

RESEARCH INFRASTRUCTURE ROADMAP FOR KOSOVO*



**RESEARCH
INFRASTRUCTURE
ROADMAP
FOR KOSOVO***

* This designation is without prejudice to positions on status, and is in line with UNSCR 1244 and the ICJ Opinion on the Kosovo declaration of independence

good. better. regional.

Title: Research Infrastructure Roadmap for Kosovo*

Publisher: Regional Cooperation Council
Trg Bosne i Hercegovine 1/V, 71000 Sarajevo
Bosnia and Herzegovina

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March 2022

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EXECUTIVE SUMMARY

The Ministry of Education, Science and Technology is responsible for preparation and implementation of the Research Infrastructure Roadmap for Kosovo*.

According to the EU Progress Report (2020),¹ there is a lack of effort by Kosovo* institutions towards the integration into the European Research Area, which prioritises efforts towards more effective economy's research systems, and trans-economy cooperation, including research infrastructure, among others. One way for Kosovo* institutions to contribute in this regard is to embark on continuous investments in research infrastructures since investing in research infrastructures contributes to meeting the challenges of the European Research Area and presents a key element and a prerequisite for conducting quality research and innovation.

Despite the fact that development of research infrastructures has been selected as one of the priorities by the National Science Programme of Kosovo* approved more than a decade ago (2010), the lack of research infrastructures is one of the largest barriers to research activities in Kosovo*, where integrated scientific research information system does not exist even though it was also planned to be established. Accordingly, there is a pressing need to leverage research infrastructures since there is little or no access to renowned research infrastructure and no institutional support for excellent research.

As a result of the current state of play and in order to improve the quality of research infrastructure in Kosovo*, the following recommendations are put forward:

1. **Improve the availability of statistical data in the area of research, technological development and innovation. Due to the lack of reliable statistics, it is difficult to determine the current state of play in the research sector and to make comparative analyses with regional peers. The availability of data and investment in the concept of open data are the important steps for further development of research infrastructure in Kosovo*.**
2. **Increase investments in research infrastructures. To get closer to other economies in the Western Balkans, it is necessary to allocate more funding to research infrastructures. For this purpose, Kosovo* should invest in modernising the research equipment located at universities and research institutes. Additionally, the Government should allocate sufficient funds for the effective implementation of National Science Programme.**
3. **Improve e-infrastructures through enabling further development of KREN and achieving membership of National Library in COBISS Platform. Kosovo* Research and Education Network (KREN) has been recently established with the support of the World Bank and the Ministry of Economy and Environment in the framework of KODE project. However, in order for the KREN to continue to develop after the project completion, it is important to consider future needs and investment in further development to enable access to high-speed and better quality broadband services for students, researchers and educators in Higher Education Institutions. Inclusion of the National Library in COBISS system should be considered to make the online bibliographic system more operational and transparent.**

¹ European Commission (2020). Kosovo* 2020 Report, Commission staff working document, Brussels, 6.10.2020

4. Improve the legal and strategic framework for development of research infrastructures. The term “research infrastructure” is recognised and clearly defined (Article 3) by the current Law on Scientific Research Activities. However, it is desirable to provide a definition of the term “Research Infrastructure Roadmap” that would include clear purpose of the document in order to create a legal basis for the development and adoption of this policy document. All institutions, individuals, infrastructures, equipment and facilities part of scientific and technology development should be subject to information processing and retrieval in the context of designing RI Roadmap: collection of necessary data, creation of databases, data and information security and exchange, analysis and statistical processing. Article 17 of the Law defines the obligation of the legal research entities, financed by the public budget, to develop a research infrastructure development plan. In accordance with that the Ministry of Education, Science and Technology should initiate the development of a research infrastructure development plan by universities and research institutes in accordance with the Law. Creation of a research infrastructure development plan by research entities would greatly contribute to a more transparent process and opportunities for more efficient management of research infrastructure at the economy level. The National Science Programme was approved in 2010, however with no updates in the meantime. It is recommended to update the current Strategy or to draft the new one in accordance with the latest developments, trends and new research goals.
5. Establish a distinct separation between teaching and research. Generally speaking, Kosovo’s* universities are teaching-oriented institutions. Therefore, research is not an organic component of higher education institutions and academic staff daily work. Conducting research is perceived as a periodic activity. To improve this situation, it is recommended to establish a distinct separation between teaching and research.

1. SCOPE NAD PURPOSE OF THE DOCUMENT

Scientific research in Kosovo* is in the early stage of development with the prevailing ad-hoc approach in the planning of research facilities development. Research policies have been managed in a non-systemic way with little regard for the collective infrastructure landscape of the economy and long-term planning.

In the past two decades, policy makers in charge of scientific research in Europe have increasingly begun to systematise planning around research infrastructures (RI). They have made remarkable progress in recent years with the implementation of the European Strategy Forum on Research Infrastructures (ESFRI) roadmap, integrating and opening domestic research facilities and developing e-infrastructures underpinning a digital European Research Area (ERA). The ESFRI, formed in 2002, is a strategic instrument to develop the scientific integration of Europe and to strengthen its international outreach. The competitive and open access to high quality Research Infrastructures supports and benchmarks the quality of activities of European scientists, and attracts the best researchers from around the world. The ESFRI Roadmap identifies new Research Infrastructures of pan-European interest corresponding to the long-term needs of the European research communities, covering all scientific areas, regardless of possible location. In accordance with ESFRI, EU members have developed the domestic research infrastructure roadmaps to define a long-term plan for the development of their research infrastructures, improve the mobility of researchers, increase research excellence, etc. Guided by this initiative, some of the Western Balkans economies, specifically Serbia and Montenegro, have also created the roadmaps for research infrastructures.

This document represents the first attempt to create Research Infrastructure Roadmap of Kosovo* with the aim to identify research potential in the economy in order to create a basis for further development of research infrastructures. RI Roadmap provides insight into the current state and quality of research infrastructures, which contributes to making better decisions for future progress of research in Kosovo*. In addition to providing important information to policy makers, this document may also be of interest to the wider research community as it provides a basis for potential research collaboration. In addition, the Roadmap should serve as major instrument for integration of research and innovation community with economy and society of Kosovo*.

Research infrastructure roadmaps developed by EU member states generally follow a similar approach to identifying large research infrastructures, pan-European research infrastructures as well as those research infrastructures that have a high potential to become the members of ESFRI. The most common objectives of EU member states for developing RI Roadmaps include: improving effectiveness of investments, strategic long-term planning and linkages with EU and ESFRI projects. The process of developing a roadmap can be very beneficial as it can motivate the scientific community to mobilise themselves, develop high quality proposals and think strategically about their projects (as well as take into account the financial implications of their ideas).

However, considering the real situation and current level of development of the research infrastructure in Kosovo*, a slightly different approach has been adopted in this document. Research Infrastructure Roadmap of Kosovo* was created with the aim of analysing research infrastructures and identifying the research potential that exists at the economy level in order to create a basis for future decisions in the development of research infrastructure. The focus is on

identification of research equipment within research institutions, which indicates the research potential of Kosovo*.

1.1. What are Research Infrastructures?

Research Infrastructures are an essential component of every scientific system and a necessary condition for implementation of research projects and research excellence. Research Infrastructures help advance basic research, provide access to new research areas, promote the transfer of knowledge and technology, increase research mobility, etc. They include a wide range of tools, laboratory facilities, large-scale equipment, research instruments, collections of materials, libraries, databases, networked computer equipment, etc. A general feature of research infrastructures is that they are essential for the research community to conduct top quality research in all fields of science.

Although the basic purpose of research infrastructure is common, the main definition of research infrastructure varies to some extent between different countries of the world. Having in mind the different definitions and meanings of research infrastructure, this document relies on the official definition given by the European Union. The EU uses the following definition of Research Infrastructures as defined by Article 2 (6) of the Regulation (EU) No 1291/2013 of 11 December 2013 - "Establishing Horizon 2020-the Framework Programme for Research and Innovation 2014-2020":

RIs are facilities, resources and services that are used by the research communities to conduct research and foster innovation in their fields. They include: major scientific equipment (or sets of instruments), knowledge-based resources such as collections, archives and scientific data, e-infrastructure, such as data and computing systems and communication networks and any other tools that are essential to achieve excellence in research and innovation. Accordingly, RI are implemented along different organisational models, including central sources and laboratories for experiments and measurement sessions, coordination and management of geographically distributed observatories or laboratories, remotely accessible resources for computing, data banks, physical sample repositories, surveys and longitudinal studies.

Research infrastructures can be centralised, that is, based in a single location. They can also be distributed or virtual, and can form mutually complementary wholes and networks. A distributed RI consists of a central hub and interlinked domestic nodes and needs to have a unique specific name and legal status and governance structure with clear responsibilities and reporting lines; have legally binding attributions of coordination competences and resources to the central hub; have a common access policy and provide for a single point of access for all users with a support structure dedicated to optimise the access for the proposed research; have a user programme designed to absorb a considerable part of the total capacity of the RI; etc. A single-site RI is a geographically localised central facility designed for user access whose governance is domestic or international. A single-site RI needs to have a legal status and governance structure with clear responsibilities and reporting lines, have an access policy and access point for external users; have a user support structure in place to optimise access, such as user's office space, ancillary laboratories, accommodation arrangements and logistics; have a data management system allowing for easy storage, retrieval of data; etc.

It should be noted that the above-mentioned definition of research infrastructures is applicable to developed European countries that have a large research infrastructures relevant for the use at the European level and that offer exceptional research excellence. This document considers that the research infrastructure in Kosovo* is modest, and generally does not meet the requirements defined by the ESFRI methodology. Accordingly, the research infrastructure in this document includes research facilities and equipment within the scope of research institutions (universities and research institutes), the purpose of which is to provide basic conditions for research activities. The Roadmap will distinguish single-sited infrastructure and e-infrastructures which have at least domestic relevance in their field of science.

