



# BLACK SEA HORIZON



Bi-regional STI Dialogue

*Report on thematic suggestions for pertinent research topics for further take-up in Horizon 2020 or bi- and multilateral research initiatives targeting the region*

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Abstract	The present report aims to propose pertinent thematic topics on STI cooperation that are of mutual interest for the EU and the Black Sea region, and could serve as an input to future EU Working Programmes and/or other similar bi- and multi- lateral research initiatives.
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**DOCUMENT CONTROL SHEET**


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## **LIST OF ABBREVIATIONS**

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BS – Black Sea

BSH – Black Sea Horizon

EC – European Commission

EU – European Union

GIS – Geographic Information Systems

GMO – Genetically Modified Organisms

RTI – Research, Technology, and Innovation

STI – Science, Technology, and Innovation

WP – Work Package

## EXECUTIVE SUMMARY

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The aim of this Report is to propose challenging thematic topics of mutual interregional interest to serve as an input to the forthcoming H2020 Work Programmes and to the preparation of multilateral calls for proposals (e.g. the envisaged joint call for proposal prepared under WP2 of the Black Sea Horizon project) as well as other bilateral calls for proposals targeting the region. The topics could also contribute to tackling societal challenges.

Thus, building on the region's excellence and existing cooperation patterns and complementary to the societal challenges already treated under the IncoNet EaP project (Climate Change, Energy, Health), three thematic pillars were initially identified *a) sustainable agriculture, b) resource efficiency related to water systems, c) applied chemistry and smart materials* that were further addressed in three international workshops.

Consequently, the pertinent thematic priorities that were produced in the workshops, in combination with additional horizontal issues, will contribute not only to interregional targeted interaction at institutional level, but also to advanced research in academia and entrepreneurship.

## 1. Introduction

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The Black Sea Horizon project is an INCONET type of project funded by the European Commission. It aims to support the EU's external relations with the target region and to stimulate and significantly contribute to bi-regional and regional STI cooperation.

In this regard, WP3 "Support for Joint RTI Activities" aims to increase the collaboration of research communities within the Black Sea region and with other EU Member States, as well as, to contribute to the establishment of supportive framework conditions by identifying challenging thematic areas of common interest, which is one of the main tasks of international coordination and support actions as stipulated in the Horizon 2020 Work Programme.

More specifically, Task 3.1 "Identification of pertinent topics for RTI cooperation" facilitates the identification of thematic priorities of mutual benefit for cooperation, serving as an input to the forthcoming HORIZON 2020 Work Programmes and/or other research programmes and international initiatives.

## 2. Objectives

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The objective of Deliverable 3.1 "*Report on thematic suggestions for pertinent research topics for further take-up in Horizon 2020 or bi- and multilateral research initiatives targeting the region*" is to propose challenging thematic topics of mutual interregional interest to serve as an input to the forthcoming H2020 Work Programmes and to the preparation of multilateral calls for proposals (e.g. the envisaged joint call for proposal prepared under WP2 of the BSH project) as well as other bilateral calls for proposals targeting the region. The topics could also contribute to tackling societal challenges.

The present report could be of use to all interested stakeholders in the field of STI that aim to strengthen EU-BS cooperation; to exploit the region's excellence; to invest in research and innovation, in targeted thematic topics. The target group includes *inter alia* policy making and policy delivery stakeholders, international organisations (EU, BSEC), academia, industry, researchers, NGOs and civil society organisations.

### 3. Methodology

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To achieve its objective, Task 3.1 foresaw the organisation of three thematic workshops in Moscow, Tbilisi and Sofia. Eminent researchers from the EU and the non-EU BS countries took part in the workshops and discussed and identified future research subtopics based on (i) mutual interest, (ii) most relevant challenges, (iii) the excellence available in the region, (iv) the existing cooperation patterns (all evidenced by the co-publication results provided by Task 1.2) and (v) their expert knowledge.

The overall process was coordinated by the WP & Task Leader (ICBSS) in close cooperation with Task Participants HSE (RU), ESIDG (GE) and ARC Fund (BG), who organised and hosted the three workshops respectively, and the Project Coordinator (ZSI).

