



REPORTS ON EU AND EASTERN PARTNERSHIP INTERNATIONAL COOPERATION BAROMETER IN SCIENCE, TECHNOLOGY AND INNOVATION

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List of Abbreviations

EaP PLUS	STI International Cooperation Network for Eastern Partnership				
	Countries - PLUS				
EIT	European Institute of Innovation and Technology				
ERA-NET	European Research Area Network				
ETP	European Technology Platform				
FP7	Seventh Framework Programme for Research and Technological				
	Development				
H2020	Horizon 2020 Framework Programme for Research and				
	Technological Development				
ICT	Information and Communication Technologies				
IncoNet	International Cooperation Network				
IncoNet EaP project	STI International Cooperation Network for the Eastern				
	Partnership Countries				
JPIs	Joint Programming Initiatives				
JTIs	Joint Technology Initiatives				
NCP	National Contact Point				
NGO	Non-Governmental Organization				
SME	Small and Medium-sized Enterprise				
STI	Science, Technology and Innovation				
S&T	Science and Technology				





Executive Summary

The STI cooperation barometer, a tool to measure the 'attitude towards EU-EaP STI cooperation' over time, which was initiated in the IncoNet EaP, was continued in EaP PLUS project to identify long-term trends. One of the activities of the EaP PLUS project is the development of the STI cooperation barometer¹ to provide a knowledge base for evidence-based STI decision-making drawn from analyses and monitoring regarding the state of cooperation between EU and Eastern Partnership (EaP) countries as well as its future potential. It also provides recommendations based on the results from analytical evidence. Online-questionnaires had been sent to around 600 contacts in two rounds under the IncoNet EaP project and the results have been analysed. In this project two more rounds of questionnaires were sent and the responses analysed since it is important to monitor the cooperation over time and observe the trends, which will feed other tasks (e.g. policy dialogue, training and dissemination activities, etc.).

The barometer identifies bottlenecks and trends that will help in defining further actions and strategy to facilitate bi-regional Science, Technology and Innovation cooperation. The result of the barometer gives an overview about the tendencies in STI cooperation with EU and other regions. During the last two years EU was indicated as the most important region concerning science, research and technology cooperation in the case of all EaP countries. The result of the surveys in all four round shows that Germany is the most important country in terms of cooperation. There is a slight increase in popularity of France, Italy, Poland and Russia from 2015. Furthermore, the USA, Romania and Austria are also mentioned as important countries. Cooperation with single European countries (bilateral cooperation), with more European countries in the EU Programmes and with the neighbouring EaP countries showed higher increase in the last two years than cooperation with Russia, the USA, Japan, South Korea, China, India and Turkey. The consideration of the importance of international STI cooperation for EaP countries with the European countries in the next three years increased from 3,8 (in 2016) to 4,6 (in 2019) on a scale where 5 is the maximum. Generally speaking, international cooperation is very significant for all the responding organisations: the level of cooperation with European countries shows increasing tendency.

The number of respondents having experiences in cooperation instruments with EU countries has increased significantly from 2015 to 2019. Having experience with ERA-NETs (from 42% to 63%) shows the highest growth between 2015 and 2019. In 2019, most of the respondents (in 2019 95% of them) were well informed about H2020. Based on the result of 2016, approximately 75% of the respondents have never submitted any proposals under H2020, in 2019 this rate declines to 48%. The fraction of respondents being personally involved in H2020 proposal so far has also increased: in 2015 and 2017: 15%; in 2019: 30%.

¹ The method of the barometer was asking researchers from EaP countries to respond several questions about STI cooperation through online questionnaire in two rounds in EaP PLUS and two rounds in IncoNet EaP project in different years in order to see the changes/development. We used the same questions only with some minor changes in all rounds respecting the aspects of statistics. The second surveys in each project was not implemented for the same pool of respondents since the aim was to reach higher response rate in the second rounds. We did not compare the replies from the same responder directly in the two rounds from statistical point of view.





1. Introduction

The STI barometer was implemented in two rounds in 2015 and in 2016 in IncoNet EaP Project. It was continued in EaP PLUS project to identify long-term trends in two rounds; in 2017 and 2019². It is addressed to stakeholders and researchers with EU-EaP R&D cooperation experience in order to analyse any perceived developments on the ground regarding the development of framework conditions, cooperation opportunities and potentials of bi-regional STI cooperation. The barometer identifies bottlenecks and trends that help in defining further actions and strategy to facilitate bi-regional Science, Technology and Innovation cooperation.

The preparation of the questionnaire by RCISD started in March 2017. The first questionnaire was sent out in March 2017 to more than 600 stakeholders and 257 replies could be analysed. The result of the first questionnaire was delivered in June 2017 as an interim report. The second round of questionnaire was prepared with some minor changes in February 2019. The link for the second survey was sent out to more than 800 stakeholders in March 2019, from that 251 replies could be analysed.

In the second round we not only asked the same pool of targets of the first round, but also sent it out to as many additional contacts as possible, in order to get a higher response rate. So finally, the second round of the questionnaire was sent out to all contacts from the first round and to additional participants who attended events organised by EaP PLUS (like workshops, Grant Scheme, etc.) in the period after the first round. Moreover, those who had subscribed for the EaP Newsletter via the project's website by March 2019 were addressed. Besides, all targets were asked to forward the survey request to their suitable colleagues.

During the analysis all personal data were treated confidentially, and only aggregated results were used by the project. Moreover, all the respondents were informed about other project activities (scientific workshops, financial support schemes for participation in various events etc.) which can be beneficial for their scientific work.

The barometer also contributed to the dissemination of the EaP PLUS project, as after submitting the survey, participants were redirected to the EaP PLUS project website. Besides, the survey asked the participants to add their email address if they wish to subscribe to the EaP PLUS newsletter. 262 new contacts were subscribed thanks to this option.

² The questions of the barometer, the second survey tool that was sent to the EaP scientists in 2019 is detailed in the annex.





2. Methdology

The barometer is purposefully addresses only stakeholders and researchers with EU- EaP research and development cooperation experience in order to analyse any perceived developments on the ground ("sounding board") with regard to framework conditions, cooperation opportunities and potential for bi-regional STI cooperation over time.