1.2. Background of the development of research infrastructures roadmap

This document has been developed in close cooperation with the Regional Cooperation Council (RCC) that provided technical assistance to the Ministry of Education, Science and Technology of Kosovo* in this assignment. The technical assistance was provided as a part of a broader action that included the provision of assistance to other Western Balkan economies with the final goal to contribute to creating the Western Balkans' Roadmap of Research Infrastructures (WBRI).

The RI Roadmap of Kosovo* was prepared by implementing two research methods: desk research and field research.

Desk research was conducted by analysing existing legal framework and policy documents in the area of research, technological development and innovation in Kosovo*. All documents that were subject to the analysis are official and approved government documents accessible to the general public. The policy framework was analysed in the context of the current development of research infrastructures. The specific focus was on the following: the current state of research sector; reviewing the existing strategies on research and innovation; financial framework and the current status of the process of developing smart specialisation strategy.

Besides desk research, field research was conducted which involved sending out a survey questionnaire to the research community in order to collect information on existing research infrastructures and equipment with domestic and international relevance. The Ministry of Education, Science and Technology was in charge of launching questionnaires and gathering the answers that were processed and analysed by the team of external experts.

The survey questionnaire is provided in Appendix 2 and detailed instruction for launching and conducting the survey is provided in Appendix 3. The guide comprises detailed instructions for sending out the questionnaire to the research community, gathering and processing necessary data, and integrating all responses that served as main input for selection and mapping of research infrastructures in Kosovo*.

2. THE CURRENT LEGAL AND POLICY CONTEXT

The legal and policy framework for the research and development policy management in Kosovo* is in place. This means that competencies, legal and policy documents related to the regulation of research activities and research infrastructures are clearly defined. However, according to EU Progress Report (2020)², Kosovo's* research and innovation policy is underdeveloped. Kosovo* is at an early stage of science and research development policies. Many key provisions defined by laws remain unimplemented including the requirement to develop Kosovo's* wide research programme. As a result, there is no strategic approach to the development, prioritisation and promotion of research activities. As reported by EU Progress Report (2020), limited progress was made during the reporting period. Key recommendations provided by the Progress report are the following:

- ◆ develop a strategic approach to the development, prioritisation and promotion of scientific research and innovation and ensure higher government spending on research;
- ◆ seek to stimulate investment from the private sector by completing a Smart Specialisation Strategy;
- ◆ continue efforts on increasing participation in the EU's Horizon 2020 programme;
- ◆ provide statistical data on numbers of researchers, percentage of GDP spent on research and innovation, and performance related to the European Research Area priorities.

The Ministry of Education, Science and Technology is responsible for the development of scientific research, higher education system and technological development. The legal framework for science and research activities in Kosovo* is defined by the Law on Scientific Research Activities (Law No. 04/L-135). This Law aims to support the scientific research activities and research results and has a significant impact on the development of society and economy in Kosovo*. According to the Law, eligible entities for scientific research in Kosovo* are:

1. Academy of Sciences and Arts of Kosovo*;
2. Institute of Albanology;
3. Institute of History; and
4. Universities.

With regards to funding research activities, the Law defines investments in research of at least 0.7 percent of GDP. In the context of developing RI roadmap, it is important to emphasise that the term research infrastructure is defined in this Law as follows: „Research infrastructures include facilities, equipment and services necessary for scientific research activities, such as laboratories, libraries, professional and scientific journals, archives and all other sources with scientific content“.

Strategic framework and research policy in Kosovo* is based on the National Science Programme (2010) and Education Strategic Plan (2017-2021). These two documents depict the main objectives of the policies, and the actions for each respective objective. Both strategies focus on scientific research development and treat it as a means to the socio-economic development of Kosovo*.

² European Commission (2020). Kosovo* 2020 Report, Commission staff working document, Brussels, 6.10.2020

2.1. Kosovo* Science Programme

The National Science Programme (NSP) was developed in 2010 aiming to identify scientific priorities, create conditions for infrastructure investments, strengthen participation in international scientific research projects, and develop enabling environment for researchers.

As a result of series of stakeholder discussions, the NSP has defined 5 research priority areas:

1. Natural Resources, Energy and Environment
2. Agricultural Production and Food Safety
3. Scientific Research in Medicine
4. Social and Economic Studies
5. Linguistic, Cultural and Historical Studies

In addition, Information and Communication Technologies are considered as a cross-cutting priority of all the above-mentioned fields.

The following criteria were considered when research priority areas were finally selected:

- ◆ Relevance to the economic and social development of the economy,
- ◆ Number and quality of human resources in the economy and in the diaspora,
- ◆ Current development of research infrastructure,
- ◆ Contribution to the preservation and promotion of Kosovo's* identity,
- ◆ Potential to achieve research results and apply them in the economy and abroad,
- ◆ The level of international cooperation in a certain field.

NSP aims to support socio-economic development of the economy by focusing on the following objectives:

1. Development of research personnel,
2. Development of research infrastructures,
3. Increasing the level of internationalisation of research activities,
4. Strengthening the link between science and economy,
5. Support to research excellence.

By focusing on the abovementioned objectives, NSP tends to support young researchers by developing high quality PhD programmes and supporting them in their studies at home and internationally. Furthermore, based on the identified Kosovo's* priorities, the government funding should be directed to the most promising research fields. Other objectives are focused on: enhancing the joint research projects between Kosovo* and other economies and providing support for Kosovar researchers to publish reports in international journals; narrowing the gap between science and business sectors, recognising the most prominent researchers in Kosovo* and establishing a centre for scientific excellence.

2.2. Kosovo* Education Strategic Plan (2017-2021)

Kosovo* Education Strategic Plan (KESP) regulates the education system in Kosovo*. Having in mind that higher education institutions are entitled to conduct scientific research in Kosovo*, this strategy is important for the development of RI roadmap. The following results expected of the Strategy are related to the development of scientific research in higher education institutions:

- ◆ **Advanced infrastructure for teaching, research and artistic work.** To achieve this objective, the Strategy has foreseen drafting of an infrastructure needs assessment of the laboratories and equipment needed for scientific research, and provision of institutional support for development of the required infrastructure. Furthermore, it requires development of plans, rules and regulations for equipment maintenance.
- ◆ **The total number of research papers in international indexed journals increased by 25% on a yearly basis.** To achieve this objective, the activities foreseen in the Strategy include analysis and development of action plans for research activities; support to publication of reports in internationally indexed journals; provision of access to international electronic libraries; and establishment of an economy-level scientific researcher registry.
- ◆ **Increased participation in international research programmes.** To achieve this objective, dedicated financial support for 50 project proposals to European programmes such as Erasmus+ and Horizon 2020 and holding of up to 50 informative sessions about international research opportunities are envisaged.

2.3. Smart Specialisation Strategy

The Smart Specialisation (S3) process has been initiated but it is still at an early stage. Kosovo* is among the non-EU economies that have initiated their S3 process development in 2018. Once began, Kosovo's* S3 process should follow the Joint Research Centre (JRC) methodological framework for smart specialisation in the EU enlargement and neighbourhood economies.

The upcoming mapping phase will most likely be challenging because most statistical data is not available in Kosovo*. During the quantitative mapping phase, new and innovative ways of measuring and assessing the economic, scientific and innovative potential of regions and sectors will have to be developed and applied. Wide-ranging technical assistance will be necessary to compensate for the absence of relevant statistical data.

2.4. Financial Framework

Scientific research activities in Kosovo* are funded from internal and international sources. Speaking about internal sources, R&D activities are mainly funded by the government. However, according to the Education Strategic Plan (2017-2021), the total government spending on R&D is substantially low: 0.1% of GDP, even though the Law on Scientific Research Activities has defined that R&D expenditures should increase to 0.7% per annum.

Currently, the main sources of international funds according to the EU Progress Report (2020) are two long-term bilateral projects with Austria (HERAS) and USA (TTL) that amount up to 11 million euros.

There are a host of international donors providing support to higher education and research activities in Kosovo*. However, the majority of supported programmes are aimed at enhancing institutional capacities and supporting human resources development. The projects that are focused on development of research infrastructures are almost negligible.

Due to the lack of reliable statistics, it is difficult to determine the total investment in research infrastructure. However, it is evident that there is no clear plan for investing funds in large research infrastructure. Also, investments in research equipment by universities and research institutes are very modest, while investments in equipping research laboratories are sporadic.

2.5. Research priorities

This section summarises the current state of research priority areas defined by the National Science Programme. The particular focus is on the actual state of research infrastructures and human capacities in these fields.

2.5.1. Natural Resources, Energy and Environment

Most of the energy in Kosovo* is provided from fossil fuels, coal and oil. There is no apparent concern about the negative environmental and social consequences of their use. Although the current research activities in this field are poor, this was selected as a research priority due to a necessity to ensure a better quality of life, clean and environmentally sustainable environment and future accession to the European Union.

In general, research capacities do not cover all scientific research disciplines within the environmental sector. Moreover, the existing research activities are of a basic character and, in many cases, are characterised by individual initiatives.

In order to improve scientific research activities in all areas of environment, energy and natural resources, further actions are needed towards development of human capacities in applied research. There is a solid basis for cooperation with international research institutions, mainly on the basis of individual initiatives, and this has resulted in a number of joint projects and publications in international journals.

With regards to research infrastructure in this field, in comparison to the global standard, research infrastructures do not meet the quality criteria. The human resources are trained for the use and maintenance of the existing research infrastructure, so the new infrastructure will require human capacity building.

2.5.2. Agricultural Production and Food Safety

Research activities in the field of agricultural production and food safety are poor despite the fact that agriculture is one of the most important economic sectors in Kosovo*. Agricultural production is characterised by traditional production systems, and to successfully manage the transformation of Kosovo's* agriculture towards modern production, it is necessary to increase research activities and scientific results in this field.

Generally speaking, the total number of researchers in the field of agricultural production and food safety in Kosovo* is relatively small, and most of them are employed in public institutions (University of Pristina and public scientific research institutions). Scientific research activities remain sporadic and marginal, based mainly on individual initiatives within the academia. In recent years, good cooperation has been established with several universities, and regional and international institutes.