The Task started with a delay, due to difficulties in identifying the three main topics. According to the Technical Annex, the broad thematic selection had to be complementary to the societal challenges already treated under the IncoNet EaP project (climate change, energy, health), and had to be based on the relevant thematic priorities stipulated by the STI policy dialogue of WP1 of the BSH Project.

To this end, we used bibliographic tools, like SCOPUS, and the research developed under Task 1.2 to identify the three topics that fulfilled the aforementioned criteria, namely (i) mutual interest, (ii) most relevant challenges, (iii) the excellence available in the region, and (iv) the existing cooperation patterns. In particular, the following were identified:

- a) sustainable agriculture,
- b) resource efficiency related to water systems,
- c) applied chemistry and smart materials.

Following the identification of the main thematic pillars, the three workshops were organised as follows:

- i. *Workshop 1. The Future of Agriculture: Grand Challenges and Technological Change, Moscow – 3 March 2016*
- ii. *Workshop 2. Resource Efficiency and Environment - Black Sea Region Challenges, Tbilisi – 22 March 2016*
- iii. *Workshop 3. Applied research in chemistry: Smart materials for a smart future, Sofia – 31 March 2016*

All workshops were organised successfully with the participation of 45 experts mainly academicians and researchers. A balanced representation of the non-EU BS countries and the EU Member States was achieved. Workshop speakers were identified through bibliographical tools and/or proposed by the BSH consortium partners.

Following a different, flexible, yet effective, working pattern for engaging experts in interactive discussions, all three workshops produced valuable scientific results in identifying a plethora of thematic priorities at sectoral and horizontal levels.

In particular, while the workshops in Sofia and Tbilisi were limited to 15-20 experts, the workshop in Moscow allowed for wider participation; approx. 100 participants of various backgrounds attended, including entrepreneurs, policy stakeholders and civil society representatives.

With a view to facilitating discussions and achieving tangible results, speakers were informed in advance about the objective and the purposes of each workshop. To this end, speakers elaborated targeted presentations which included suggestions for subtopics, that later were evaluated in an interactive dialogue among participants. Therefore, each workshop produced a significant number of subtopics. For purposes of time efficiency and best exploitation of the results, it was agreed among participants to group the proposed subtopics thematically. Subsequently, a draft report was communicated to all workshops' speakers for evaluation and adoption.

The final scientific results of the three workshops are included in the present report.

During the workshops, the BSH project was presented to the public and relevant materials were disseminated.

Any challenges that occurred during the implementation of the Task, were dealt effectively by the Task leader, Task participants and the Project Coordinator, with the contribution of all Project Partners.

#### **4. Identification of thematic priorities**

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As mentioned before, the high-level scientific expertise of workshops' participants resulted in diverse scientific results targeting the bi-regional STI research and cooperation, not only at thematic level but also at horizontal level.

#### 4.1. Subtopics for EU – BS RTI Cooperation

Through interactive dialogue and thematic presentations, experts in the workshops have proposed a number of subtopics for further consideration and taking up in future cooperation schemes either under the EU funding tools or at national and/or intraregional level.

The diversity and large number of recommendations from the experts are indicative of the scientific communities' acute interest in enhanced cooperation and continuous research. Scientists and researchers, especially those from the BS countries, expressed their willingness to have access to various funding resources, new technologies and innovative tools that will allow them to evolve and enhance their research.

For purposes of time efficiency and best exploitation, the proposed subtopics were grouped thematically as follows:

##### 4.1.1. *Sustainable Agriculture*

Discussions for “sustainable agriculture” were centred on the following areas: a) towards sustainable agriculture based on new technologies and new institutional designs; b) genetic engineering future prospects; c) food security, new challenges for agricultural countries.

Identification of thematic subtopics:

#### **i. Innovative instruments for sustainable agriculture (foresight, engineering, circular economy)**

During the workshop, experts paid particular attention on innovative instruments to enhance sustainable agriculture and to tackle present and future challenges, such as food security.

It was argued that agriculture is affected negatively by climate change and environmental pollution, and is highly dependent on non-renewable energy sources, while at the same time is often underfunded and in lack of human resources, especially in the BS countries.

