the RIs mentioned in the inventory will be maintained only through Ukrainian budget programmes (as usual - insufficient ones) with minor input from EU via random projects or through networks in the fields where the most developed Ukrainian RIs have sustainable links with EU RIs.

Additionally, the majority of targeted actions of Specific FP7 Programme ‘Capacities’ including Infrastructures as well as ESFRI projects foresee participation of mainly MS/AS in the projects supported by the EC. In order to achieve progress in Ukrainian RI involvement in ERA, the already existing unique facilities and well-

developed Ukrainian RIs need to increase their visibility.

The opportunities of joining the RIs of EU-dimension will decrease also if no progress will be achieved at political level in signing the Association Agreement. In this case, only EU's ENP would be available for Ukraine and there are certain doubts that JSTCC could significantly contribute to the enhanced interaction between European and Ukrainian RI entities.

The **positive way** of Ukrainian RIs development should be based on the format following national roadmaps elaborated for the majority of MS/AS, defining priorities and adopting appropriate measures from the side of Ukrainian policy makers.

This means first of all appropriate law compliance in the article of funding level for the science and scientific activity which should be not less than 1.7% of GDP (including of course the national infrastructure maintenance), as support of unique infrastructures is rather expensive and requires stable funding.

One of the main issues to decide inside Ukraine is which RIs need the national support for their development and maintenance. To this end, the unique selection criteria need to be defined and approved.

As a result of non-active participation of Ukrainian teams in RIs FP7 Calls, Ukraine takes part in only 6 such projects, financed through FP7. One of reasons of such result could be the absence of special coordinated EU-UA calls. For the comparison, in Russia, where such calls were held in the framework of FP7, there are about 60 joint research projects in various stages of implementation, primarily in the areas of health, biotechnology, nuclear energy, nanotechnology, ICT, aviation and space management, environmental and energy efficiency, as well as 25 RIs created during FP7.

This positive experience should be taken as an example.

RECOMMENDATIONS

The following recommendations should be considered that envisage joint Ukrainian and EU measures. They would include a large variety of steps and activities from both sides and serve as real help to achieve better results.

1. An active **promotion of the research capacities of Ukraine**, particularly of the unique elements of research infrastructures in Ukraine is an appropriate tool to increase mutual state of knowledge. Improving the visibility of Ukrainian research organisations and universities can be achieved through the presentation of selected organizations which are attractive to European researchers. Host organisations in EU Member States could, in return, be also interested to disseminate information about their available research infrastructures. The promotion could take up different format (information brochures/catalogues, web-sites / internet portals, international events such as fairs, exhibitions, congresses, via the S&T

Gate on Ukraine – EU cooperation set up in the frame of BILAT-UKR and BILAT-UKR*AINA: http://www.st-gateukr.eu).

2. **Establish joint expert group** on RI development that would act under and in the framework of EU-Ukraine JSTCC. The main task of this expert group would be ranking of the existing Ukrainian and EU RIs from the viewpoint of their significance for mutual trans-national accessibility and use for mutual benefits. In addition, the group would also collect information on the planned costs of cooperation together with overseeing special agreements for using in-kind contributions for maintaining international large RIs.
3. To pay more attention to the **development of the regional RIs** as a way towards capacity building.
4. To highlight the links of Ukrainian RIs with ESFRI and encourage the mutual accessibility of RIs. **Ukrainian stakeholders need to be considered as potential partners** even if they are not included in any of the on-going ESFRI projects at the moment. The provisions to participate in some of the ESFRI discussions need to be examined with the potential view of joining dedicated European RIs.
5. Multiplying information on web-sites of NAS of Ukraine, Vernadsky National Library web-site, making e-mail listing for scientists, carrying out seminars, inviting colleagues from Europe to make presentations, especially towards “Horizon 2020”. One of the results of the JSTCC work would be the **launch of coordinated calls between Ukraine-EU** as competitions potentially promoting, among others, the RI cooperation between EU and Ukraine. Such measures with co-financing would demonstrate that the European scientific and technological cooperation with Ukraine is moving in the direction of equal partnership between the parties on the basis of the exchange of experience, which is also reflected in the implementation of partnership programs.
6. In the field of **e-Infrastructures**, successful cooperation with Ukrainian partners should be preserved and further developed.
7. In terms of new research infrastructures, the interest and participation of Ukraine in the "ESFRI roadmap" should be expressed in the fact that **Ukraine will be promoting more RI projects with more global or distributed nature**.
8. For this purpose it is necessary
    a. To hold in Ukraine a number of information events to raise awareness of Ukrainian scientists on existing RIs in Europe and possibilities for joining them by Ukrainian research teams, as well as,
    b. to prepare a "Roadmap of RIs in Ukraine", for potential participants in European infrastructures