Strengthening human resources is very important in order to improve the current situation and create more efficient agricultural production and food security system.

2.5.3. Scientific Research in Medicine

Although research activities are sporadic and marginal, based mainly on individual initiatives in the university sector, there is evidence of increased cooperation with international research institutions. However, international cooperation is mainly at the level of human capacity building. Significant support for research in the field of health in Kosovo* has been provided by international organisations such as WHO, UNICEF, USAID, etc.

Over the last decade, many young researchers from various fields of medicine have conducted studies and specialisations in many prestigious universities worldwide, so there is solid expertise from the diaspora.

There is a need for better equipped research laboratories. Research staff is trained only for the use and maintenance of existing research infrastructure, so the new infrastructure will require human capacity building. The legal framework for experimental research needs to be completed and adopted in accordance with the International Convention. Priority topics in the field of scientific research in medicine are:

- ◆ Development of scientific research activity in the field of basic medicine (genetic, immunological and therapeutic research);
- ◆ Development of scientific research activity in the field of clinical medicine (research of cardiovascular diseases and oncology) and
- ◆ Development of scientific research activity in public health (prevention and control of infectious diseases, mental health, maternal and child health and dependence on various substances).

2.5.4. Social and Economic Studies

Economic development, employment and increased competition are important challenges that Kosovar society faces nowadays. Scientific research in Social and Economic Studies should provide the key inputs to policymakers regarding their strategic decisions for future economic structure, education strategy, legal framework, etc. Research activities should develop new knowledge for more effective use of all human, natural and financial resources of Kosovo* towards development of a new knowledge-based society; to enable integration into international markets through the development of an appropriate economic structure and adequate skills; and attract foreign investment by ensuring institutional stability, the rule of law and public safety.

Due to the lack of capacity for research design in the field of social sciences, publications of Kosovar authors in reputable journals are rare, and are mainly the result of cooperation of Kosovar authors with international institutions or joint research during their visits to foreign research institutions. Lack of incentives for research activities in Kosovo* has reduced the activity of researchers returning from abroad, and as a result, they have become passive researchers pushed to engage in other activities such as teaching or non-scientific consulting.

The social sciences are not very dependent on laboratories. Some basic IT offices and equipment are available in social science institutions. The main problem for research in the field of social sciences in Kosovo* is the lack of official statistical data on economic and social developments. The government and government agencies have not developed a reliable database regarding major economic and social processes. One of the biggest concerns for future research is the poorly equipped libraries and limited access to international scientific journals in Kosovo's* libraries.

Research and educational institutions should be developed within the integrated framework of the effective triangle (education-science-innovation), cultivating the lifelong learning habits of researchers and collaborating with important international research centres.

2.5.5. Linguistic, Cultural and Historical Studies

Kosovo* has a considerable number of scholars in the field of linguistics. However, the state of research infrastructure in linguistics does not differ from that in other fields of research. In general, the conditions for research in linguistics do not conform to contemporary standards. At institutional level, research infrastructure which would ensure sustainability and continuity of cultural studies in Kosovo* is insufficient. The situation with historical studies is better, as the existing research infrastructure sufficiently supports implementation of research projects. However, necessary infrastructure for archaeological expeditions, restorations and revitalisations, archiving of documents and museum materials is missing.

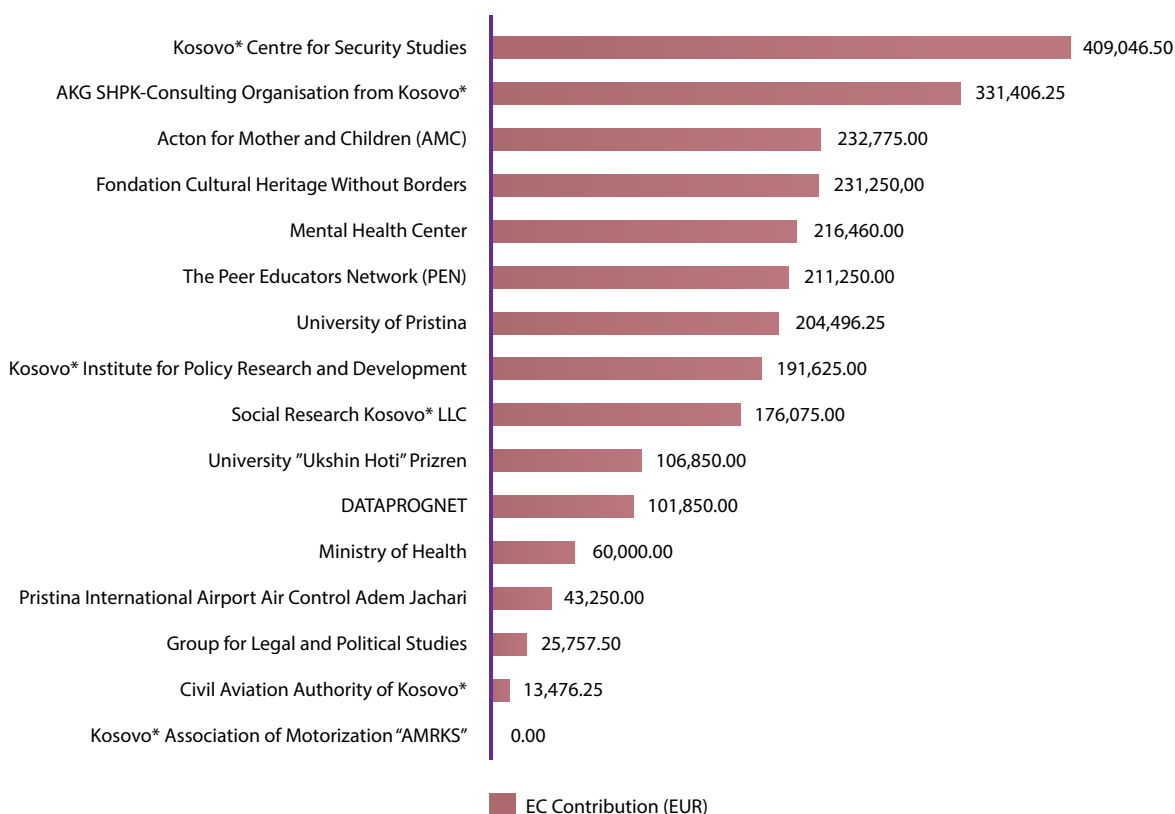
3. COOPERATION WITHIN EUROPEAN RESEARCH AREA

Internationally, Kosovo* is working towards integration in ERA. Kosovo* joined the European Cooperation in Science and Technology (COST) in April 2018, which enables researchers to participate easily in research and innovation meetings all over Europe. Furthermore, in June 2018, Kosovo* signed the Agreement on Participation in ERASMUS+, EU Programme for Education, Training, Youth and Sport.

With regards to framework programmes, Horizon 2020 has become the main international cooperation programme for Kosovo* allowing cooperation with EU Member States and beyond. Until February 2021, Kosovo's* entities participated in total of 21 H2020 grant agreements, receiving up to 2.56 million net EU contribution. 113 organisations applied for H2020 grants and 16 were involved in relevant projects/received grants.

Within the implemented projects, the largest number of project partners were from Germany (total of 24), followed by Spain (22), Great Britain (22), the Netherlands (16) and Italy (15). Figure 1 shows organisations from Kosovo* that have participated in H2020 projects. Kosovo* Centre for Security Studies and AKG Consulting have received the highest EU net contribution so far.

Figure 1: Participation of Kosovo* organisations in H2020



Source: Own calculations based on: <http://cordis.europa.eu>

Looking at participation by thematic priorities, 6 projects were implemented under “Europe in a changing world - inclusive, innovative and reflective Societies”, 5 projects under “Health, demographic change and wellbeing”, 3 projects under “Information and Communication Technologies” and less than 2 projects in other thematic priorities.

Kosovo* participation in FP7 was even more modest than in H2020. Only 7 grant agreements have been signed receiving 344.135 euro of EU net contribution.

Despite the fact that participation of Kosovo’s* researchers is getting better every year, the overall performance could still be improved. Actions have been taken in this respect, in particular, with the National Contact Points (NCP) network becoming fully operational. Engagement through more training, better linking of researchers, exchange of best practice and mentoring with other NCPs constitute the main supporting structure to provide guidance, practical information and assistance regarding all aspects of participation in Horizon 2020. Currently, there are 9 NCPs and one NCP Coordinator.

4. ANALYSIS OF THE EXISTING RESEARCH IN KOSOVO*

4.1. Overview of research infrastructures

Considering the general situation in the research and development sector, Kosovo* has made certain progress in development of research infrastructures. This has been especially evident over the last few years, with more active participation of Kosovo* in the European Research Area. However, the lack of research infrastructure, physical space, research tools, instruments, equipment and labs is still present.³ In addition, the existing research infrastructure does not meet the basic quality requirements for top research results. Lack of research infrastructures puts research institutions from Kosovo* at a disadvantaged position as consortium partners in international research programmes such as Horizon 2020. The current research conditions are an important factor when deciding on establishing a consortium for a project proposal. Therefore, applying for research calls, which are highly competitive, is challenging for Kosovo's* universities and research institutes. It is clear that research is not a priority for universities, with most of the funding allocated to teaching.

According to the Law on Scientific Research Activity, eligible entities for scientific research in Kosovo* are: Academy of Sciences and Arts of Kosovo*; Institute of Albanology; Institute of History and Universities. There are 7 Universities in Kosovo*: University of Pristina "Hasan Prishtina"; University of Prizren "Ukshin Hoti"; University of Peja "Haxhi Zeka"; University of Gjakova "Fehmi Agani"; University of Mitrovica "Isa Boletini"; University of Gjilan "Kadri Zeka" and University of Applied Sciences in Ferizaj. Additionally, there are two colleges: AAB-College and the University for Business and Technology and three institutes: Albanological Institute, Institute of History and Pedagogical Institute.

