Baltic Science Network

Connecting Through Science

Drivers for Participation in Transnational Research Cooperation, Recommendations for Increasing Participation of Low Performing Countries and Regions in Transnational Research Activities

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Project in brief

Baltic Science Network (BSN) serves as a forum for higher education, science and research cooperation in the Baltic Sea Region (BSR).

BSN is a policy network gathering relevant transnational, national and regional policy actors from the BSR countries. The Network is a springboard for targeted multilateral activities in the frame of research and innovation excellence, mobility of scientists and expanded participation. These joint activities are modelled with an overall aim to ensure that the BSR remains a hub of cutting-edge scientific solutions with the capacity to exploit the region´s full innovation and scientific potential. The activities are modelled as examples of best practice, which form basis of the policy recommendations drafted by the Network.

The platform is tailored to provide advice on how to enhance a macro-regional dimension in higher education, science and research cooperation. Recommendations jointly formulated by the Network members address the European, national and regional policy-making levels.

BSN is a flagship of the EU Strategy for the Baltic Sea Region under the Policy Area Education, Research and Employability, as well as one of two cornerstones of the Science, Research and Innovation Agenda of the Council of the Baltic Sea States.

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Background

The statistics on the 7th Framework Programme for Research and Technological Development (2007 – 2013, FP7) suggests that despite receiving support from European Structural and Investment Funds (ESIF) for developing the economy of the EU Member States, the 'performance' of most of the new Member States (EU-13) falls short of that of the old Member States (EU-15). For instance, EU-15 gained a substantially higher share of funding (85% of the total FP7 budget) than EU-13 (4%)[1]. Therefore, experts have suggested that the reasons for low participation rate and lower financing of EU-13 participants should be analysed further. Moreover, as the ESIF are not designed for networking, additional measures for increasing participation in cooperation projects may be required. In the 8th FP Horizon 2020 (H2020), a set of directly targeted measures have been introduced, however, EU-13 still gets a substantially lower share of funding and the participation of many EU-13 countries is still very low[2].

Although it has been argued to be too early to fully estimate the impact of widening measures yet[3], by now the ratio of funding allocated to EU-13 is increased by 0.2% when compared to the FP7[4]. However, a wider integration of BSR and EU-13 into European Research Area (ERA) has not been achieved[5].

In order to exploit the full innovation and scientific potential of new EU Member States in increasing the competitiveness of EU over other areas of the world, it is important to design additional tools to improve the participation of EU-13 in the FP projects. At the same time, positive discrimination should be avoided and excellence kept the main criterion for supporting cooperation projects. The implementation of new tools nationally, regionally and in the EU is the pre-condition for success.

The BSR is considered a test-bed to develop and implement innovative measures aimed at tackling the participation gap and widening participation in collaborative research and innovation programmes (at EU and regional level), as well as exploiting the region´s full potential. The BSN project has taken the mission of finding solutions for higher education, science and research cooperation in the BSR. To do so, specific actions have been carried out by the support of Interreg Vb Baltic Sea Region Programme resulting in a number of surveys that contribute to making knowledge-based decisions. Among others, one topic of discussions has been enhancing the participation of moderate-performing countries or regions in research

[1] Ex-Post Evaluation of the 7th EU Framework Programme (2007-2013) „Commitment and Coherence" (pages 32-37). Report of the High Level Expert Group. November, 2015. https://ec.europa.eu/research/evaluations/pdf/fp7_final_evaluation_expert_group_report.pdf.

[2] "Study on Research Cooperation in the Baltic Sea Region: Existing Networks, Obstacles and Ways Forward" (pages 20-25). Visionary Analytics. June, 2017. http://www.baltic-science.org/index.php/downloads/public/bsn-publications/169-a5-1-study-on-research-cooperation-full-report.

[3] Baltic Science Network transnational seminar "New Tools for Spreading Excellence and Widening Participation in Research and Innovation Programmes" conclusions. December, 2017. https://www.hm.ee/sites/default/files/new_tools_for_spreading_excellence_and_widening_participation_final.pdf.

[4] Interim Evaluation of H2020 (pages 40 and 88-93). Commission staff working document, 2017. https://ec.europa.eu/research/evaluations/pdf/book_interim_evaluation_horizon_2020.pdf.

[5] "Participation in ERA and Baltic Sea RDI Initiatives and Activities: Analysis and Policy Implications for Widening Participation of Strong and Moderate Innovators" (pages 31-38). Ukrainski, Karo, Kirs, Kanep. June, 2017. http://www.baltic-science.org/index.php/downloads/public/bsn-publications/174-participation-in-era-and-bsr-initiatives-report.

and innovation initiatives in ERA. This can only be achieved in collaboration. This working paper is one input to the widening package of the BSN project and provides suggestions for increasing participation in joint activities of the BSR countries. The recommendations provided are an input for composing national or (macro)-regional action plans that help to set and implement a long-term strategy.