The barometer was implemented through two online questionnaires addressed to a minimum of 100 project coordinators and partners in the projects identified in the mapping activity and further actors with EU-EaP cooperation experience in the STI policy, research and innovation communities (e.g. identified through the bibliometric co-publication analysis).

The two surveys were jointly elaborated by the Regional Centre for Information and Scientific Development (RCISD/Hungary) and the Centre for Social Innovation (ZSI/Austria) based on the survey in IncoNet EaP project. The online survey tool was set up and tested by RCISD in March 2017. The first questionnaire was sent out at the end of March 2017 to more than 600 stakeholders and the survey was also published on the EaP PLUS website, social media channels and websites of local partners, etc. The survey was closed in May 2017. The number of the total responses was 413, from that 257 replies could be analysed (the other 156 questionnaires were only partially completed). The second round of questionnaire was prepared with some minor changes in February 2019. The link for the second survey was sent out to more than 800 stakeholders in March; from that 251 questionnaires could be analysed.

The main target group of the task was the scientific community in each Eastern Partnership country, namely Armenia, Azerbaijan, Belarus, Georgia, Moldova and Ukraine.

The results of the two surveys were analysed by the Regional Centre for Information and Scientific Development in April 2019.





3. Results of the STI cooperation barometer

There is no significant difference between the *number of respondents* in the two rounds (251 in 2019, 257 in 2017) which was not the case of the IncoNet EaP project (136 replies in 2015, 570 replies in 2016). In *share of the country respondents* we found a slight difference. For instance, number of replies from Azerbaijan in both round and number of replies from Azerbaijan in 2019, 2019 were quite low that distorts the results.



Figure 1 – Share of responses per countries

The *share of male and female respondents* was well balanced: 53% of the respondents were female in 2019 (44% in 2017). As for the *age division*, there is a considerable amount of young researchers (third of the respondents) up to 39 years in case of both rounds, which shows the interest of these age groups in the future of S&T cooperation.





As regards the *types of organisations*, more than half of the respondents are working at universities and academies of sciences, however only few of them are coming from the business sector.







Figure 3 – Share of responses per type of organisation

Due to a high number of "other" responses, the types of organisations had to be regrouped into broader categories to find connections between other target groups. Instead of seven given types of groups (universities, academies of sciences, state owned research centres, SMEs, private industry, ministries, agencies and funding bodies) we created three larger categories:

- Public research institutions, universities, academies and other state owned research organisations;
- Private research institutions, SMEs and large industry as well as NGOs;
- Public bodies such as ministries, funding bodies, agencies, National Contact Points.

In this way we could cover more stakeholders and identify connections between industryrelated researchers, policy makers and researchers coming from the academia, and other target groups, especially on how far they are interested in various types of international scientific cooperation. As the figures show below the share of different institutions is almost the same in both years. There is a very significant share of academic institutions, universities.

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Figure 4 – Type of organisation – Aggregated organisation types

Based on both rounds of the survey, regarding the *fields of science*, natural sciences, engineering and social sciences are much better represented than agricultural sciences and humanities. Results from the IncoNet EaP surveys from 2015 and 2016 shows that medical and health sciences were better represented that in the two rounds of EaP PLUS (16% of all fields).



Figure 5 – Field of science

Respondents were asked to indicate *how important is the international cooperation for their organisations* on a scale from 1 to 5 (1=not important at all, 5=very important). We observed a continuous growth: the average result was 4.8 in 2019 (4.71 in 2016 and 2017; 4.77 in 2015), so we can assume that, in general, international cooperation is of substantial importance for all the responding organisations.





Respondents were then asked to *name those countries, which had been the most important for their organisation concerning science, research and technology cooperation activities* during the last two years. They indicated all the countries they considered relevant in a free text field. We examined the 8 most important countries that represented in the figures below. Result of the surveys in all the four round shows that Germany appears as the most important country. Result of the IncoNet EaP surveys in 2015 and 2016 showed that the USA was the second most important country, however in 2017 and 2019 it seems to lose importance (the fifth important country) in scientific cooperation activities with the EaP countries. The main reason comes from the higher number of Georgian respondents in IncoNet EaP survey in 2015 and 2016 who have strong relation with USA. There is a slight increase in popularity of France, Italy, Poland and Russia since 2015. Romania and Austria are also mentioned as important countries.



Figure 6 – Most important countries in science research and technology cooperation

We examined the *relation between the most important cooperation countries for each EaP country in the last two years* based on the data from the round of 2019. Romania was mentioned as the most important partner for Moldovan researchers. Italy has a strong relation with Armenia, Georgia and Moldova. Poland is popular among researchers from Belarus, Ukraine and Georgia, which can be explained by their geographic proximity. The USA is the most important country for Georgia and Moldova. In case of Russia, the best relations are with Armenia and Belarus, and this fact was confirmed when respondents were asked about future changes in the scientific cooperation with given countries.

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	Armenia	Azerbaijan	Belarus	Georgia	Moldova	Ukraine	Total
Germany	2,3%	1,5%	3,8%	7,6%	4,8%	6,3%	26,3%
Poland	0,0%	0,0%	3,5%	2,3%	1,5%	5,6%	12,9%
Italy	1,5%	1,0%	1,5%	4,3%	3,5%	0,8%	12,6%
Romania	0,0%	0,0%	0,0%	0,8%	10,1%	1,5%	12,4%
France	1,5%	0,3%	0,5%	4,8%	1,5%	2,8%	11,4%
USA	0,8%	0,5%	0,5%	4,8%	0,3%	3,0%	9,8%
Russia	1,3%	0,5%	4,3%	0,8%	1,5%	0,0%	8,3%
Austria	0,5%	0,5%	0,8%	1,3%	2,0%	1,3%	6,3%

Figure 7 – Most important countries for each EaP country in S&T cooperation

A dedicated question concerns the *importance of various international STI activities* like incoming and outgoing mobility, teaching assignments, hosting and sending young researchers abroad, bilateral and multilateral international cooperation, co-publications, inter-institutional agreements, technology cooperation and market oriented activities, access to large research infrastructure as well as the exchange of science and technology information.