In January 2020 Ministry of Education, Science and Technology launched the survey to gather data on research infrastructures and equipment, covering all relevant research institutions in Kosovo*. Out of 7 universities, 2 colleges and 3 institutes, only University of Pristina "Hasan Prishtina", University of Mitrovica "Isa Boletini" and private University for Business and Technology responded and filled out the questionnaire. The response rate was evidently rather low. However, it should be noted that the University of Pristina "Hasan Prishtina" is the largest university in terms of size, capacity, budget, and research infrastructure. Therefore, with questionnaire being filled out by this University, it is considered that most of the available research infrastructure located at the universities has been identified.

According to the survey results, University of Mitrovica "Isa Boletini", University of Pristina "Hasan Prishtina" and private University for Business and Technology possess capital research equipment worth over 50,000 euros. The full list of capital equipment is presented in Appendix 1.

The section below presents the current state of research activities and research infrastructures at the institutions that provided answers to the questionnaire.

³ European Commission (2020). Kosovo* 2020 Report, Commission staff working document, Brussels, 6.10.2020

1. University of Pristina "Hasan Prishtina"

University of Pristina "Hasan Prishtina" (UP) is the biggest university in Kosovo*; consequently, it accounts for the largest share of research infrastructure of Kosovo*. It has fourteen faculties and several laboratories. The equipment and other facilities are situated at the laboratories of the respective faculties. Some of the laboratories are equipped and well operating, but most need considerable investment to make them fully operational.

In its Strategic Plan 2020-22, the University management focused on improving the research infrastructure, with the aim to achieve the highest performance. The Strategy set up the objectives for improvement of the existing infrastructure and building new capacities, with the intention to:

- ◆ Provide classrooms and laboratories equipped with the relevant tools and technology, depending on the needs of the programmes;
- ◆ Provide comfortable reading facilities by equipping libraries with computers for access to e-libraries and the necessary equipment to facilitate the learning process;
- ◆ Improve infrastructure for persons with disabilities in the UP facilities;
- ◆ Create conditions for scientific activities in cooperation with international institutions;
- ◆ Develop UP infrastructure database and inventory for all Faculties.

Total estimated value of research capital equipment is 1,069,447.40 (EUR).

Cooperation: University of Pristina has already signed a dozen of international cooperation agreements and partnerships which included research infrastructure. These cooperation agreements have been signed with:

- ◆ Albert-Ludwigs-Universitat Freiburg (Germany)
- ◆ Ankara University (Turkey)
- ◆ Ansbach University of Applied Sciences (Germany)
- ◆ Drake University (USA)
- ◆ Eberswalde University for Sustainable Development (Germany)
- ◆ Emory University (USA)
- ◆ Istanbul University (Turkey)
- ◆ James Madison University (USA)
- ◆ Kinki University (Japan)
- ◆ Knox Community College (UK)
- ◆ L'Universite Paris Ouest Nanterre La Defense (France)
- ◆ Pamukkale University (Turkey)
- ◆ Riga Technical University (Latvia)
- ◆ Selcuk University (Turkey)

- ◆ The University of Northern Iowa, (USA)
- ◆ Umea University (Sweden)
- ◆ University Nice Sophia Antipolis (France)
- ◆ University of Hohenheim (Germany)
- ◆ University of Camerino (Italy)
- ◆ University of Granada (Spain)
- ◆ University of Graz (Austria)
- ◆ University of Ljubljana (Slovenia)
- ◆ University of Maribor (Slovenia)
- ◆ University of Milan (Italy)
- ◆ University of Rome La Sapienza (Italy),
- ◆ University of Sarajevo (Bosnia and Hercegovina)
- ◆ University of Zagreb (Croatia)

Services provided: UP research infrastructure is mainly used by the academic staff and its researchers and students. They use it for teaching/learning purposes, for their theses (BSc., MSc. and PhD), implementation of research projects, to conduct research and foster innovation. Furthermore, the research infrastructure is used to provide services to the community, but such services are in the initial phase.

Access Policy: Research infrastructure at the University of Pristina is accessed by the students (BSc. MSc. and PhD) for teaching purposes, students' research (diploma theses at a different levels) and other projects implemented under the supervision of the respective mentors, as well as by the researchers (academic staff, researchers, employed students in research) to implement domestic and international research projects. Research infrastructure could be also accessed by researchers of other institutions in Kosovo* based on the agreement and financial terms and conditions. Furthermore, the research infrastructure could be accessed by international students and researchers as part of project cooperation and exchange programmes.

2. University "Isa Boletini" in Mitrovica (UIBM)

The University of Mitrovica "Isa Boletini" (UMIB) is a public university with six faculties: Faculty of Geosciences, Faculty of Food Technology, Faculty of Mechanical and Computer Engineering, Faculty of Law, Faculty of Economics and Faculty of Education. The total number of programmes accredited at UMIB until September 2019 was 20 study programmes at two levels: Bachelor and Master. UMIB employs 97 full-time academic staff, and 46 administrative staff. The total number of students in the academic year 2019/20 was 1.812.

The objective of research infrastructure is to provide research and professional development opportunities for UMIB academic staff, researchers, and students, primarily in geosciences (geology, mining and metallurgy), food engineering and technology, as well as mechanical

and computer engineering. By providing open access to research infrastructures, UMIB aims to cooperate with external researchers and local and international private sector.

According to the budget planning for 2021 and budget forecast for 2022/23, 1.56 mil EUR is planned for capital investments in the period 2021-2023. There is no detailed investment plan, but these investments will mainly go to research laboratory equipment.

Services provided:

- ◆ Geo-mechanical tests
- ◆ Food analysis
- ◆ Geological analysis
- ◆ Water and wastewater analysis

Total estimated value of research capital equipment is: 375.329 EUR

Access Policy: The UIBM has been part of the Regional Cooperation Council's support programme which established the Network of Open Access Research Infrastructures in the Western Balkans. The UIBM has drafted the policy for open access to research infrastructure, which is considered as an additional opportunity for investment in laboratory equipment.

3. University for Business and Technology (UBT)

The University for Business and Technology (UBT) is the private university located in Pristina. UBT reported that it owns more than 100 research laboratories covering various research areas. However, not all laboratories are currently operational. The list of equipped laboratories as well as the total value of research equipment owned by the laboratories is provided in Appendix 1.

UBT is supporting enterprises and community by offering a wide spectrum of support services falling in its academic and business expertise. The service domain involves numerous partnerships with relevant public and international institutions, and private enterprises. As an established and successful private University, the UBT aims to become the top University in Kosovo* in terms of research excellence. It aims to be recognised as an outstanding, supportive research environment attracting staff and research students of the highest profile.

UBT has over 400 partners worldwide and is oriented towards increasing the level of integration of its research infrastructures with the current partnering institutions and potential future partners.

UBT has been working on increasing the capacities of research infrastructure in order to achieve its goals and objectives. The Horizon 2020 European Research Fund will be the main focus of UBT to increase its research capacities both through establishing new partnerships and acquiring new research equipment in the upcoming years.

Services provided:

- ◆ Office utilities
- ◆ Appropriate and fully equipped premises
- ◆ Professional and highly experienced staff network

- ◆ Group working spaces and utilities
- ◆ Consultancy for advanced project development
- ◆ Supporting staff
- ◆ Tools and infrastructure for sharing research results/publications
- ◆ Appropriate opportunities for project and/or result sharing
- ◆ Flexible working hours and mobility opportunities

Moreover, the UBT offers the following services and research activities:

- ◆ Free access to the academic platforms (Sage, Jstor)
- ◆ Research trainings
- ◆ Free access to labs
- ◆ Organisation of conferences
- ◆ Involvement of UBT staff in applied research activities

The total current value of research equipment is estimated at 1.5 mil. euros. Most of the existing research equipment located at the labs was funded by own resources (UBT).

There is no official Access Policy. Access of external users is allowed.

4.2. Access Policy

Research infrastructures at universities of Kosovo* are mainly accessed by employed research staff and students for education purposes, student's individual research and other student projects implemented under the supervision of the respective mentors.

Research infrastructures are also accessible by external researchers in Kosovo* based on the timing and financial terms and conditions approved in advance. Furthermore, the research infrastructure could be used by international students and researchers in the frame of project cooperation and exchange programmes.

In response to the lack of official institutional policies that regulate access to research infrastructure and having in mind that the development of Open Access policies is an essential part of the well-functioning research infrastructures, RCC Secretariat has implemented Open Access Research Infrastructure in the Western Balkans Support Programme (May 2020 - December 2020) to assist development of research infrastructures in the region. The Programme had two specific purposes: to guide the preparation of the Open Access policies for selected Research Infrastructures in the Western Balkans, specifically, Albania, Bosnia and Herzegovina, Kosovo*, Montenegro, North Macedonia and Serbia and to train management, administrative and research staff to introduce principles of Open Access to selected Research Infrastructures in the Western Balkans.

The programme contributed to the development of Open Science practices in the higher education and public research organisations in the region, and it laid the foundation for the establishment of the Network of Open Access Research Infrastructures in the Western Balkans. The Programme resulted in 21 policies developed.

Regarding the institutions from Kosovo*, University of Mitrovica "Isa Boletini" participated in the programme. It has drafted and approved policy for open access to the research infrastructure, while University of Pristina "Hasan Prishtina" also planned to draft a policy on open science and research infrastructure that should provide easier access to research infrastructures by the scientific community in Kosovo* and beyond.

4.3. International projects relevant to capacity building and strengthening of research infrastructure

As a result of the poor state of research infrastructures, the participation of research institutions from Kosovo* in international research projects aimed at development of research infrastructures is reduced to a minimum. Considering this fact, this section provides information on important projects that are relevant for capacity building and strengthening of research infrastructure.