1. Drivers for participation in macro-regional cooperation

In order to describe the drivers for participation in the EU and regional initiatives, the BSR as the primary focus area of the BSN was chosen as a model macro-region. Several actions carried out by the project partners of the Network have looked into the current measures of support, partnerships instruments, barriers for cooperation and possible added value of a macro-regional approach. A summary of the results is provided in the following chapters.

1.1. Current tools of support

Currently, a great proportion of funding for research and development (R&D) comes from external sources. The R&D systems of the EU Member States depend on **external funding** to a different extent. For the EU-13, international funding sources are increasingly important. On average, the EU-13 country group receives 22-24% and the EU-15 country group 11-13% of their R&D funding from abroad. One source of external funding is the FP. The **H2020** contributions are more important for smaller EU Member States, where it is comparable to the total annual funding from abroad (Denmark), or even higher (Estonia). The relative importance of H2020 in international funding is still higher in EU-15 countries. Among moderate innovators, it is very high in Estonia and much lower in Poland, Latvia and Lithuania.[8]

The H2020, acknowledging the necessity of additional assistance to low-performing research, development and innovation (RDI) regions for participating, has introduced the **Spreading Excellence and Widening Participation (SEWP) programme**. The main beneficiaries are countries where the Composite Indicator of Research and Excellence is below 70% of the EU average. The SEWP instruments include Teaming, Twinning and ERA Chairs. Furthermore, SEWP also includes the development of new measures (Policy Support Facility, PSF) and changes in existing instruments such as COST and National Contact Points (NCPs)[6]. Widening instruments have become less relevant for the whole BSR. However, joint programming instruments such as the ERA-NET, have gained importance compared to the period of 2007-2013.[8]

Most SEWP beneficiaries obtain a relatively large share of support from the ESIF, which can also be considered a tool of support designed for structural reforms of national R&I systems and capacity building. However, it has to be kept in mind that the ESIF are not designed for supporting transnational cooperation. In addition, ESIF have been used rather differently in the BSR countries. In Nordic countries, the focus has been on the integration of ERA; in the Baltic

[6] "Study on Research Cooperation in the Baltic Sea Region: Existing Networks, Obstacles and Ways Forward" (pages 14-25). Visionary Analytics. June 2017.

States and Poland, on building the capabilities of national research systems[7]. It has to be kept in mind that ESIF are very important for enhancing the excellence of the macro-region, but are not meant for cross-border cooperation. There is a need to have **common platforms on regional level for supporting cross-border cooperation**. Increasing participation of the new EU Member States in European research cooperation initiatives is also important for innovation leaders, since it would improve the position of Europe as an innovation leader on a global scale. As international cooperation is driven by common benefit and interest, **the BSR countries should set up joint initiatives**. This would add greatly to their global visibility and influence as a world player in the field of research and innovation.[3]

Some larger regional-level initiatives, for example BONUS EEIG (funded from the FP7 based on Article 185) and BSR Stars (integrated with INTERREG Vb Baltic Sea Programme) are also important sources of funding for the region. While instruments connected to the EU Strategy for the Baltic Sea Region (EUSBSR) and BONUS focus on the Baltic Sea as a key object of research cooperation, in other initiatives BSR is rather a place or platform for cooperation (eligible territory) driven less by functional proximity than political and policy imperatives.[8]

The smaller (university) networks, e.g. Baltic University Programme (BUP), are relevant for networking, teaching, mobility of students, but much smaller in financial relevance. They tend to have a narrower thematic focus, and concentrate mainly on cooperation in education and mobility in specific fields, but also organise joint activities.[8]

Domestic R&D funding in the BSR has been increased. The BSR has increased its total R&D funding to almost 37 billion euros in 2014 (11.4% of the total of EU). The growth has been driven by Sweden, Denmark and Germany.[8]

1.2. Principles of partnerships instruments' operation

There is a vast selection of instruments available for partnerships in ERA. The instruments can be divided by the directionality of cooperation (multi- or unidirectional), level of problem-solving (local or transnational) and means for implementing changes (coercion or harmonisation of rules and expectations). The approach taken defines the outcome[9]. An overview of the main instruments and their cooperation logic can be found in Annex table 1.

Overall, three models of RDI policy cooperation can be distinguished – **integration, coordination and decentralised collaboration**. Integration transfers competence from national to higher coordination levels. Coordination supports the formation of long lasting relationships between cooperation partners (horizontal convergence via transnational communication). Collaboration is decentralised, national partners are dominant actors, but the created networks are short-lived.[7]

[7] "Participation in ERA and Baltic Sea RDI Initiatives and Activities: Analysis and Policy Implications for Widening Participation of Strong and Moderate Innovators" (pages 18-22). Ukrainski, Karo, Kirs, Kanep. June, 2017.
[8] "Participation in ERA and Baltic Sea RDI Initiatives and Activities: Analysis and Policy Implications for Widening Participation of Strong and Moderate Innovators" (pages 22-31). Ukrainski, Karo, Kirs, Kanep. June, 2017.
[9] "Can Research, Development, and Innovation Policies Cross Borders? The Case of Nordic-Baltic Region." Tõnurist, P. and R. Kattel. 2016. Science and Public Policy 22, 1-13.