Respondents were asked to choose activities that they consider relevant for their organisations from a list, and rate the relevance on a scale from 1 to 5 (where 1= unimportant and 5=very important) for international research, science and technology cooperation. The general results were compared within last 4 years. Bilateral and international multilateral project collaboration with the EU countries; exchange of S&T Information on strategic level to set up future joint activities were the most important activities in the four rounds (average index above 4.5). Market oriented activities to deploy research results with partners from abroad and teaching assignments are considered as the most unimportant actions. Hosting young researchers is less preferable than sending young researchers abroad, that main reason is that EaP scientists with EaP countries show the highest increase from the year of 2015 to 2019 (increase of the average index is above 15%).







Figure 8 – Relevance of activities in international research, science and technology cooperation

We also examined the *relation between the type of organisations and the activity assessments*, based on data from both rounds³. We assumed that there might be some connection between private ownership and the importance of market oriented research, or public bodies and S&T agreements, etc. Interesting results are shown on the figures below. The results of rating in the second EaP PLUS survey (2019) from private research companies are much lower in 2017 (results from 2015 are closer for 2017), these distortions in data probably derive from low number of participants from this sector in 2019.

Mobility, teaching assignments and sending/hosting young researchers are the most appealing for scientists coming from the public research institutions, academic sciences, and universities

STI International Cooperation Network for

³ The graphs show the mean (using a scale from 0 to 5) of each activity in international research, science and technology cooperation





as it is illustrated in the figure below. Assessment of sending young researchers abroad seems to be more attractive for public bodies in 2019 then in 2017.



Figure 9 – Relation between the type of organisations and the activity assessment – I

Bilateral and multilateral project collaborations show almost the same importance among all institutions. Co-publications are definitely more interesting for scientists coming from the academia than for scientists working in the private sector or those from public bodies. Institutional cooperation resulting in setting of S&T agreements is of higher relevance for public bodies with a significant growth from 2017 to 2019 (0.68), in turn it is hardly interesting for private companies, which is a realistic result.







Figure 10 – Relation between the type of organisations and the activity assessment – II

Technology cooperation received the highest scores from the public bodies (however it has decreased by 0.45 from 2017 to 2019), while the market oriented activities are the most relevant among private research institutions and public bodies. Unlike in the previous cases, private researchers and public bodies are hardly interested in the use of research infrastructures, while it was highly rated by researchers from public research institutions. Although the exchange of S&T Information on strategic level to set up future joint activities seems to be important for all the stakeholder groups, it received the highest scores from the public bodies (with a significant growing from 2018 to 2019 (0.37)). Access to research infrastructure abroad is important for public bodies. We should bear in mind that although all the scores for these activities were high, we can find some differences between the priorities of various types of organisations.

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Figure 11 - Relation between the type of organisations and the activity assessment - III

Respondents were then asked to select from a list the *type of actions in which they had experience with European countries*. Results between 2015 and 2016 and between 2017 and 2019 were very similar, so we compared data between results from 2015 and 2019. The table below shows that experience of respondents increased in case of all actions from 2015 to 2019. Joint research collaboration including mobility, higher education cooperation including mobility and development cooperation are the most typical forms of scientific cooperation in both years. Research policy making in the field of science and research or innovation, cooperation with industry and SMEs are quite low, however the latter action shows the highest increase from 2015 to 2019.







Figure 12 – Experience in actions with European countries

When asking about *how many years they had been working with European countries*, the general finding is that the level of cooperation with European countries is increasing. In 2015, 16% of the respondents were not performing any cooperation with Europe at all, while in the other 3 rounds that number has been continuously reduced; in 2019 it fell to 11%. The number of researchers who have been cooperating with European countries more than 5 years has also increased slightly from 56% (in 2015) to 67% (in 2019), which is a signal of a good cooperation level established between the EaP countries and the EU. On the other hand, the number of researchers who have been cooperating with European countries 1-2 years or 3-5 years is almost stagnant from 2015 to 2019.

The number of respondents having experiences in instruments with EU countries has increased significantly from 2015 to 2019. Having experience with ERA-NETs (from 42% to 63%) and EITs (from 7% to 28%) shows the highest growth between 2015 and 2019. Most of the respondents (in 2019 95% of them) were well informed about H2020 and the majority of them know about ERA-NETs. Much less scientists know about other instruments and initiatives (JPIs, ETP, EIT, JTI).







Figure 13 – Experience in instruments with EU countries

Asking in a separate question "How well are you informed about HORIZON 2020, the EU Framework Programme for Research and Innovation (2014-2020)?" EaP researchers replied on an average score of 3.7 (out of 5) in 2015 and 4,03 in 2019. Evaluation of How well are you informed about calls for proposals launched by HORIZON 2020 is a bit lower as 3,84 is the average score. Based on the result of 2016, approximately 75% of the respondents have never submitted any proposals under H2020, in 2019 this rate declined to 48% that indicates a slight increase in submissions. The number of respondents who have been personally involved so far in HORIZON 2020 proposals has also increased: 2015 and 2017: 15%, 2019 30%. In 2019 78% (2017 81%) of the respondents are planning to submit proposals for calls from Work Programme 2018-2020 of Horizon 2020, although only half of them are already involved in a consortium.

Based on results from the surveys, the five main difficulties identified by the respondents when *preparing and implementing a project* are the following:

- finding a potential partner, identifying partners from EU countries;
- finding a potential project coordinator from EU countries;
- building a consortium;
- poor infrastructure and financial support;
- lack of experience in writing project proposals.

Nevertheless, only a few of the respondents face the following difficulties when preparing and implementing the project: legal rules are incomprehensible and overregulated; unclear conditions of the application and implementation; communication problems between partners.