HERAS PLUS Project

The project Higher Education Research and Applied Science Plus - HERAS+ aims at a more competitive and diversified public higher education and research sector in Kosovo* in line with the European Higher Education Area (EHEA), ERA and the United Nations' Sustainable Development Goals (SDG) 4 and 9 related to quality assurance, economy and labour market relevance, international cooperation and the social dimension of higher education. The three-year HERAS+ is being implemented from 2020 to 2023. HERAS+ is a follow-up of the previous phase of the project called 'HERAS' which was implemented by the same donor and same consortium. It is expected that the project will contribute to a higher education and research system in Kosovo* that is better governed, more international, coherent, effective and efficient, fostering students' employability and the third mission of universities.

The project is funded by the Austrian Development Agency (ADA) with funds of Austrian Development Cooperation, and co-financed by the Ministry of Education, Science and Technology. HERAS+ is implemented by a highly experienced Austrian consortium represented by World University Service Austria (WUS Austria) as the lead partner, and including the Centre for Social Innovation (ZSI) and the Austrian Agency for International Mobility Cooperation in Education, Science and Research (OeAD).

The project addresses the following three levels:

- ◆ **Policy level**-the Ministry of Education, Science and Technology is enabled to effectively develop and implement policies along the European standards in HE and research adapted to the domestic context. The systematic focus of this level will shape and further develop a regulatory framework with corresponding mechanisms/instruments that directly contribute to a higher education and research system in Kosovo* that is more coherent, effective and efficient, fostering students' employability and the third mission of universities.
- ◆ **University level**-strategic plans of public universities are reviewed, developed, and decision-making processes are based on these strategies and better contribute to a competitive HE sector as well as to economic, social and cultural development of Kosovo* (in line with the

3rd mission of universities). The systematic focus of this level will be shaping and further enhancing the institutional framework and effective functioning and relevance of HEIs through the implementation of improved strategies, complemented by programmatic partnerships and targeted measures to promote higher education reforms, strong leadership of the public universities, applied study approaches as well as the Social Dimension of Higher Education.

- ◆ **Research level-Kosovo*** has further advanced the quality of its research capacities and the internationalisation / Europeanisation of its higher education and research system. The systematic focus of this level will be contributing to a research system in Kosovo* that is more coherent, effective and efficient and internationalised. This will also contribute to enhanced research capacities at the individual level and thus strengthen the profile and employability of researchers/academics.

KODE Project

The Ministry of Economy and Environment has managed to reach an Agreement with the World Bank on financing Kosovo* Digital Economy Project (KODE). The Government of Kosovo* has received a credit in the amount of €20,700,000 from the World Bank to implement the Project from 2019 until 2023.

This project is expected to be a substantial investment in building the capacity of Kosovo's* telecommunications infrastructure. The KODE Project will achieve its development objective through two main sets of activities: (1) expanding access of Kosovars to high-speed and better quality digital infrastructure and (2) support Kosovars to take advantage of regional and global Digital Economy opportunities, especially for income generation, usage of services, and learning, thus triggering the growth of digital economy in Kosovo*.

The KODE Project will finance the critical fundamentals needed for digital transformation and policy fulfilment. It will provide high speed broadband infrastructure and support access to labour markets, new sources of knowledge, and public services to households and institutions in selected underserved rural areas. At the economy level, the Project will train and connect youth to online employment opportunities and improve access to knowledge sources, including better reaching to and collaboration opportunities with HEIs.

The Project development objectives are to improve access to better quality and high-speed broadband services in project areas and to online knowledge sources, services and labour markets by citizens, and public and academic institutions.

Project benefits are expected to be extended to: (a) inhabitants through access to high-speed broadband internet and the digital awareness initiative; (b) healthcare institutions, and primary and secondary schools. Project benefits at the economy level are expected to be extended to: (c) mobile network operators and their customers through higher-quality mobile services; (d) under/unemployed youth through access to online work programme; (e) students, researchers, and staff of Higher Education Institutions through access to the GÉANT network.

The Project may indirectly benefit other individuals, public institutions, and firms by, for example, integrating product and process innovations of direct Project beneficiaries (e.g. high-speed

broadband users, GÉANT users, etc.) into their own economic activities or leveraging them to generate new innovations, being employed by individuals/firms/public institutions.

Through matching grants scheme, the KODE Project has supported numerous Internet service providers (ISPs) to extend their broadband infrastructure as well as the provision of internet services and television programmes in remote areas of Kosovo*, including many crossing point areas where households did not have the chance to be informed and use digital technologies, and where none of economic operators had interest to invest before. In these areas, which people are leaving each day for various reasons, one of them being the lack of internet access, nowadays it has become a beacon of hope for them not to leave their homes. People living in these areas have openly expressed this recent positive change through their communication with representatives of Ministry of Economy and Environment and the KODE Project.

More than 4,000 households in 147 different villages now have access to high speed broadband internet, and in addition to that, each public institution (schools, healthcare institutions, civil registry offices, etc.), located in these areas are now connected to this infrastructure and will use its services free of charge for 5 years, financed by the KODE Project.

ESSle Project - Enhancing Social Scientific Research in Kosovo* and its integration into the European Research Area

ESSle was an EU-funded project aimed to contribute to enhancement of social science knowledge base in Kosovo* in support of socio-economic development of the economy and its integration into the ERA. The specific objective of the project was to strengthen the social scientific research capacity in Kosovo* by developing human resources and research infrastructure, and facilitating participation in European research programmes. The project duration was from July 2012 to July 2014.

The final beneficiaries of the project were users of the improved capacities, capabilities and knowledge of the target group, which included: (a) research institutions (in particular the UP where the ESSle was operational), (b) students and researchers, (c) public authorities benefiting from an improved scientific evidence-base (e.g. ministries and policies, labour market offices, social service providers), (d) international (scientific) community which will be better informed about the social fabric and developments in Kosovo*.

The target groups were social scientists from public and private sector, academic staff and researchers of the Kosovo* higher education and/or research institutions, researchers and research managers from NGOs and government agencies.

Project partners were:

- ◆ Kosovo* Education Centre (KEC) - Kosovo*, project coordinator,
- ◆ University of Pristina - Institute for Social Studies and Humanities (ISSH) - Kosovo*,
- ◆ University of Vienna (UV) - Austria,
- ◆ Centre for Social Innovation (ZSI) - Austria,
- ◆ Institute for Social Research and Analysis (SORA) - Austria, and
- ◆ Working Life Research Centre (FORBA)-Austria.

The key project results achieved were:

1. A social sciences methods laboratory equipped with 15 PCs; statistical and text analysis programmes established and operated in the ISSH.
2. 35 younger Kosovo* social science researchers working at different research organisations have capacity to understand, apply and exploit state-of-art empirical social-scientific research methods and European databases by participating in research training programme.
3. The capacities of Kosovo* researchers to improve their participation in European research programmes have been increased.

4.4. Research e-Infrastructures

E-infrastructures are the combination of different information and communication resources, tools and services, such as computer networks, systems and scientific databases. Their focus is on a completely new approach to research collaboration and sharing of different resources regardless of the location with the idea to establish a global virtual research community. The development of e-Infrastructure has reached a level that was unthinkable until about twenty years ago. E-infrastructures are crucial when it comes to research, education and innovation, as they enable both networking and advanced IT services, in Kosovo* and beyond.

E-infrastructures are important for fostering open science, supporting the transfer of knowledge and encouraging collaboration across different disciplines and technology domains. Therefore, it is important for Kosovo* to catch up with the latest trend in this regard. The Kosovo* Research and Education Network was created recently and more information on their role is presented in the section below.

4.4.1. Kosovo* Research and Education Network (KREN)

Kosovo* Research and Education Network (KREN) is part of the Department of Post, Telecommunication, Information and Communication Technology of the Ministry of Economy and Environment. It connects higher education and scientific research across Kosovo*, including 18 universities, a data centre and research and education networking site in Prizren.

Established with the support of the World Bank and working with the Ministry of Economy and Environment through the KODE project, KREN aims to improve access to high speed – and better quality – broadband services for students, researchers and educators in Higher Education Institutions.

In December 2020, KREN has been accepted as an associate member of the European network GÉANT, one of the largest and most advanced research and education networks in the world, connecting more than 50 million users in 10,000 institutions in Europe and supporting all scientific disciplines. The request was initiated by the Ministry of Economy and Environment within the KODE Project and it was accepted by the GÉANT General Assembly by a majority vote. This membership brings many benefits to universities and colleges in Kosovo*, where Kosovo* students and professors will now have access to European scientific literature and opportunities for development and research at European level. As an associate, KREN will benefit not only from

access to the pan-European high speed GÉANT network, but from a range of services supporting trust and identity, as well as access to leading cloud services procured on behalf of the GÉANT community.

4.4.2. COBISS.NET

COBISS (Co-operative Online Bibliographic System and Services) is a network that interconnects the bibliographic systems of Western Balkan economies and beyond, and enables the free flow of bibliographic information. It represents an organisational model of joining libraries into a central library information system with shared cataloguing, the COBIB union bibliographic/catalogue database and local bibliographic databases of participating libraries, the COLIB database on libraries, the CONOR authority database, and has a number of other functions. Each economy's library information system built on the COBISS platform is co-created by the economy's COBISS centre and the libraries as members of the system.

Member list of the COBISS.NET platform include the following economies:

- ◆ Slovenia
- ◆ Bosnia and Herzegovina
- ◆ North Macedonia
- ◆ Serbia
- ◆ Montenegro
- ◆ Bulgaria
- ◆ Albania
- ◆ Kosovo*

Unlike other economies whose national libraries participate in the Network, the COBISS system in Kosovo* and Albania are currently being built without their involvement.

By the end of 2020, 7 libraries from Kosovo* were included in the COBISS.KO system, with the possibility of including all other libraries. The table below shows the list of libraries from Kosovo* that are integrated in the COBISS network platform.