H2020

The integration of EU-13 and EU-15 has not been very successful. **Despite the introduced SEWP measures, most of the beneficiaries are the EU-15 countries: 63.4% of the participants come from the EU-15 countries.** Only 32.3% of the participants are from the EU-13 (secured 47% of the total funds). Moreover, the success rate of the EU-28 countries does not differ significantly between SEWP and H2020 (13.9% and 12.3%, accordingly)[10].

Data from FP participation analysis suggests that:

- Germany, Italy, UK, France, Spain, the Netherlands and Belgium have central roles within networks.[11]
- The Nordic countries (Denmark, Finland and Sweden) cooperate with each other intensively and have important links with the leading Western EU countries. The Nordic countries have been able to develop an **R&I area** supported by transnational governance structures (e.g. NordForsk), such mechanisms are **absent in the BSR macro-region.**[11]
- The Eastern BSR countries are the periphery of the BSR network. The leading Western EU countries are important partners for them, but the reverse is not true. Cooperation with strong innovators in Europe is more common than with other BSR countries. EU-13 researchers often join large H2020 projects covering nearly all of the EU[11].
- National and regional programmes that outline the priorities of the ESIF do not coordinate national investments with the transnational framework.[12]
- Cooperation is mostly project-driven and does not necessarily lead to structured partnerships or long-term joint activities, as cooperation is driven by the partners' attempts to maximise their chances of securing FP funding.[12]

Transnational and regional instruments

Regional cooperation in BSR is largely connected to the EU. Several BSR-focused initiatives do not have a sustainable organisational mechanism in place and rely on external funding sources. The EU-facilitated cooperation favours integration and vertical convergence as a primary organisational mechanism.[7]

Most of the international RDI collaboration of BSR takes place through universities and enterprises, forming the majority of participants in H2020 and BONUS. This suggests that research institutes are not so dominant in the innovation systems of these countries. Companies seek to maximise funding, and collaborate in projects for being informed about new findings that may reveal their advantages to competitors. SMEs seek both finances and tangible results from international projects. Larger companies keep an eye on the technological advancements in ERA projects to stay ahead of the latest developments, but do not have faith in the feasibility of the direct commercialisation of results from such research projects.[15]

[10] "Study on Research Cooperation in the Baltic Sea Region: Existing Networks, Obstacles and Ways Forward" (page 20). Visionary Analytics. June 2017.
[11] "Study on Research Cooperation in the Baltic Sea Region: Existing Networks, Obstacles and Ways Forward" (pages 27-32). Visionary Analytics. June 2017.
[12] "Study on Research Cooperation in the Baltic Sea Region: Existing Networks, Obstacles and Ways Forward" (pages 40-41). Visionary Analytics. June 2017.

Many funding instruments require the inclusion of innovation users in projects. In the moderate-innovator countries the innovation systems are fragmented and innovation users have low capabilities for international cooperation. For FP cooperation networks, SME-s and public sector organisations are found locally, industry actors are often of transnational origin.[15]

1.3. Existing barriers

Several reasons have been suggested for the inability of EU-13 to catch up with the innovation leaders in terms of participation and securing funding. Interviews with researchers from the EU-13[13] suggest that **the lack of contacts, networks and experience** with similar funding schemes are among the most important obstacles to successful participation in the FP. More chances for networking and learning from experiences would help researchers from the EU-13 to develop the capacities for equal participation with the EU-15.

Two distinct approaches for the participation of the EU-13 have been suggested:

- Excellence is the corner stone of FPs. Researchers from all EU Member States should participate **under equal conditions**. However, currently there are too few centres of excellence in the EU to ensure Europe's global competitiveness.
- Widening participation and opening up networks would give a possibility to increase the number of centres of excellence in Europe and contribute to increasing the competitiveness of the region.

Both approaches to overcoming participation obstacles refer to the **Matthew effect**. To counter this dynamic, researchers should "run twice as fast" to catch up with other organisations in the EU-15[14]. The Matthew effect has also been visible in the BSR, where some of the EU-15 countries dominate regional cooperation mechanisms (ERA-NETs, EUSBSR, BONUS), whereas the EU-13 countries remain as underrepresented as in H2020 in general.[15]

The key reasons for low participation of EU-13 in EU funding schemes (FP7, H2020) tend to be structural and the countries **need reforms in RDI activities and capabilities**. The fragmentation of RDI systems in EU-13 hinders the participation of moderate innovators in ERA activities. In addition, some regions need to **increase national funding.** An additional barrier for EU-13 countries is **finding a transnational industrial partner**[15]. There is also limited willingness of funding agencies, industry and public sector to financially support and participate in transnational cooperation initiatives with research institutions.[5]

The barriers for widening participation in research and innovation programmes overlap with cooperation barriers. The latter have previously been determined by the BSN[16]. Researchers claim that the **quality of a proposal** is the main factor behind success and failure. However,