Based on survey from 2017 and 2019, more than 70% of the respondents have already tried to establish contacts with European researchers to get involved in Horizon 2020 applications. However, the majority of the respondents find it rather difficult (average score of 3 out of 5) to establish these contacts. In most cases they face the following difficulties when trying to establish contacts with European researchers to submit a H2020 proposal together:

lack of personal network (partner search page on the Horizon 2020 website is a help on it, but not sufficient);





- lack of information and links, language barriers;
- finding an appropriate partner with common research interest;
- lack of interest of European researchers in cooperation with EaP researchers (there should be some special measures made to motivate the European researchers to engage EaP countries into projects);
- lack of financing for visiting EU conferences, workshops, more brokerage events and info-days;
- different approaches to solve specific problems;
- significant differences in the use of current technologies;
- low number of publications in international scientific journals;
- no experience in writing proposals, lack of information from potential coordinator from EU countries in the stage of a new project and consortium creation;
- poor infrastructure and financial support, bureaucracy.

Respondents were also asked to indicate which *tools might facilitate their participation in H2020*, selecting from a list of possibilities. Results were almost the same in 2017 and 2019 but quite different between 2015 and 2019. The most positive responses were given for participation in scientific conferences, 69% (67% in 2015) of the respondents find it important in 2019. The importance of the brokerage event tool increased the most significantly from 42% to 55% between 2015 and 2019, resulting that this tool is the second most important in 2019. Project management training also became an increasingly important tool (45% in 2015, 54% in 2019). Partner search support, mobility schemes to visit ad hoc research organisations in other countries to discuss and prepare joint Horizon 2020 proposals are also important instruments, rated above 50%. The language courses were considered to be useful by only 35% of the respondents, and information about IPR received fewer than 20% in 2019.







Figure 14 – Facilitation of tools for participation in H2020 projects

The survey also measured the *development of cooperation of the researcher's country in the last 2 years* with other countries or regions, using a scale from -1 to 1 (where -1=reducing, 1 =increasing and 0=stable). Based on the data from the four years, overall cooperation with single European countries (bilateral cooperation), research cooperation within more European countries in the EU Programmes (such as FP7 or Horizon 2020) and the neighbouring countries (Armenia, Azerbaijan, Belarus, Georgia, Moldova, Ukraine) show the highest increase. Collaboration with Russia constantly decreases. Collaboration with the USA is stable. Bilateral cooperation with single European countries continuously increases (in 2017 33% of the respondents stated that the development is increasing, in 2019 this rate dropped to 44%). The development of research cooperation in the last two years was analysed on the basis of the nationality of the respondents⁴ (especially because of the changes affecting specific countries). Positive tendencies have been observed in Armenia, Belarus, Georgia in terms of bilateral cooperation between 2015 and 2019, however in Azerbaijan Moldova and Ukraine research cooperation with EU countries is stable. EU programmes seem to be attractive for all EaP countries, expect Azerbaijan. Armenia and Belarus which consider their scientific relations with

⁴ The graphs show the number of opinion expressed regarding the importance of research cooperation with countries mentioned in Figure 15 in 2015 and 2019 per EaP countries





Russia significantly increasing. Scientific cooperation with the USA is only increasing in Georgia and Ukraine, while it decreased in Azerbaijan, Belarus and Moldova. Cooperation with China shows significant increase for researchers from Armenia, Belarus, and Ukraine. Intraregional cooperation in general is evaluated in a positive way by all the countries.

































 $\frac{20\%}{0\%} \frac{1}{0\%} \frac{1}{10\%} \frac{1}$

Respondents were asked to indicate 5 EU countries and organisations with which they have the most advanced STI cooperation. It was quite difficult to analyse the most important five EU institutions, as many respondents only mentioned countries instead of institutions. We decided to aggregate the data on country level, and these were then analysed on the basis of the nationality of the respondents. Generally most of the respondents indicated Germany as the most important EU country with whom they have the most advanced STI cooperation. Italy, France, Romania and Poland were also mentioned among the most important 4 EU countries, based on the four surveys.





The UK and Spain in 2017 and 2019 are not as important countries as they were in 2015 (based on result of the IncoNet EaP and EaP PLUS barometer survey). We can observe that Romania is an important partner mainly for Moldovan researchers and Poland is one for Belarusian researchers. Italy, France show close STI cooperation with Georgian researchers. The UK shows not as close STI cooperation with EaP countries in 2019 as in 2015 and 2016. Germany and Poland seems to become a more important partner for Ukraine in 2019.

Most important EU							
countries 2019	Armenia	Azerbaijan	Belarus	Georgia	Moldova	Ukraine	Total
Germany	3,1%	1,1%	5,6%	7,0%	5,0%	6,2%	28,0%
Romania	1,4%	0,6%	1,1%	1,4%	11,8%	1,7%	17,9%
Poland	0,8%	0,6%	3,9%	3,4%	1,4%	5,3%	15,4%
France	1,4%	0,3%	1,7%	5,0%	2,2%	3,6%	14,3%
Italy	2,0%	0,8%	1,4%	4,2%	3,4%	2,5%	14,3%
Austria	0,8%	0,6%	1,1%	3,1%	2,8%	1,7%	10,1%

Figure 16 – Most important EU country in STI cooperation

There was a relatively positive opinion about the *likelihood of the following trends in the next* 3 years in EaP countries:

- Researchers will develop more international cooperation activities;
- Increased use of funding opportunities for international cooperation of researchers;
- Stronger strategic cooperation of my own country with the European Union as a whole;
- Stronger coordination of funding instruments and funding priorities of my own country with European countries;
- More cooperation in applied research, technology development and innovation across borders.

All trends were evaluated as 'most likely', none of them received 'rather unlikely'. The following two trends received the highest evaluation: researchers will develop more international cooperation activities; stronger strategic cooperation of EaP countries with the European Union as a whole.

The *importance of research cooperation between the countries mentioned below and the EaP countries in the next three years* was also evaluated.⁵ Overall, the most important countries are the European countries that received a 4.67 average index in 2017, 4.75 in 2019 and the USA a 3.92 avarage index in 2017, 3.89 in 2019. Cooperation with other EaP countries is almost as important as cooperation with the USA. Japan, China, South Korea and India become more important countries in 2019 than in 2017. Only importance of Russia decreased between 2017 and 2019.

⁵ The Figure 17 shows the mean (using a scale from 1 to 5) of the importance of research cooperation with the countries.