No	Name	Homepage	City	Acronym
1	Akademia e Shkencave dhe e Arteve e Kosovës, Prishtinë	www.ashak.org	Prishtinë	BASHAK
2	Biblioteka e Qytetit 'Drita', Kamenicë		Kamenicë	BQK
3	Biblioteka e Qytetit 'Fan S. Noli', Gjilan		Gjilan	BQGJ
4	Biblioteka e UKZ, Gjilan	www.uni-gjilan.net	Gjilan	UPGJ
5	Biblioteka Publike Komunale, Viti		Viti	BPKV
6	Biblioteka Publike 'Ibrahim Rugova', Gjakovë		Gjakovë	BPGA
7	Biblioteka 'Azem Shkreli', Pejë	www.bibliotekaazemshkreli.weebly.com	Pejë	BASHP

Table 1: COBISS.NET: Joined libraries from Kosovo*

Source: <https://ks.cobiss.net>

A close connection between local databases (catalogues) of individual libraries and the shared database (union catalogue) is a characteristic feature of shared cataloguing. Databases contain bibliographic records for different types of library materials (monographs, serials, integrating resources, articles and other component parts).

4.5. Integration into Pan-European Research Infrastructures

Pan-European Research Infrastructures provide an important contribution in taking Europe to the forefront of science, technology and innovation. Their aim is to attract world-class scientists and to provide a substantial support to users allowing them to perform excellent research.

The membership in large European infrastructures is determined by the level of domestic research capacities, achievements, objectives and the expected socio-economic impacts of the membership. Therefore, given the current level of development of research infrastructures in Kosovo*, it is difficult to predict when Kosovo* will have the opportunity to achieve significant membership in the near future. However, as an economy striving to integrate into the European Union, raising the level of research excellence is an important step towards membership in pan-European research infrastructures.

Thus far Kosovo* has participated in one pan-European infrastructure: European Social Survey (ESS).

4.5.1. ESS – European Social Survey

European Social Survey (ESS) has been recognised by the European Commission and the Parliament as one of the key data sources that enables measurement and understanding of the long-term structural changes, and changes of value and cultural patterns and practices of citizens in the European societies. The European Commission regularly uses the ESS data to monitor social phenomena and formulate practical policies at the EU level. The ESS was awarded European Research Infrastructure Consortium (ERIC) status on 30th November 2013.

Majority of the Western Balkan economies participated in at least one round of the ESS. Kosovo* has participated in Round 6 that was conducted in 2012. Kosovo* has not taken the participation in ESS in the next four rounds that were conducted in 2014, 2016, 2018 and 2020.

Kosovo's* active and continuous participation in the ESS is important since ESS, as a member of the European Research Infrastructure Consortium, is one of the internationally recognised research infrastructures in the field of social sciences. ESS follows the latest international standards and, by participating in the ESS, Kosovo* is getting closer to the European Research Area. Furthermore, by participating in two consecutive survey rounds, Kosovo* would provide a stronger basis for understanding the long-term structural changes. Therefore, permanent participation in the ESS needs to be considered. Data gathered via ESS can be used by policy makers when creating certain policies and planning future actions.

WBESS – Western Balkan ESS Regional Network

Western Balkans European Social Survey Regional Network is convened by the Institute for Social Science in Belgrade for promoting the European Social Survey in the Western Balkans. This project is part of the broader Horizon 2020 project – SUSTAIN 2. SUSTAIN 2 is a 36-month project funded by the European Commission, due to be implemented from January 2020 until December 2022.

The focus of the project is on organising workshops, meetings, promotional activities, as well as advocacy towards relevant government ministries. Through appointed National Focal Points the efforts are concentrated on maximising the likelihood that as many economies as possible are granted guest or membership status for ESS Round 10. National Focal Point of Kosovo* is University of Pristina.

5. POLICY RECOMMENDATIONS FOR RESEARCH INFRASTRUCTURES IN KOSOVO*

According to the EU Progress Report (2020)⁴, there is a lack of effort by Kosovo* institutions towards the integration into the European Research Area, which prioritises efforts towards more effective domestic research systems, and trans-economy cooperation including research infrastructure among others. One way for Kosovo* institutions to contribute in this regard is to embark on continuous investments in research infrastructures since investing in research infrastructures contributes to meeting the challenges of the European Research Area and presents a key element and a prerequisite for conducting quality research and innovation.

Despite the fact that development of research infrastructures has been selected as one of the priorities by the National Science Programme of Kosovo* approved more than a decade ago (2010), the lack of research infrastructures is one of the largest barriers to research activities in Kosovo* where integrated scientific research information system does not exist even though it was also planned to be established. Accordingly, there is a pressing need to leverage research infrastructures since there is little or no access to renowned research infrastructure and no institutional support for excellent research.

As a result of the current state of play and in order to improve the quality of research infrastructure in Kosovo*, the following recommendations are put forward:

1. Improve the availability of statistical data in the area of research, technological development and innovation.

Looking into domestic and international statistical data in the area of R&D, it is evident that Kosovo* is facing the challenge of availability of data. Due to the lack of reliable statistics, it is difficult to determine the current state of play in the research sector and to make comparative analyses with regional peers. Open data is globally recognised as a key factor for achieving the United Nations Sustainable Development Goals, as well as for reaching the transformative potential of public policies. Therefore, the availability of data and investment in the concept of open data are the important steps for further development of research infrastructure in Kosovo*.

2. Increase investments in research infrastructures.

According to current state of the development of research sector, it is evident that research is not considered a government priority. This is reflected in the lowest budget designated for research in Europe, amounting to 0.1% of GDP. Moreover, by analysing the total investments in research infrastructures in the previous period, it is evident that there is no clear plan for investing funds in the economy's research infrastructures. Also, investments in research equipment by universities and research institutes are sporadic with no clear strategy. To get closer to other economies in the Western Balkans, it is necessary to allocate more funding to research infrastructures. For this purpose, Kosovo* should consider taking loans from international financial institutions such as the European Investment Bank (EIB), the World Bank (WB) and others. By taking a loan from EIB, Kosovo* should invest in research equipment located at universities and research institutes and thus modernise research equipment.

⁴ European Commission (2020). Kosovo* 2020 Report, Commission staff working document, Brussels, 6.10.2020

Additionally, the Government should allocate sufficient funds for the effective implementation of National Science Programme.

3. **Improve e-infrastructures through enabling further development of KREN and achieving membership of National Library in COBISS Platform**

KREN has been recently established with the support of the World Bank and the Ministry of Economy and Environment in the framework of KODE project. However, in order for the KREN to continue to develop after the project completion, it is important to consider future needs and investment in further development to enable access to high-speed and better quality broadband services for students, researchers and educators in Higher Education Institutions.

The COBISS system in Kosovo* is currently being built without the cooperation of the National Library. The National Library of Kosovo* has been repeatedly invited to participate in the COBISS.net project, but have so far rejected it. However, by the end of 2020, 7 libraries from Kosovo* have been included in the COBISS.KO system. Therefore, the inclusion of the National Library in COBISS system should be considered to make the online bibliographic system more operational and transparent.

4. **Improve the legal and strategic framework for development of research infrastructures**

The term “research infrastructure” is recognised and clearly defined (Article 3) by the current Law on Scientific Research Activities. However, it is desirable to provide a definition of the term “Research Infrastructure Roadmap” that would include clear purpose of the document in order to create a legal basis for the development and adoption of this policy document. All institutions, individuals, infrastructures, equipment and facilities part of scientific and technology development should be subject to information processing and retrieval in the context of designing RI Roadmap: collection of necessary data, creation of databases, data and information security and exchange, analysis and statistical processing.

Article 17 of the Law defines the obligation of the legal research entities, financed by the public budget, to develop a research infrastructure development plan. In accordance with that the Ministry of Education, Science and Technology should initiate the development of a research infrastructure development plan by universities and research institutes in accordance with the Law. Creation of a research infrastructure development plan by research entities would greatly contribute to a more transparent process and opportunities for more efficient management of research infrastructure at the economy level.

The National Science Programme was approved in 2010, however with no updates in the meantime. It is recommended to update the current Strategy or to draft the new one in accordance with the latest developments, trends and new research goals.

5. **Establish a distinct separation between teaching and research**

Generally speaking, Kosovo’s* universities are teaching oriented institutions. Therefore, research is not an organic component of higher education institutions and academic staff daily work. Conducting research is perceived as a periodic activity. To improve this situation, it is recommended to establish a distinct separation between teaching and research.

APPENDIX 1: LIST OF CAPITAL EQUIPMENT AT PURCHASE PRICE HIGHER THAN 50.000 EUR

Institution	No.	Name of research equipment.	Purchase Price (EUR)	Year of Purchase	The source of funds for the purchase of equipment	Estimated Duration of Equipment (yrs.)	Estimated Number of Users
University of Mitrovica "Isa Boletini" (UIBM)	1	Inductively coupled plasma optical emission spectrometry (ICP-OES)	96,000.00	2015	Ministry of Education, Science and Technology	6	0
	2	Makine per provat e terheqjes GALDABINI Quasar 100, +tavolina +Komp.-monitori+kokat dhe mengelet per shtrengim	57,850.00	2014	Ministry of Education, Science and Technology	7	1
	3	CNC X.Mil 900 machine	65,101.50	2006	Ministry of Education, Science and Technology	15	1
	4	Aparati i ashpersise TAYLOR HOBSON	58,889.00	2009	Ministry of Education, Science and Technology	12	1
	5	Makine Tornuese Horizontale Revolver CNC	97,489.00	2019	Ministry of Education, Science and Technology	2	1
University of Pristina "Hasan Prishtina"	6	Equipment for computing system	80,875.20	2011	Own funds	20	95
	7	Atomic absorption spectroscopy (Laboratory at Faculty of Mathematics and Natural Sciences)	67,732.00	2017	Own funds	25	25
	8	Cpt Test - Cone Penetrometer Test (Laboratory at Faculty of Mechanical Engineering)	57,142.02	2019	Own funds	30	35
	9	Robot Baxter (Laboratory at Faculty of Mechanical Engineering)	69,116.65	2019	Own funds	20	30
	10	Maxxmill 630 5	225,978.58	2020	Own funds	20	
	11	Side Universal Milling Centre Siemens 840d S1,12.000					35
	12	Microbiological Identification Susceptibility System Automated (Laboratory at Faculty of Agriculture and Veterinary)	62,000.00	2020	Own funds	25	25