[13] "Assessment of the Impact of the 6th Framework Programme on new Member States" (pages 38-44). May 2009. European Commission.
[14] "Study on Research Cooperation in the Baltic Sea Region: Existing Networks, Obstacles and Ways Forward" (pages 42-58). Visionary Analytics. June 2017.
[15]"Participation in ERA and Baltic Sea RDI Initiatives and Activities: Analysis and Policy Implications for Widening Participation of Strong and Moderate Innovators" (pages 38-48). Ukrainski, Karo, Kirs, Kanep. June 2017.
[16] "Challenges and Barriers to Research Cooperation in the Baltic Sea Region." Danish Agency for Science and Higher Education (2017).

excellent applications are not necessarily excellent in research and innovation activities. **International recognition of the consortium** leader and the experience of the proposal writers are also considered important for the success of applications. It has been suggested that "blind evaluation" would increase the chances of EU-13 to secure funding.[14]

The **lack of staff with necessary skills and experience** in drafting proposals prevents EU-13 in coordinating more projects in H2020. Also, the researchers may rate their excellence and co-operation networks not to be sufficient, and **not have the willingness to invest in the necessary capacities** to improve. Competitive national funding of R&I has been introduced to LV, LT and PL only recently, therefore there may be a lack of skills applying for competitive funding as well. What is more, limited funds within the networks cause an internal competition for the share of funding, where the low prestige of researchers with less experience do not provide equal opportunities in negotiations and EU-13 members become partners instead of coordinators, receiving a smaller share of funding.[14]

Other barriers for entering cooperation projects **are high administrative burden** for coordinators of projects, **lack of transparency**, very **low success rates** and **limited funding for fundamental research**, under-defined national and institutional priorities. In addition, **"bad luck"** has been highlighted as an important factor behind unsuccessful proposals.[14]

A majority of partnerships has evolved from collaborative projects in the past, including those explicitly aimed at building partnerships between the EU-15 and the EU-13. Researchers, who have not yet joined a well-established network, face difficulties in doing so in the future. **Successful consortia are reluctant to expand** because a larger number of partners increases the costs of coordination. Furthermore, some researchers from EU-13 have claimed that they are not **trusted** enough to contribute to specific tasks. Trust also plays a very important role when becoming a coordinator of projects. Well-regarded institutions from the EU-15 are reluctant to join efforts with project coordinators from EE, LV, LT and PL, if there is no prior collaborative experience[17]. The **necessity for increased openness and transparency of R&I partnership landscapes** funded from the FP (e.g. PPP, P2P, EIT-KICs, FET Flagships) was highlighted in the conclusions of the Council of the European Union in December 2017.[18]

An additional barrier for cooperation projects are the **differences in rules for documentation and administration** for the participants, which raises the necessity to follow less strict rules in all participating countries.[15]

1.4. Necessity for a macro-regional approach

Networks of researchers and institutions play a critical role in implementing ERA projects. Usually, **a single institution does not have all of the infrastructure and competences** to carry out ambitious R&I work[17]. Expertise received through international networks is necessary for

[17] "Study on Research Cooperation in the Baltic Sea Region: Existing Networks, Obstacles and Ways Forward" (pages 52-62). Visionary Analytics. June 2017.
[18] General Secretariat of the Council of the European Union. December 2017. http://www.consilium.europa.eu/media/31888/st15320en17.pdf

scientists to avoid insulation in increasingly specialised research fields. Therefore, small countries often try to integrate into a wider range of international cooperation networks, which can compromise the depth of cooperation. While EU-13 has managed to gain more funding from the FPs, this has not increased the integration of these countries within ERA. **The BSR group has even higher isolation compared to the EU-13**, suggesting that the moderate innovators cooperate with other EU-13 members more likely than with other BSR members in H2020. Integration is slightly stronger in the case of smaller and regionally focused programmes (BONUS). The functional proximity* within the BSR is more concentrated in H2020 projects.[5]

The new EU initiatives assume greater functional and relational proximity for governance, joint planning and evaluation of procurement activities. This is difficult for EU-13, as innovation systems are fragmented[5]. **The existence of a region as a geographical location (space) is not sufficient for synergetic transnational cooperation. Such cooperation also needs added value, capabilities, incentives and cultural fit.** When the specific aspects are not in place, physical proximity may result in segregation (or unbalanced integration) within a particular region.[19]

BSR is one of the EU's regions with a strong potential for not only physical, but also functional and relational proximity. If EU and national policy-makers seek to foster regional collaboration in RDI, it would beneficial to establish further transnational cooperation and cross-border synergies. Studies have shown that while policy efforts have grown systemical, there are still important challenges in designing policies that satisfy most regional actors. So far, the diversities of BSR have been overlooked[19]. Therefore, the representatives from universities and business sector do not see BSR partnerships as a plausible strategy for increasing the success rate in the FPs.[15]