Figure 17 – Importance of research cooperation in the next 3 years

Different countries have different expectations to the various partner countries, so tendencies were also evaluated per EaP countries⁶. General political connections strongly influence the estimations of future S&T cooperation. Overall, the future cooperation with the European countries in the next 3 years shows the strongest increase, all the EaP countries have positive expectations. In case of cooperation with the USA we can see relatively positive expectations from all EaP countries, expect from Belarus with slightly negative estimations. The importance of research cooperation with Russia shows significant fall among researchers from Azerbaijan Georgia and Ukraine. Perspectives for stronger cooperation with Russia are characteristic for Armenia and Belarus. With Japan, India and South Korea, we have a similar picture, there are narrowly positive prospects for all countries, expect of Armenia, Georgia and Ukraine, relatively positive expectations with Japan. China seems to be the most important for Ukraine and Belarus.

 $^{^{6}}$ The graphs show the mean (using a scale from -5 to 5) of the importance of research cooperation with the countries per EaP countries







Figure 18 – Importance of research cooperation in the next 3 years

Respondents were asked to *evaluate the importance of International Science, Technology and Innovation cooperation with the European countries in the next three years* on the scale from 1 to 5 (where 1=minimum and 5=maximum). There is a continuous increase from 2016 to 2019 as the figure below shows and there is hardly any difference in the evaluation of respondents when speaking about the importance of European cooperation for their country, for their institution or for themselves in the same period.



Figure 19 – Importance of International STI cooperation with the European countries in the next 3 years

Finally, respondents were asked to evaluate from 1 to 5 (where 1=not informed and 5=well informed) *how well they are informed about the EaP PLUS project*. It seems that they are well informed about the project from year to year as the average score was 3.01 in 2017 and 3.39 in 2019.





4. Conclusions and recommendation

The results of the STI cooperation barometer between EU-EaP countries contribute to get a deeper picture about the development of framework conditions, cooperation opportunities and potentials of bi-regional STI cooperation over time. It also identified bottlenecks and trends, in order to define further actions and strategies to facilitate bi-regional Science, Technology and Innovation cooperation. The well-balanced share of male and female respondents showed us that there is no evidence of gender distinction among scientists in EaP countries. As for the age distribution, there is a considerable number of young researchers in case of all rounds, which fact shows the interest of this age group in future STI cooperation. However, there is a huge difference in the share of types of institutions: the number of public bodies and private research institutions are low, while more than half of the respondents are working with universities and academies of sciences. Based on both rounds of the survey, regarding the *fields of science*, natural sciences, engineering and social sciences are much better represented than agricultural sciences and humanities. The results from the IncoNet EaP surveys from 2015 and 2016 show that medical and health sciences were better represented that in the surveys of the EaP PLUS project.

4.1. Tendencies in STI cooperation with EU and other regions

EaP countries show even stronger cooperation with the European countries than with other regions, which is justified with the results from several questions of the survey. The barometer observed the tendencies of science, research and technology cooperation during the last two years, as well as the importance of research cooperation in the next 3 years between countries and regions.

During the last two years, the *most important country concerning science, research and technology cooperation* is Germany. Result of the IncoNet EaP surveys in 2015 and 2016 showed the USA as the second most important country, however in 2017 and 2019 it seems to lose importance (becomes the fifth important country) in scientific cooperation activities with the EaP countries; that main reason comes from the higher number of Georgian respondents who have strong relation with the USA according to IncoNet EaP survey. There is a slight increase in popularity of France, Italy, Poland and Russia during the period from 2015 onwards. Romania and Austria are also mentioned as important countries.

EaP countries claimed that *research cooperation between them and other regions* developed the most significant with the European countries - both bilateral cooperation and multilateral cooperation in the EU Programmes such as H2020 - and EaP countries in the last two years. Bilateral cooperation with single European countries is continuously increasing (in 2017 33% of the respondent stated that the development is increasing, in 2019 this rate dropped to 44%). From 2015, collaboration with Russia constantly decreases, collaboration with the USA is stable. Positive tendencies have been observed in Armenia, Belarus, and Georgia in terms of bilateral cooperation with EU countries is stable. Paricipation in EU programmes seem to be appealing for all EaP countries, expect Azerbaijan. Armenia and Belarus consider their scientific relations with Russia positively. Scientific cooperation with the USA is increasing only in Georgia and Ukraine, while it decreased in Azerbaijan, Belarus and Moldova. Cooperation with China shows significant increase for researchers from Armenia, Belarus, and Ukraine, and Ukraine. Intraregional cooperation in general is evaluated in a positive way by all the countries.





The *most important EU country in STI cooperation* seems also to be Germany. Italy, France, Romania and Poland and were also mentioned among the most important 4 EU countries, based on the four surveys. UK and Spain in 2017 and 2019 are not as important countries as in 2015. We can observe that Romania is an important partner mainly for Moldovan researchers and Poland for Belarusian researchers. Italy, France show close STI cooperation with Georgian researchers. The UK shows not as close STI cooperation with EaP countries in 2019 as in 2015 and 2016. Germany and Poland seems to become more important partner for Ukraine in 2019.

Last but not least, the European countries were indicated again as the *most important region in research cooperation in the next three years* by each EaP countries. Russia, the USA, Japan, South Korea, China and India seem to be less important region in research cooperation for EaP countries in the nearest future.

4.2. Trends, bottlenecks actions and tools in STI cooperation

Generally speaking, international cooperation is very significant for all the responding EaP organisations and the level of cooperation with European countries is increasing. The good cooperation level between the EaP countries and the EU can be justified by the fact that the number of researchers who have been cooperating with European countries more than 5 years has increased slightly from 56% (in 2015) to 67% (in 2019). Besides, all EaP countries have a very positive opinion about developing more international cooperation activities and stronger strategic cooperation with the European Union as a whole in the next 3 years. For EaP countries the importance of International STI cooperation with the European countries changed from 3,8 (in 2016) to 4,6 (in 2019) on the scale where 5 is the maximum. The number of respondents having experiences in cooperation instruments with EU countries has increased significantly from 2015 to 2019. Experience with ERA-NETs (from 42% to 63%) and EITs (from 7% to 28%) shows the highest growth between 2015 and 2019. Most of the respondents (in 2019 95% of them) were well informed about H2020 and the majority of them know about ERA-NETs. Much less scientists have knowledge of other instruments and initiatives (JPIs, ETPs, EIT, JTIs).