Institution	No.	Name of research equipment.	Purchase Price (EUR)	Year of Purchase	The source of funds for the purchase of equipment	Estimated Duration of Equipment (yrs.)	Estimated Number of Users
University of Pristina "Hasan Prishtina"	13	Resato Water Jet Cutting Installation, ACM 2010-1 (Laboratory at Faculty of Mechanical Engineering)	142,179.92	2020	Own funds	35	20
	14	Robot	55,526.03	2009	Own funds	20	10
	15	Gas Chromatography - Mass Spectrometry from Agilent Technologies (Laboratory at Faculty of Mathematics and Natural Sciences)	79,797.00	2010	Funds from international projects	25	20
	16	Fluorescence, Phase Contrast Microscope (Laboratory at Faculty of Mathematics and Natural Sciences)	55,000.00	2016	Funds from international projects	20	35
	17	Set of equipment of DNA phylogenetic analyses (Q-PCR-HRM, Mill, Centrifuges Electrophoresis, DNA visualisation equipment) (Laboratory at Faculty of Mathematics and Natural Sciences)	53,300.00	2018	Own funds	20	30
	18	Set of equipment for biological-molecular analysis (Deep Freeze -80°C, microbiological Cabinet Class 2, Tissue Lyser, Thermomixer, PCR Cabinet, Thermocycler BIORAD CFX96 RT-PCR Detection System) (Laboratory at Faculty of Agriculture and Veterinary)	63,000.00	2017	Funds from international projects	20	25
	19	Set of equipment for analysis in Biotechnology (Deep Freeze -80°C, Centrifuges, Tissue Lyser, Thermomixer, PCR Cabinet, Thermocycler QIAGEN) (Laboratory at Faculty of Agriculture and Veterinary)	57,800.00	2015	Funds from international projects	20	25

Institution	No.	Name of research equipment.	Purchase Price (EUR)	Year of Purchase	The source of funds for the purchase of equipment	Estimated Duration of Equipment (yrs.)	Estimated Number of Users
University of Pristina "Hasan Prishtina"	20	Set of equipment for biological-molecular analysis (Deep Freeze °C, Sonicator, Homogenizer, Cellometer, Mini Trans-Blot Electrophoretic Transfer Cell, Cavity Rotor, Tetraverticall Electrophoresis Cell, Universal Power Supply, Calibrated Densitometer, Thermoshaker, Minicentrifuge, DNA/RNA Cabinet, Elisa Plate Reader, Nanodrop spectrophotometer, qPCR, Minicentrifuge vortex, Multiplate shaker, UV Cleaner recirculated, Refrigerated Centrifuge, Dry block thermostat	67,000.00	2019	Own funds	20	25
	21	Set of equipment for isolated organ bath (AD Instrument Power Lab 4/30 4 channels, EMKA Technologies DPT, Powerlab 4/35 and TOBS 750, Tissue organ bath EMKA (2018), Surgery, Water Distiller, Surgical Lamp and Table, Rodent Ventilator, Vibratome Line, Microscope MRC SMZ 168, Microscope Motic MLC-150 C. MRC Scientific Instruments, Oxygen Analyser, Blood Gas Analyser	51,000.00	2011	Funds from international projects	years	25
Microbiology Lab, UBT	22	Equipment for Microbiology Lab	60,000.00	2016	Own funds (UBT)	5-10	28
Dental Research Centre, UBT	23	Equipment for Dental Research Centre	143,000.00	2016	Own funds (UBT)	5-10	20
Surgery Lab, UBT	24	Equipment for Surgery Lab	250,000.00	2016	Own funds (UBT)	5-10	8
Gastroenterology Lab, UBT	25	Equipment for Gastroenterology Lab	45,000.00	2016	Own funds (UBT)	5-10	20
Gynaecology Lab, UBT	26	Equipment for Gynaecology Lab	50,000.00	2016	Own funds (UBT)	5-10	12

Institution	No.	Name of research equipment.	Purchase Price (EUR)	Year of Purchase	The source of funds for the purchase of equipment	Estimated Duration of Equipment (yrs.)	Estimated Number of Users
Anaesthesiology Lab, UBT	27	Equipment for Anaesthesiology Lab	120,000.00	2016	Own funds (UBT)	5-10	23
Paediatric Lab, UBT	28	Equipment for Paediatric Lab	70,000.00	2016	Own funds (UBT)	5-10	8
Radiology Lab, UBT	29	Equipment for Radiology Lab	100,000.00	2016	Own funds (UBT)	5-10	26
FAR Analytical Chemistry Lab, UBT	30	Equipment for Analytical Chemistry Lab	200,000.00	2016	Own funds (UBT)	5-10	35
FAR Biology and Genetics Lab, UBT	31	Equipment for Biology and Genetics Lab	120,000.00	2016	Own funds (UBT)	5-10	20
FAR Pharmaceutical Chemistry Lab, UBT	32	Equipment for Pharmaceutical Chemistry Lab	60,000.00	2016	Own funds (UBT)	5-10	12
INI Construction Materials, UBT	33	Equipment for Construction Materials Lab	211,500.00	2013	Own funds (UBT) (71%); Erasmus+ (29%)	5-10	8
MEC Mechatronics Lab, UBT	34	Equipment for Mechatronics Lab	200,000.00	2010	Own funds (UBT)	5-10	8
MEC Intelligent Systems and Robotics, UBT	35	Equipment for Intelligent Systems and Robotics	120,000.00	2010	Own funds (UBT)	5-10	8
MEC Electronics Lab, UBT	36	Equipment for Electronics Lab	50,000.00	2010	Own funds (UBT)	5-10	6
MRC Industrial Production Lab, UBT	37	Equipment for Industrial Production lab	120,000.00	2012	Own funds (UBT)	5-10	6
EE (IE) Energy Lab 1, UBT	38	Equipment for Energy Lab 1	72,600.00	2015	Own funds (UBT) (71%); Erasmus+ (29%)	5-10	8
EE (IE) Energy Lab 2, UBT	39	Equipment for Energy Lab 2	65,000.00	2016	Own funds (UBT)	5-10	8
IS Spatial Data Infrastructure GIS Lab, UBT	40	Equipment for Spatial Data Infrastructure GIS Lab	60,000.00	2016	Own funds (UBT)	5-10	12
IS Cybersecurity and Privacy, UBT	41	Equipment for Cybersecurity and Privacy	70,000.00	2017	Own funds (UBT)	5-10	12
IS Telecommunication Research Lab, UBT	42	Equipment for Telecommunication Research Lab	60,000.00	2016	Own funds (UBT)	5-10	12
IS SAP- Online Research Infrastructure for University Competence Centres, UBT	43	Equipment for SAP- Online Research Infrastructure for University Competence Centres	30,000.00	2017	Own funds (UBT)	5-10	12
Library, UBT	44	Equipment for Library	70,000.00	2007	Own funds (UBT)	5-10	

Institution	No.	Name of research equipment.	Purchase Price (EUR)	Year of Purchase	The source of funds for the purchase of equipment	Estimated Duration of Equipment (yrs.)	Estimated Number of Users
IS 5G Research and Test Lab, UBT	45	Equipment for 5G Research and Test Lab	140,000.00	2020	Own funds (UBT)	5-10	12
IS Software Development Research Centre, UBT	46	Equipment for Software Development Research Centre	60,000.00	2014	Own funds (UBT)	5-10	12
Big Data Research lab, UBT	47	Equipment for Big Data Research lab	70,000.00	2016	Own funds (UBT)	5-10	24
Law Forensic Lab, UBT	48	Equipment for Forensic Lab	55,000.00	2019	Own funds (UBT)	5-10	7
MBE Business Incubator and Business Simulation Lab, UBT	49	Equipment for Business Incubator and Business Simulation Lab	70,000.00	2013	Own funds (UBT)	5-10	6
Political Sciences Opinion Research Lab, UBT	50	Equipment for Opinion Research Lab	50,000.00	2020	Own funds (UBT)	5-10	
CSE Computer Programming Lab, UBT	51	Equipment for Computer Programming Labs	116,940.00	2007	Own funds (UBT) (51%); Erasmus+ (49%)	5-10	15
CSE Software Testing Lab, UBT	52	Equipment for Software Testing Lab	50,000.00	2007	Own funds (UBT)	5-10	15
CSE Networking and Communication Lab, UBT	53	Equipment for Networking and Communication Lab	63,800.00	2008	Own funds (UBT) (79%); Erasmus+ (21%)	5-10	14
Knowledge Centre, UBT	54	Equipment for Knowledge Centre	75,000.00	2015	Own funds (UBT)	5-10	
CSE Internet of Things Lab, UBT	55	Equipment for Internet of Things Lab	60,000.00	2015	Own funds (UBT)	5-10	14
Physiotherapy Lab, UBT	56	Equipment for Physiotherapy lab	70,000.00	2016	Own funds (UBT)	5-10	3
Physiotherapy Lab, UBT	57	Equipment for Physiotherapy Lab					3
Creative and Studio Design Lab, UBT	58	Equipment for Creative and Studio Design Lab	60,000.00	2015	Own funds (UBT)	5-10	6
Textile and Fashion Design Lab, UBT	59	Equipment for Textile and Fashion Design Lab	60,000.00	2015	Own funds (UBT)	5-10	5
Fine Arts, UBT	60	Equipment for Equipment for Fine Arts	50,000.00		Own funds (UBT)	5-10	3
Media Group Lab, UBT	61	Equipment for Media Group Lab	186,700.00	2017	Own funds (UBT) (65%); Erasmus+ 35%)	5-10	
Sport Medicine, UBT	62	Equipment for Sport Medicine	100,000.00	2020	Own funds (UBT)	5-10	3
Clinical Training Lab, UBT	63	Equipment for Clinical Training Lab	120,000.00	2017	Own funds (UBT)	5-10	4
Reanimation Lab, UBT	64	Equipment for Reanimation Lab	70,000.00	2017	Own funds (UBT)	5-10	4