The emergence of collaboration initiatives in the BSR on different governance levels (scientist-driven bilateral, regional, EU) has created **a complex system that partly overlaps,** but at the same time **covers only some aspects of the broader macro-region**. Differences in RDI capabilities of different countries may lead to opposing interests regarding RDI cooperation: more developed regions may be interested in building collective critical mass for global competitiveness, less developed regions in intra-regional convergence and catching-up effects.[19]

Common topics should be used as a motivator for cooperation. More institutions should be engaged in solving macro-regional problems. Cooperation should focus on areas of joint excellence and **mutual benefits**. In addition, it is important to select strong and focused thematic areas and put priorities in financing them. A pilot project approach could be used to test this suggestion. Facilitating a two-way flow of people, ideas, good practices and structuring the existing cooperation into sustainable partnerships and networks should also be followed. Instead of creating new systems and platforms, it is suggested to explore the possibilities to enter existing cooperation platforms (such as NordForsk and BONUS) as a macro-region.[3]

[19] "Participation in ERA and Baltic Sea RDI Initiatives and Activities: Analysis and Policy Implications for Widening Participation of Strong and Moderate Innovators" (pages 14-31). Ukrainski, Karo, Kirs, Kanep. June, 2017.

2. New tools and concepts for cooperation

Finding the most suitable approach for widening participation in R&I initiatives requires a careful analysis of measures that have previously proven effective. Success achieved in cooperation programmes has to be highlighted, as it can be a valuable learning example for the EU Member States still struggling with opening up networks or catching up with the leading regions. Analysis reveals shortcomings in policies and helps to make suggestions for improvement. To solve a problem it must be defined first. Thus, both old and novel measures can prove useful in widening participation and decreasing the participation gap.

2.1. Effective participations in EU partnerships

Widening participation in research and innovation programmes in ERA continues to be relevant, because the innovation gap between EU-13 and EU-15 is still significant[3].

Larger macro-regional level programs (BONUS EEIG and BSR Stars) that have proven to be very important for the BSR, have often started as a single project (BONUS ERA-NET and BSR InnoNet). This suggests that the EC strategy to support the alignment of public research efforts by establishing a set of partnering instruments for integration purposes (ERA-NET, Art 185) has been good. The approach is particularly important in the BSR, as it helps to balance the varying financial capabilities among the involved countries.[8]

The continuation of all current H2020 SEWP instruments in the next FP would **ensure the sustainability of current cooperation networks**. Sustainability is vital for future cooperation.[3]

In order to advance cooperation in the BSR, bottom-up and top-down approaches are both important. **Addressing socio-economic challenges needs more top-down coordination and financing**. In all cases, more attention should be paid to functional proximity instead of mere location in the same macro-region. Functional proximity reflects the orientation towards similar focuses in research, for example towards unifying methodology a certain and aiming for a certain end-product. In addition to research and development institutions private and public sector have to be involved in cooperation activities. **Institutions in less developed regions of the BSR should define their specialities and areas of uniqueness to become attractive as partners** for more established researchers. Uniqueness can also be a special geographical location (proximity to the sea for maritime research), collection (databases or libraries), expertise.[3]

Strong innovator countries from the BSR seem to emphasise scientific excellence and priority-setting as most important rationales for research cooperation. In fostering transnational cooperation, areas related to the long-term national R&D competences are in focus. The provision of national grants for "**virtual research centres**" **to support the creation of critical mass** in interdisciplinary research areas as in Denmark (Grand Solutions) or supporting participation in the EU initiatives via cross-sectoral collaboration projects (transnational cluster-to-cluster projects) are considered common practice among several innovator countries.[20]

2.2. Encouraging and inspiring examples

For a successful project, the long-term nature of the cooperation network has to be considered, and much time and effort invested into building trust between partners. Successful projects have a long history, which leads to synergies, new initiatives or applications.[3]

A network based on using infrastructure commonly has proven to be very beneficial. The mobility of researchers to large-scale infrastructures the European Spallation Source (ESS) and MAX IV to cooperate in research projects is the key to building innovative networks[3]. The MAX IV Laboratory provides possibilities to conduct research for example in fragmentation of biomolecules, efficient light sources, medicine and creates opportunities for international cooperation in the BSR and for researchers' mobility. Mobility is a great accelerator of collaboration and including young researchers ensures the sustainability of networks.

Major regional projects play an important role in realizing the BSR-wide cooperation in higher education and research. For example the science-business cooperation project Baltic TRAM (Transnational Access in Macro-Region) also funded by the INTERREG Baltic Sea Region Programme. The BSN provides a macro-regional forum for higher education, research and innovation cooperation. The joint Baltic Sea research and development programme BONUS funded from the EU FP is a great example of joint collaboration in addressing common challenges of the Baltic Sea. There is a need for more similar projects supported from either the EU FP or regional financial instruments such as INTERREG.[3]

Cooperation programmes increase the quality of scientific publications. Bibliometric studies confirm that the scientific quality of peer-reviewed publications from BONUS projects is clearly higher than from non-BONUS research.[3]

H2020 also contributes to increasing the potential of the BSR. For example, the twinning project SEARMET unites Estonia, Denmark and United Kingdom to improve the innovation capacities in the fields of animal reproductive medicine and embryo technology. This has led to an increased knowledge and expertise in reproductive physiology, improved collaboration between the university and farmers and advanced international networking. **The key to success is creating a "win-win" situation for all participants**. The networks created by successful projects should continue collaboration and be considered as future investments.