In the last two years the *most popular activities in international research, science and technology cooperation* are bilateral and international multilateral project collaboration with the EU countries and exchange of S&T Information on strategic level to set up future joint activities. Market oriented activities to deploy research results with partners from abroad and teaching assignments are considered as the most unimportant actions. Hosting young researchers is less preferable than sending young researchers abroad, the main reason is that EaP scientists have more possibilities in networking abroad. Mobility and hosting of scientists coming to EaP countries show the highest increase from the in the period from 2015 to 2019.

The *most popular tools that facilitate the participation* of EaP researchers in H2020 are scientific conferences. The importance of the brokerage events increased the most significantly, as result this tool is the second most important one in 2019. Project management training also became an increasingly important tool from 2015 to 2019. Partner search support, mobility schemes to ad hoc visits to research organisations in other countries to discuss and prepare joint Horizon 2020 proposals are important instruments as well.

International cooperation is very important for all EaP countries; however they have to face many difficulties, among others:





- lack of personal networks (partner search page on the Horizon 2020 website is a help on it, but not sufficient);
- lack of information and links, language barriers;
- finding an appropriate partner with common research interest;
- lack of interest of European researchers in cooperation with EaP researchers (there should be some special measures made to motivate the European researchers to engage EaP countries into projects);
- lack of financing for visiting EU conferences, workshops, brokerage events and infodays;
- different approaches to solve specific problems;
- significant differences in the use of current technologies;
- low number of publications in international scientific journals;
- no experience in writing proposals, lack of information from potential coordinator from EU countries in the stage of a new project and consortium creation;
- poor infrastructure and financial support, bureaucracy.

Based on results from the surveys, the five main difficulties identified by the respondents when preparing and implementing a project are the following:

- finding a potential partner, identifying partners from EU countries;
- finding a potential project coordinator from EU countries;
- building a consortium;
- poor infrastructure and financial support;
- lack of experience in writing project proposals.

4.3. Recommendations

Results from the survey provide recommendations and concrete suggestions on how to better support international STI cooperation in the EaP countries.

- The number of respondents having experiences in tools with EU countries has increased significantly from 2015 to 2019. Almost all of the respondents were well informed about H2020. Knowledge of ERA-NETs shows significant growth from 2015, in 2019 third of the respondents stated that they have experience with this instrument. However, much less scientists know about other instruments and initiatives (JPIs, ETPs, EIT, JTIs). Awareness of these instruments and initiatives should be also spread and shared among researchers from EaP countries.
- National Contact Points (NCPs) have a really important role in intervening between the EU and the EaP institutions. However, numerous researchers from EaP countries are not familiar with their role. Only 34 % of the respondents considered NCPs as useful support that might facilitate their participation in H2020 in 2015. The importance of this supporting structures decreased in 2019 to 32%. NCPs inform about the current calls, programmes and also about the methodology (i.e. how to apply for an EU call). In addition, NCPs facilitate finding the appropriate partners from the EU for collaboration. The importance of the role of NCPs should be also spread and shared among researchers from EaP countries.
- Even if the STI cooperation between the EU MS/AC and the EaP countries is already quite developed, as the data from surveys illustrate, there is a strong interest from both sides in further enhancing the bilateral STI cooperation. Bilateral cooperation networks





or existing collaborations in EaP countries should be used to get access into H2020 consortia. Extending the bilateral cooperations to multilateral ones could also promote stronger cooperation, as well as widen the cooperation with SMEs, academia and industry.

- As it is clear formulated, the Horizon 2020 Policy Support Facility is an instrument that gives Member States and countries associated to Horizon 2020 practical support to design, implement and evaluate reforms that enhance the quality of their research and innovation investments, policies and systems⁷. Although the results are public and the achievements and the efforts are remarkable, it has not reached the visibility of the previous FP7-INCO and H2020-INT projects. Raising awareness and integrating the EaP countries into the European Research Area (ERA) is only possible through further actions with broad involvement of the EaP and EU partners. Targeted coordinating and support actions have the possibility to serve the citizens in the ERA, mobilise scientists, research administrators, innovation managers and policy makers.
- Launching regional oriented project schemes would raise the participation of researchers from the EaP countries in the next framework programme (Horizon Europe). This would also result in an "initial push" that might help to trigger sustainably higher participation rates what is essential if the EU really intends to integrate these countries into the European Research Area.
- Two of the EaP countries are not associated to Horizon 2020. The EU should commence and strengthen the political dialogue with Azerbaijan and Belarus on STI with the objective of more effective participation of these two countries in the EU framework programme.
- The STI system in all EaP countries is continuing to lose many promising young talents that opt to start a career in other sectors of the economy (internal brain drain) or to leave the country (external brain drain). More efforts should be undertaken in order to ensure more attractive and reliable career conditions for young researchers.
- In order to increase visibility, networking is extreme important.. National measures to ease international mobility of students, researchers and innovation actors should be adopted. To support networking, mechanisms (financial tools but information services too) that help researchers and innovators from the EaP countries to participate in information days of the framework programme, in matchmaking events and in international conferences should be strengthen.
- In order to increase the number of the successful H2020 proposals with participation of EaP countries, flexibility is expected from the researchers' side to be able to take part in the proposal submission. Finally, there is a need for more partnering events for EaP countries. Also more SMEs from EaP should be founded through spin-off, more start-up programmes should be available, and workshops on innovation should take place as well.

⁷ <u>https://rio.jrc.ec.europa.eu/en/policy-support-facility</u>





Annexes SURVEY TOOL as of 2019 (last version)

EU - EaP International Cooperation Barometer in Science, Technology and Innovation - 2019

The EaP PLUS project aims to stimulate the cooperation and support the bi-regional Science, Technology and Innovation (STI) dialogue between researchers from the EaP countries (i.e. Armenia, Azerbaijan, Belarus, Georgia, Moldova, and Ukraine) and the EU Member States as well as to enhance the active participation of the EaP countries in the Horizon 2020 Framework Programme.