Institution	No.	Name of research equipment.	Purchase Price (EUR)	Year of Purchase	The source of funds for the purchase of equipment	Estimated Duration of Equipment (yrs.)	Estimated Number of Users
ORL Lab, UBT	65	Equipment for ORL Lab	50,000.00	2017	Own funds (UBT)	5-10	2
Cardiology Examination Lab, UBT	66	Equipment for Cardiology Examination Lab	70,000.00	2017	Own funds (UBT)	5-10	2
Dermatovenerology Lab, UBT	67	Equipment for Dermatovenerology Lab	20,000.00	2016	Own funds (UBT)	5-10	
Telemedicine Room Lab, UBT	68	Equipment for Telemedicine Room Lab	50,000.00	2019	Own funds (UBT)	5-10	3
Biomedical Engineering Lab, UBT	69	Equipment for Biomedical Engineering Lab	50,000.00	2018	Own funds (UBT)	5-10	2
Spatial Planning and Urbanism and Environmental Planning-Institute for Urban Studies and Spatial Planning, UBT	70	Equipment for Institute for Urban Studies and Spatial Planning	100,000.00	2019	Own funds (UBT)	5-10	15
Spatial Planning and Urbanism and Environmental Planning-Geo Spatial Data Lab, UBT	71	Equipment for Geo Spatial Data Lab	17,500.00	2016	Erasmus+ (100%)	5-10	6

APPENDIX 2: SURVEY QUESTIONNAIRE

This survey questionnaire contains several sets of questions that serve as an input for the identification and evaluation of research infrastructures potential in Bosnia and Herzegovina. The aim of the questionnaire is to map the research infrastructure as the first and indispensable step in the process of designing the Research Infrastructure (RI) Roadmap.

According to the definition of European Commission, Research Infrastructures (RI) are facilities that provide resources and services for research communities to conduct research and foster innovation. They include:

- ◆ major scientific equipment or sets of instruments;
- ◆ collections, archives or scientific data;
- ◆ computing systems and communication networks;
- ◆ any other research and innovation infrastructure of a unique nature which is open to external users.

Research infrastructures can be centralised, that is, based in a single location. They can also be distributed or virtual, and can form mutually complementary wholes and networks.

Please note that the questionnaire is designed for research centres, laboratories and departments operating within public and private organisations (universities and faculties, public and private research institutes) accredited for research and innovation.

1. General information

1.1. Data about respondent

Full name

Name of your institution

Institution's address

Your position in the institution

Your email address

Institution's website address

1.2. General information about research infrastructure or important research equipment and facilities

1. Name of research infrastructure
2. Host institution
3. Research Infrastructure's address
4. Research infrastructure's website
5. Thematic categorisation of RI by field of science*
6. Type of RI**
7. Main scientific domain
8. Other scientific and technological domains served by RI
9. Total number of RI users
10. Name and position of a person responsible on behalf of research infrastructure:
11. Year of establishment of RI:
12. Founder Institution(s) Ownership Share (%)

*Thematic categorisation of RI types by field of science.

The ESFRI sets the following 6 thematic areas:

1. energy;
2. environment;
3. health and food sciences;
4. physical sciences and engineering
5. social and cultural innovation;
6. e-infrastructures

E-Infrastructure for scientific research—provides computing services for the scientific community.

**Four types of RI are commonly distinguished:

1. single-site facilities;
2. distributed facilities;
3. mobile facilities;
4. virtual facilities

1.3. Description of Research Infrastructure. Please provide basic information and objectives of the research infrastructure

1.4. Please list the services provided to research infrastructure users

2. Data on research equipment

2.1. Estimated value of research equipment

Total estimated value of research capital equipment (in EUR):

purchase value: EUR

current value (amortisation): EUR

2.2. List of capital equipment at purchase price higher than EUR 50.000

	Name of research equipment	Purchase Price (EUR)	Year of Purchase	The source of funds for the purchase of equipment	Estimated Duration of Equipment (yrs.)	Estimated Number of Users
1.						
2.						
3.						
4.						
5.						
6.						
7.						
8.						
9.						
10.						
...						
n						

Please enter only the equipment the purchase value of which is above EUR 50,000.

In the column "The source of funds for the purchase of equipment" please enter the funding source. If there are two or more sources, please indicate each one with the participation share:

- Own funds
- Resources of the Federal Ministry of Education and Science
- Resources of other ministries
- Public funds
- Donations
- Funds from international projects
- Funds / international donations
- Other sources - specify which!

3. Information on access, collaboration and impact

3.1. Information on access

Please provide short description of access policy and procedures for users of this research infrastructure.

3.1.1. Information on external users

Users of RI

Please specify the name of Institution, department

Research groups from your economy

Research groups from Western Balkan economies

Research groups from EU and other countries

3.2. Information on cooperation

Please list the international co-operation agreements and partnerships in which this RI has been involved.

3.2.1. Integration into larger RIs

Is RI connected or integrated into larger RIs (international) or is it a member of any European RI?

Yes

No

If yes, please specify the details:

The name of larger RI:

Membership conditions:

Membership fee, who finances it:

Active

Joined

Additional information:

3.3. Engagement in projects related to research infrastructure development

Have you been engaged in a project aiming at the development of research infrastructure?

Yes

No

If yes, please specify the details:

Title of the project:

Time duration:

Link to web address:

Please add new rows if necessary.

3.4. Plan for the Future

Please describe in detail the plan for the next period, at least for 2-5 years:

Future investments in research equipment:

Is integration into larger research
infrastructures considered:

Other relevant information:

APPENDIX 3: DETAILED INSTRUCTIONS FOR COMPLETING THE SURVEY

The entire process of launching and conducting survey needs to be carried out in broad cooperation with the scientific and research community. The process of surveying need to be complemented with the integration of infrastructure data from other sources i.e. memberships in international research infrastructure organisations, research infrastructures on economy level developed from domestic and EU funds etc.

The text below provides detailed instructions for completing survey questionnaire.

The survey questionnaire consists of 3 sections:

1. General information
2. Data on infrastructure and equipment
3. Information on Access, Collaboration and Networks

The questionnaire should be filled in for one research infrastructure and all data and descriptions should be given for the specific infrastructure that is subject of the questionnaire. Detailed instructions for completing the questionnaire are provided in the text below.

Instructions for completing Part 1: General information: Tables 1.1., 1.2., 1.3., 1.4.

Table 1.1. should include the main information about respondent. The second Table 1.2 refers to the general information about research infrastructure which is the main focus of the questionnaire.

In the field "Thematic categorisation of RI types by field of science", research infrastructure should be grouped thematically. The ESFRI Roadmap 2016 sets the following 6 thematic areas:

1. energy;
2. environment;
3. health and food sciences;
4. physical sciences and engineering
5. social and cultural innovation;
6. e-infrastructures.

Research infrastructures should be linked to one of these defined categories.

In the next field "Type of RI", there are four types of RI that are commonly distinguished:

1. Single-site facilities;
2. distributed facilities;
3. mobile facilities;
4. virtual facilities.

Each research infrastructure should belong to one of these 4 types.

Table 1.3. should provide a detailed description of research infrastructure (general information on research infrastructure) and it's main purpose and objectives.

Table 1.4. should specify and explain specific research services provided to users and external researchers. It is necessary to list the services available to researchers that the research infrastructure offers.

Instructions for completing Table 2.1:

Total value of research equipment used within the research infrastructure should be entered in Table 2.1. It is important to enter two types of values: the purchase value and the current value which takes into account the depreciation of equipment.

Instructions for completing Table 2.2:

Table 2.2 should list only capital research equipment at purchase price higher than EUR 50,000.

Funding sources should be entered in the column "The source of funds for the purchase of equipment" funding source should be entered. If there are two or more funding sources, each one should be indicated with the participation share. One of the following funding sources should be inserted:

- ◆ Own funds
- ◆ Resources of Federal Ministry of Education and Science
- ◆ Resources of other ministries
- ◆ Public funds from Bosnia and Herzegovina
- ◆ Donations
- ◆ Funds from international projects
- ◆ Funds / international donations
- ◆ Other sources - specify which!

Instructions for section 3: Information on Access, Collaboration and Impact

Section 3 consists of 4 open questions and sub-questions and it requires information on access, collaboration and impact of research infrastructure.

Instructions for completing section 3.1.

Short description of access policy and procedures for users of research infrastructure should be provided in section 3.1. If there is no official access policy, please describe internal procedures that are being used. In addition, the estimated number of users of research infrastructure should

be also inserted since that it is very important information for determining the importance of the selected research infrastructure for the research community at the economy and international level. All external organisations and institutions that used research equipment provided by research infrastructure so far should be listed in section 3.1.1.

Instructions for completing section 3.2.

Recognition of research infrastructure and scientific impact on the international level should be emphasised in the sections 3.2 and 3.3 of this questionnaire. This information is of particular interest for determining the relevance of research infrastructure on an international level.

Information on cooperation with other research institutions is important for determining the relevance of research infrastructure as well as the level of interaction with other actors in the research community. In section 3.2, all international research projects, partnerships or agreements that the research infrastructure has been involved in the last 10 years should be listed. Please note that only research projects that included the use of research equipment should be inserted. Information on the potential integration into international or pan-European research infrastructures should be provided, if there is any, in 3.2.1.

Instructions for completing section 3.3.

The section 3.3 refers to the engagement in research projects (H2020, FP7, other programmes) which aimed at establishing research infrastructures on economy or international level.

Instructions for completing section 3.4.

The last section (3.4.) refers to future plan of RI management. The respondent needs to briefly specify the future investment, integration into wider RI and other relevant information as considered important.

good.
better.
regional.



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