Effective collaboration projects can arise from the **strategic aim of an organisation to support collaboration in multiple research fields**. For example, NordForsk is a platform for Nordic research and research infrastructure cooperation that fosters cooperation in bio-economy as well as migration and welfare. University of Rostock occupies in several excellent research fields important for the BSR, such as materials in dike construction and understanding wetlands. The Baltic Institute of Finland facilitates networks and development projects in the BSR and offers support services for many organisations in writing applications. **Once an institution has defined its strengths and interests in research, it is possible to find support from institutions that prioritise internationalisation of research.** National actors can meet within a platform

provided in the region and take the first steps towards building a long-lasting collaboration network.

2.3. Known and novel solutions

One of the key preconditions for achieving active, systemic and wide participation in transnational RDI cooperation is stable funding. It is necessary to understand that **welfare in longer term depends on the investments into knowledge-based economy and R&D.**[20]

During the BSN transnational seminar "New Tools for Spreading Excellence and Widening Participation in Research and Innovation Programmes" in Tallinn several key messages from previous experiences were highlighted. These examples should be followed to decrease the innovation gap and increase the competitiveness of Europe and the BSR.[3]

- Encourage companies and R&D institutions to participate in EU's Research and Innovation programmes by **better targeting funding priorities and actions**. Cooperation between universities and enterprises should be advanced. Universities should become more open to collaboration with companies to the point where researchers are allowed to own companies. **Building trust**, especially within the Business-Research-Public Sector (Triple Helix) partnerships is very important.
- Address the gap between research and commercialisation of results in the EU funding programmes. Support both bottom-up and top-down approaches. Offer a full spectrum of support to the companies until they can commercialize their product.
- **Support cross-border cooperation on a macro-regional level**. Implement transnational instruments and exploit EU and regional R&I cooperation platforms and partnerships. Research funding should be more in focus of INTERREG programmes. **A more structured engagement of existing instruments** will maximize effects and increase cooperation at the political level.
- **Brand the uniqueness of the macro-region** or its research institutions to increase its attractiveness as a partner.
- Continue international and cross-sectorial mobility and networking. **Increase the number of networking activities**.
- **Support application writing by joint support platforms** and communicate good practices.
- Increase the functional proximity of cooperation projects. The orientation towards similar focuses is more important than historical and geographical connections.
- **Increase the funding of the EU FPs** to ensure further support for widening initiatives. Focus on alternative funding as well. **Additional funding allocated to enterprises and research and innovation institutions will encourage their participation in the EU FP.**

[20] "Participation in ERA and Baltic Sea RDI Initiatives and Activities: Analysis and Policy Implications for Widening Participation of Strong and Moderate Innovators" (pages 48-67). Ukrainski, Karo, Kirs, Kanep. June, 2017.

Fund excellent projects that have not received EU FP financing (Seal of Excellence certificate). Fund joint PhD training, research and innovation projects, joint infrastructures in the macro-region.[3]

In addition, H2020 analysts have made suggestions to all countries for improving their participation in the FPs[21]. According to the analysis:

- **Specific research areas should be selected for adopting changes**, as not all areas can be addressed simultaneously. A clear national strategic plan is essential, but the timeframe for adopting changes has to be realistic – all changes take time.
- The **harmonisation of ESIF and FP rules** and the alignment of EU and national objectives is needed. It is continuingly important to ensure better synergies between the H2020 (top-down and bottom-up initiatives) and cohesion policy bottom-up initiatives to ensure the competitiveness of EU. Synergies can be developed among various funding sources, for example, they could include agriculture (Common Agricultural Policy).
- Smart specialisation is seen as an opportunity to introduce tailor-made systems for individual countries.
- **A well-working NCP system** is a great support for the applicants; **achievement-based incentive systems** are additional motivators[21].

INTERREG provides additional opportunities for interregional cooperation between innovation ecosystems. One good example of such cooperation is the BSN. However, first, **countries have to concentrate on building their own competence**. Researchers have highlighted that tighter cooperation during the development phase of different instruments helps to prepare for participation and notice possible barriers in advance.[20]

For the BSR in particular, it is important to set long-term goals and to be ambitious, but success is not to be expected very fast. Although sharing best practices can be useful, constant exchange of experiences decreases the necessity for self-invention. However, sharing best practices by increasing researchers' mobility within the BSR should be encouraged and complemented by a cross-sectoral approach. Attracting more researchers from outside the BSR to research institutions should be a priority, as capacity building for excellence, science productivity, efficiency and innovation favour international cooperation. Larger initiatives can be built on the networking and mobility experiences. BSN has been highlighted as one of the best examples of programmes where all actors of the region work together for a macro-regional alignment of resources. The CBSS Science, Research and Innovation Agenda provides an additional platform for further capacity building and advancement of expertise among research institutions in the BSR.[3]