This questionnaire addresses the six countries of the Eastern Partnership. Following the first three rounds of the questionnarie in 2015, 2016 (under the previous IncoNet EaP project), and in 2017 (under the current EaP PLUS project), the aim of the 4th edition is to continue measuring the development of framework conditions, cooperation opportunities and potentials of the bi-regional STI cooperation.

The survey will take ca. 10 minutes.

Your answers help us to see possible bottlenecks and trends, to define further actions and a strategy to facilitate the bi-regional STI cooperation.

As such, we invite you to participate in the current survey two ways:

- Please answer to the survey;
- Please forward the link of the survey to your own networks interested by the offer.

Any personal data will be dealt confidentially, aggregated results will be solely used by the project and the European Commission for the purpose as defined here. Personal data is being collected and stored by the EaP PLUS project as the data controller and complying with latest data protection standards as defined in the EU's GDPR. All the respondents will be informed about other project activities, which can be beneficial for their scientific work (scientific workshops, financial support schemes for participation in various events etc.). We are pleased to share the results of the survey with any respondents, if indicated at the end of the questionnaire. You can also subscribe to our newsletter at the end of the survey.

Please find more information about the project on the EaP PLUS website. You are also welcome to follow our Facebook and Twitter pages.

We would like to thank you in advance for your time.

Yours sincerely,

The EaP PLUS Team

This project is funded by the Horizon 2020 EU FP for R&I under grant agreement no. 692471

1. I agree to give the right to EaP PLUS project consortium (STI International Cooperation Network for Eastern Partnership Countries – PLUS; GA. number: 692471) to collect and store my e-mail address for the purpose of the Barometer.

2. I understand that the EaP PLUS project stores my e-mail address for 5 years after the end of the project: 2019.08.31. After this period, the e-mail address will be deleted.

3. I understand that I have the right to see what information is stored about me; contact: info@ceriss.eu.

To continue please first accept our survey data policy. 🗏

Next





★ 1. Please choose your country! (Country of permanent residence) Note: This question is compulsory!
Choose one of the following answers
O Armenia
🔿 Azerbaijan
O Belarus
🔘 Georgia
O Moldova
O Ukraine
○ I am from another country

*2. This survey was delivered in 2017. It is repeated now to get comparative data for analysis. Did you participate in the previous round of this survey in 2017? Please write your answer here (Yes/No):

Previous

Previous

Next

Next





Experience with cooperation and backward looking I.

3. Gender
O Choose one of the following answers
O male
O female
4. Age
O Choose one of the following answers
0 20-29
30-39
0 40-49
O 50-59
60-69
○ ≥70
5. For which type of organisation are you working?
Choose one of the following answers
Academy of sciences (institute or centre)
State owned research or technology centre
Private small or medium enterprise (SME) <250 employees
O Private industry (large enterprise, >250 employees)
O Ministry or advisory body (policy making)
O Agency or funding body
O Other:





6. In which fields of science are you active? - (Revised field of science and technology classification of the FRASCATI Manual)
O Choose one of the following answers
O Natural sciences
C Engineering and technology
O Medical and health sciences
Agricultural sciences
O Social sciences
O Humanities
Other:
7. How important is international co-operation for your organisation?
€ 1=not important at all, 5=very important
8. The following countries were most important for me and my organisation concerning science, research and technology cooperation during the last two years:





9. How relevant are the following activities for your organisation in terms of international research, science and technology cooperation? (1=unimportant, 5=very important)

Please choose the appropriate response for each item:

	1	2	3	4	5
Mobility and Exchange of Scientists (outgoing)				0	0
Mobility and Exchange of Scientists (incoming to my country)		0		0	0
Teaching assignments (outgoing)			0	0	0
Teaching assignments (incoming)		0		0	0
Sending young researchers abroad				0	0
Hosting young researchers from abroad	0	0	0	0	0
Bilateral project collaboration (working with one European country)				0	0
International multilateral project collaboration (cooperation with more than one European country)	0	0	0	0	0
Collaboration on international co-publications				0	0
nstitutional cooperation for establishing agreements	0	0	0	0	0
Technology cooperation with commercial potential including a partner from abroad				0	
Market oriented activities to utilize research results with a partner from abroad	0	0	0	0	0
Access to research infrastructure abroad				0	0
Exchange of science and technology information on strategic level to set up future joint activities	0	0	0	0	0





10. My organisation has experience in the following type(s) of action with European countries:				
O Check all that apply				
Joint research collaboration including mobility				
Higher education cooperation including mobility				
Research cooperation with industry or small and medium enterprises				
Policy making in the field of science, research or innovation				
Development cooperation (development assistance)				
No experience yet				
Other:				
11. How well are you informed about calls for proposals launched under bilateral S&T agreements with single European countries?				
0 1 0 2 0 3 0 4 0 5				
1 2 3 4 5 • 1=not informed, 5=very well informed				
1 2 3 4 5 I = not informed, 5=very well informed				
1 2 3 4 5 Image: Instant Street Arrows and Street				
 1 2 3 4 5 1 1 2 3 4 5 9 1=not informed, 5=very well informed 12. How many years does your organisation work with European countries in European cooperation programmes? 9 Choose one of the following answers 				
 1 2 3 4 5 e 1=not informed, 5=very well informed 12. How many years does your organisation work with European countries in European cooperation programmes? e Choose one of the following answers not yet 				
1 2 3 4 5 © 1=not informed, 5=very well informed 12. How many years does your organisation work with European countries in European cooperation programmes? © Choose one of the following answers not yet 1-2 years				
 1 2 3 4 5 e 1=not informed, 5=very well informed 12. How many years does your organisation work with European countries in European cooperation programmes? e Choose one of the following answers not yet 1-2 years 3-5 years 				
 1 2 3 4 5 I=not informed, 5=very well informed 12. How many years does your organisation work with European cooperation programmes? Choose one of the following answers not yet 1-2 years 3-5 years more than 5 years 				

Previous

Next





Experience with cooperation and backward looking II.