Proposals for new initiatives

The potential for cooperation between Ukraine and the EU in the field of scientific and research infrastructures is quite high. The confirmation of this thesis is that some institutions already have received an invitation to join on-going RI consortium. Particularly, this is true about EU-OPENSCREEN project and opportunity for the Institute of Molecular Biology and Genetics of the NASU and suggestion from Institute of Medical Biology of PAN.

The potential list presented below of EU RIs that would be complemented by Ukrainian RIs can be proposed according to wiliness and capacities of appropriate institutions.

European RI	Ukrainian RI
Euro Argo - European contribution to Argo program http://www.euro-argo.eu/About-Euro-Argo/	The Marine Hydrophysical Institute of the NASU (MHI), Ukrainian Hydrometeorological Institute (UHMI)
EMBRC – European Marine Biological Center http://www.embrc.eu/	The Institute of Biology of Southern Seas of the NASU (IBSS)
INSTRUCT -"Integrated Structural Biology Infrastructure for Europe" http://www.instruct-fp7.eu/	R.E.Kavetsky Institute of Experimental Pathology, Oncology and Radiobiology of the NAS of Ukraine
BBMRI – Biobanking and Biomolecular Resources Research Infrastructure http://www.bbmri.eu/	R.E.Kavetsky Institute of Experimental Pathology, Oncology and Radiobiology of the NAS of Ukraine
IRAM is an international research institute for radio astronomy http://www.iram-institute.org/	The Institute of Radio Astronomy (IRA) of the NAS of Ukraine, Crimean astrophysical observatory

Table 1: List of potential RI co-operations between Ukraine and EU

PROJECT IDENTITY

Project Name	Enhancing the BILATeral S&T Partnership with UKRraine * Advanced INnovative Approach (BILAT-UKR*AINA)
Consortium	• Centre for Social Innovation (ZSI), Vienna, Austria (Co-ordinator) • Kyiv State Center for Scientific an Economic Information (NIP) • Centre for S&T Potential and Science History Studies (named after G.M. Dobrov) of the National Academy of Sciences of Ukraine (STEPS) • National Centre for Scientific Research, France (CNRS) • German Aerospace Center – International Bureau of the Federal Ministry of Education and Research, Germany (DLR) • Polish Academy of Sciences, Poland (PAN) • Research & Development Engineering and Manufacturing for Automation Equipment and Systems, Romania (IPA SA) • Center of Practical Informatics of the National Academy of Sciences of Ukraine (CPI NASU) • Regional Centre for Information and Scientific Development (RCISD)
Funding Scheme	7th European Framework Programme for RTD of the European Union, Capacities Programme, Coordination and Support Action. Project ID:FP7-311839
Duration	1 September 2012 – 30 June 2015
Website	www.bilat-ukraina.eu
Author	Karina Shakhbazyan and Marina Gorokhovatska (NASU)
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Further reading	Policy briefs on • Overview of the internationalisation of Ukraine in STI including recent trends and developments (Policy Brief 1) • Take-up of the EU-Ukrainian JSTCC Thematic Priorities in FP7 (2007-2013) (Policy Brief 2) • Coordinated and Joint Calls (Policy Brief 3) • Statistics on the number of EU researchers in national Ukrainian R&D programmes (Policy Brief 4)
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