There are broader challenges, which should be addressed on the on macro-regional level (environment, Baltic Sea, natural resources, security, transport infrastructure) and used as a motivator for BSR cooperation. **More institutions should be engaged in solving macro-regional problems**. Cooperation should focus on areas of joint excellence and mutual benefits. It is

[21] Commission Analysis of H2020, September 2011.
http://register.consilium.europa.eu/doc/srv?l=EN&f=ST%2014728%202011%20INIT.

important to **select strong and focused thematic areas and make their financing a priority**. The applicability of the approach can be tested in pilot projects. **Instead of creating new systems and platforms, it is wise to explore as a region the possibilities to enter existing cooperation platforms**, such as NordForsk and FP. The existing successful cooperation initiatives should be continued, if possible. The sustainability and prosperity of the macro-region as well as a safe and secure environment should be top priorities[3].

3. Recommendations for policies

There is a need for efforts in the BSR for overcoming the barriers of participating research and innovation initiatives of ERA and BSR. This can only be achieved if all actors of the region work together for the same purpose. Therefore, multiple changes at all levels of coordination should take place simultaneously in order to facilitate drafting of strategies and action plans. If introduced wisely even small changes can increase the competitiveness of Europe and the BSR.
Two types of transnational RDI cooperation policies are suggested. The "**speeding up**" policies that enhance the emergence of bottom-up initiatives, and "**initiating and steering**" policies that target new types and forms of transnational RDI cooperation. The bottom-up policies tackle common BSR challenges and support the utilisation of R&I infrastructure and mobility further, top-down policies are aimed at solving wider BSR challenges. [22]
The analytical framework of Verdung divides policy instruments into three categories according to their expected impact: regulatory instruments (sticks), economic and financial instruments (carrots) and informative instruments (sermons). Individual instruments used jointly would "nudge" towards increased transnational cooperation.[20]
For widening participation in research and innovation activities and increasing the competitiveness of the BSR, the following measures are suggested[20]:

For the European Commission (EC)[20]:

- As "sticks", EC needs to allow **more bottom-up and innovative initiatives** while supporting the **harmonisation of the rules** and conditions of research funding. The differences between countries should be considered.
- Rationalize the EU R&I funding landscape, increase the **coherence and openness of R&I cooperation networks and partnerships**. First, ensure the transparency of the decision-making process in selecting new partnerships so that less-performing EU Member States could participate in the discussions in equal footing. Second, develop specific measure to **encourage openness of the partnerships and broader participation of EU Member States and newcomers**.
- **Blind evaluation** should be piloted, where possible, as a means to promote openness and eliminate the Matthew effect. Part of the proposal could be evaluated while the identity of the applicant is not revealed.

[22] "Participation in ERA and Baltic Sea RDI Initiatives and Activities: Analysis and Policy Implications for Widening Participation of Strong and Moderate Innovators" (pages 8-12). Ukrainski, Karo, Kirs, Kanep. June, 2017.

- The **introduction of general rules for financial control and documentation in all participating countries**.
- Additional targeted investments as "carrots" to thematic areas with high application rates (increasing the funding for themes heavily applied for and decreasing it for the less popular fields).
- As "sermons", the mix of policy instruments needs to be supported by better and more **systematic information-sharing and communication strategies** targeted to individual agents (researchers, universities, enterprises). EC could publish, update and **project the success rates across instruments** similarly to National Institute of Health in the US. In addition, it has been proposed that the EC should **fund the NCPs** to achieve uniform standards and service provision among the NCPs throughout the EU.
- Develop web-based tools to facilitate partner search from EU-13, e.g. by assembling successful coordinators from EU-13 (for example in the framework of SEWP).
- Consider introducing a short "check-list" to the call to tackle oversubscription and facilitate making application choices for newcomers.

For the BSR[20]:

- As "sticks", **joint research interests need to be identified** and defined in order to represent the macro-region at the level of EU strategy formulation. It is especially relevant to promote joint pre-commercial procurement (PCP) and public procurement of innovation (PPI) funding opportunities on the BSR (in areas with common interest), national, and institutional (university) levels.
- Introducing novel instruments for speeding up bottom-up cooperation for solving BSN challenges would be relevant: prizes; **2nd best funding** (European Research Council, H2020); virtual service centres and shared service centres ("carrots"). Better top-down steering of RDI cooperation could be based on novel instruments - a joint mechanism for funding BSR societal challenges; a joint BSR breakthrough accelerator; the development of common service areas (via IT-solutions), which would support the image of BSR as an innovative region. Career-related standards could be strengthened, a **wider use of peer review and international evaluation** of competitive projects is needed. It is important to **improve drafting skills** related to the preparation of project applications and sharing best practices, training, common use of infrastructure and facilitating cooperation between the institutions in the BSR.
- As "sermons", common ground inside and **common image of the BSR country group** should be communicated through focus-area roadmaps containing timely and systematic information throughout the relevant (national, regional, supra-regional) instruments together with joint promotion and joint representation at the EU level. **Distributing up-to date information on BSR cooperation opportunities** would be profitable in addition to a systemic mapping of strengths and specialisations of the BSR states to support finding the best potential partners in the macro-region. Promoting the

spreading of information and participation culture more generally is suggested. The interests of the macro-region should be promoted.