13. Do you know about the following European research instruments or platforms? Please choose the appropriate response for each item:						
	Yes	No				
HORIZON 2020, the EU Framework Programme for Research and Innovation (2014-2020)						
ERA-NETs (Supports the coordination of national research programmes accross countries)	0					
JPIs (Joint Programming Initiatives)						
ETP (European Technology Platforms)	0	0				
JTI (Joint Technology Initiatives)						
EIT (European Institute of Technology)	0					





14. How well are you informed about HORIZON 2020, the EU Framework Programme for Research and Innovation (2014-2020)?
0 1 0 2 0 3 0 4 0 5
• 1=not informed, 5=very well informed
15. How well are you informed about calls for proposals launched by HORIZON 2020, the EU Framework Programme for Research and Innovation (2014-2020)?
0 1 0 2 0 3 0 4 0 5
• 1=not informed, 5=very well informed
16. In how many proposals or funded projects have you been personally involved in the 7th Framework Programme for Research and Technological Development (2007-2013)?
• Only numbers may be entered in these fields.
Number of proposals submitted in FP7
Number of funded projects in FP7
17. In how many proposals have you been personally involved so far in HORIZON 2020, the EU Framework Programme for Research and Innovation (2014-2020)?
• Only numbers may be entered in these fields.
Number of proposals submitted in HORIZON 2020
Number of funded projects in HORIZON 2020
18. Are you planning to submit proposals for Work Programme 2018-2020 of Horizon 2020?
Yes No
19. If you plan to submit proposals in Horizon 2020 do you have the consortium?
Yes No





20. My organisation faced the following difficulities when preparing and implementing the project(s):
Check all that apply
Finding a potential partner
Finding a potential project coordinator from EU countries
Identifing partners from EU countries
Lack of personal network with partners
Communication problems between partners
Building a consortium
Lack of experince in writing project proposals
Economic, political problems, legislative system of the country
Poor infrastructure and financial support
Long administration, bureaucracy
Unclear conditions of the application and implementation
Legal rules are incomprehensible and overregulated
Other:
21. Have you ever tried to establish contacts with European researchers to get involved in HORIZON 2020 applications?
Yes No

22. How difficult is it for you to establish contacts with European researchers to get involved in HORIZON 2020 applications?	
○ 1 ○ 2 ○ 3 ○ 4 ○ 5	
● 1=very difficult, 5=very easy	





23. What kind of difficulties did you face when you try to establish contacts with European researchers to get involved in HORIZON 2020 applications?
24 Which tools would facilitate your participation in HORIZON 2020 evolute?
O Check all that apply
Participation in Scientific Conferences
Partner search support
Participation in brokerage events (partnering meetings that allow to present ideas)
Project management trainings
Language courses to improve communication with foreign partners
Twinning" schemes (structural cooperation with a similar organisation in an European country in terms of research agendas, research management, etc.)
Information about calls launched under HORIZON 2020
Participation in information sessions to get informed about HORIZON 2020
Participation in H2020 proposal writing training
A dedicated National Contact Point system informing about funding opportunities in HORIZON 2020
Mobility schemes to visit ad hoc research organisations in other countries to discuss and prepare joint HORIZON 2020 proposals
Information about intellectual property right rules in HORIZON 2020
Other:

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Perception of the importance of cooperation with selected countries

25. How did research cooperation of your country develop in the last 2 years with the following countries or regions? Please choose the appropriate response for each item: Stable Increasing I do not know Not relevant Reducing Research cooperation with single European countries (bilateral cooperation) Research cooperation within more European countries in the EU Programmes (such as FP7 or HORIZON 2020) Research cooperation with Russia Research cooperation with the USA Research cooperation with Japan Research cooperation with South Korea Research cooperation with China Research cooperation with India Research cooperation with Turkey Research cooperation with the neighbouring countries (Armenia, Azerbaijan, Belarus, Georgia, Moldova, Ukraine)

6. Please, indicate 5 EU countries and organisations v	vith whom you have the most advanced STI cooperation!
Country 1	
Country 2	
Country 3	
Country 4	
Country 5	
Example: Spain. Institute of Chemistry, University of M	ladrid





27. What is your opinion for the likelihood of the following trends in the next 3 years in your country:

Please choose the appropriate response for each item:

	Very unlikely	Rather unlikely	Rather likely	Most likely	I do not know
Researchers will develop more international cooperation activities					
Increased use of funding opportunities for international cooperation of researchers	0				
Stronger strategic cooperation of my own country with the European Union as a whole					
Stronger coordination of funding instruments and unding priorities of my own country with European countries	0	0	0	0	0
More cooperation in applied research, technology development and innovation across borders					

28. In your opinion, which countries will be important for research cooperation with your country in the next 3 years? 1=not important, 5=very important

	1	2	3	4	5
Russia					
USA	0				
European Countries					
Japan	0	0	0	0	0
South Korea					
China	0	0	0	0	0
India					
EaP countries	0		0	0	0

O 1=not important, 5=very important

29. In the next 3 years, International Science, Technolo	gy and Innovation co	ooperation with Europe	an countries will be ir	nportant for	
	1	2	3	4	5
My country					
My organisation	0	0			
Me personally					
© 1=not important t, 5=very important					





General Information

0. How well are you informed about the EaP PLUS pro	oject?
) 1 0 2 0 3 0 4 0 5	
) 1=not at all 5=very well	
1. Have you already been contacted and/or invited by	y the projects INCO-NET EaP or EaP PLUS to participate in events or other activities?
~	0
Yes	No
2. If you wish to subscribe to our newsletter please in	ndicate your e-mail address here!
. You are cordially invited to indicate here names an zerbaijan, Belarus, Georgia, Moldova, and Ukraine) s	ıd e-mail contacts (Scientists, STI policy makers) from the 6 Eastern Partnership countries (Armenia, o that we can invite them to take part in this edition of the cooperation barometer survey!
Name	
E-mail	
Name	
E-mail	
Name	
E-mail	
4. Please provide contact details in the text field and	indicate phone number or skype address, e-mail for contacting you!
	s of the survey and have provided my e-mail address above
I would like to receive information about the results	
I would like to receive information about the result	
I would like to receive information about the results	
I would like to receive information about the results Yes	Ø No

Previous

Submit





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