For individual countries[20]:

- Priority setting as a key "stick", making sure that national legislation, accounting and auditing practices, participation rules and regulations are harmonised to a degree that supports and widens research performers' incentives to take on international projects. **Demonstrating unique capacities** will help to obtain sufficient critical mass in terms of infrastructure, data, and scientific specialisations. **Higher prioritisation** is needed regarding the strategic aims for FP participation or internationalisation more broadly. National and EU policies should be co-ordinated and the shift towards innovation that has occurred in H2020 compared to the FP7 promoted. It is necessary to promote and evaluate institutions based on the higher impact on society and innovation.
- As "carrots", countries could **shift the risks of participating in and especially coordinating** international projects with a wider range of partners from research performers **to the national level**. A support fund should be introduced for the proposals crossing the threshold but failing to receive funding from the EU, as well as "bonuses" for co-ordinating proposals that pass the quality threshold in H2020. It is also important to **secure baseline funding** for relevant groups with potential. There is a need for additional incentives to promote participation at the institutional level. For encouraging the "coordinator" role, it is suggested to create specific top-up funding for the coordination role (national), create/promote support functions (legal advice, finance) for coordination (at the university level).
- As "sermons", countries could audit their support and communication systems and develop **roadmaps connecting national support mechanisms to FP** across specific fields and institution types, keep them easily accessible and updated. In addition, **national NCP systems could be empowered to take on wider training and consultancy activities.** Improvement of information, communication, advice and training services is needed.

For additional information please consult the quoted analyses.

Annex

Table 1 Overview of the main instruments of support cooperation in ERA and BSR[23]

Level of coordination	Main instruments	Key examples	The mode of governance and level of integration
Supra-national	The EU, incl. the ERA	FP7 and H2020	Supranational state model
		PPP Partnerships: JTI	Integration and vertical convergence
		P2P Partnerships: JPI	Coordination
		P2P Partnerships: Art. 185 BONUS and BONUS+	Integration and coordination
		P2P Partnerships: ERA-NETs	Coordination (multi-directional), whereas financial integration has increased
		Widening Participation, e.g. ERA-Chairs, Twinning, Teaming	Collaboration/coordination (strongly unidirectional)
Supra-regional	Macro-regional cooperation in EU	EU Strategy for the BSR - EUSBSR	
		INTERREG	Some level of vertical convergence due to reliance on the ESIF
		EC Smart Specialisation S3 in BSR	
Meta-regional		STRING	Collaboration (multidirectional)
Regional	Inter-governmental cooperation and transnational policy-making networks	Council of the Baltic Sea States (CBSS) & Nordic Council of Ministries (NCM) (incl. NordForsk)	Collaboration/ coordination (multidirectional); horizontal or vertical convergence (depends on the specific cooperation network in question)
	Inter-organisational cooperation and regional networks, incl. bi- and multilateral collaboration programmes	Baltic Sea Region University Network (BSRUN); NOVA University Network, BOVA University Network; Baltic University Programme (BUP)	Collaboration and horizontal convergence (multidirectional)
Regional		E.g. EEA and Norwegian-Estonian Research Cooperation	Collaboration and horizontal convergence (primarily unidirectional)
		E.g. bilateral Estonia-Latvia cross-border cooperation	Collaboration (multidirectional)/coordination (some level of vertical convergence)

[23] "Participation in ERA and Baltic Sea RDI Initiatives and Activities: Analysis and Policy Implications for Widening Participation of Strong and Moderate Innovators" (pages 20-21). Ukrainski, Karo, Kirs, Kanep. June 2017.

Abbreviations

Baltic TRAM	Transnational Access in Macro-Region
BONUS	Baltic Organisations' Network for Funding Science
BSN	Baltic Science Network
BSR	Baltic Sea Region
BUP	Baltic University Programme
COST	European Cooperation in Science and Technology
EC	European Commission
ERA	European Research Area
ERA-NET	European Research Area Network for Funding Agencies
ESIF	European Structural and Investment Funds
EUSBSR	the EU Strategy for the Baltic Sea Region
EU-13	the new Member States
EU-15	old Member States
FP	Framework Programme
FP7	the 7th Framework Programme for Research and Technological Development
H2020	the 8th FP Horizon 2020
InnoNet	Innovation Network
NCPs	National Contact Points
PSF	Policy Support Facility
R&D	research and development
R&I	research and innovation
RDI	research, development and innovation
SEWP	Spreading Excellence and Widening Participation programme

*Functional proximity – the orientation towards similar focuses in research, for example towards unifying processes (methodology) in a region and aiming for the same end-products. Similar institutional and governance structures can contribute to increasing functional proximity.