According to the experts, a common aspect in BS countries is to develop commercial agriculture based on modern agricultural approaches, while maintaining and facilitating

the development of local agro-biodiversity, including local endemic species and imported varieties.

In this context, experts highlighted a number of various innovative tools that will address the challenges for sustainable agriculture, taking into consideration that world economy and global food supply is highly dependent on agriculture. These innovative tools are:

- **foresight mechanisms:** the role of foresight is essential in acquiring valuable knowledge on not only what will happen, but also what might happen. However, particular attention was given to the necessity of the optimum exploitation of foresight results into research priorities and eventually policies.
- **engineering & nanotechnology:** the development of agriculture in an environmental friendly manner, as well as the use of agricultural products for energy efficiency, aiming to reduce the dependence on non-renewable energy sources and their derivatives while improving the ecological and social conditions of agrarian sectors.
- **circular economy:** an industrial economy that aims at greater productivity while reducing waste and pollution, by design or intention, which if applied on agriculture may result in the following: application of more resource-efficient agricultural practices and regenerative farming practices; closing loops of nutrients and other materials; restoration and preservation of natural capital; developing peri-urban and urban farming; developing digital supply chains.

Legal barriers and lack of funds were mentioned as key threats to the development of new innovative technologies, as well as the lack of regulatory frameworks in the BS countries which fall short in this field compared to the EU.

## ii. **Genetically Modified Organisms (GMO)**

The use of genetic engineering as a means of tackling effectively the challenges of agricultural development was pointed out by experts during the workshop. Particular reference was made to the positive results from the use of transgenic forms (e.g. in trees). Nonetheless, as it was underlined, the use of GMO is still uncharted waters, so it was strongly recommended to proceed with risk assessment and development of strong legal framework.

### iii. Food security

Food security was identified by most of the participants as a key challenge highly interlinked to agricultural development.

Discussions on food scarcity and the quality of nutrition centred on developing proactive mechanisms and evidence-based decisions in order to tackle the challenge effectively and in time, before it becomes a major threat.

Taking into consideration the strong interdependence between food security and agricultural development, experts presented the following solutions for sustainable agriculture and qualitative and quantitative improvement of productivity:

- **agroforestry**: a new model of farming which combines the cultivation of forest, crops and/or breeding livestock in the same area, at the same time. First results show a number of positive effects of combining fields and forests, such as increased carbon sequestration and nutrient use efficiency, minimised leaching, water regulation, water quality and control of soil erosion resulting in an increase of soil fertility.
- **urban agriculture**: urban agriculture is a newly developed sector that aims to ensure food security in large cities. It has to overcome several challenges: poor performance coupled with high demand, environmental pollution, lack of space, high prices of land lease, product certification, difficult access to local markets, lack of food strategies, and legal restrictions.

#### *4.1.2. Resource efficiency related to water systems*

Discussions in the second workshop targeting “resource efficiency related to water systems”, focused on the following thematic areas: a) Riverine systems in the Black Sea Region (ecological status, morphology, human impact, water quality); b) Coastal zones: morphodynamic changes, degradation, stability, technogenesis-related morphodynamic changes in the coastal zones and their impact on the coast stability and coast degradation; c) Material exploitation and ecological impact in the Black Sea Region (water nexus, environmental impact on water bodies and systems).

Identification of thematic subtopics:

### i. Adaptation and mitigation management for natural and human hazards

The BS basin is a highly sensitive region, surrounded by many countries, with significant industrial, fisheries and tourist activity and with significant human intervention. These, together with the special dynamic surface circulation of the Black Sea and the drainage character of the basin in respect to the large number of rivers that flow into it, make the Black Sea vulnerable to various natural and anthropogenic hazards. A plethora of diverse challenges and threats for the BS marine environment and coastline were mentioned, such as construction of power plants on the rivers, removal of the great amount of the sediment from the river beds, artificial shifting of river tributaries, eutrophication, pollution, non-indigenous species, marine litter, oil spills in water rich in hydrogen sulphide, seismic activity, whirlwinds, and many more. In this regard, as it was stressed by many experts, it is necessary not only to identify and monitor the key vulnerabilities; but more importantly, to develop adaptation and mitigation plans to minimise the negative impact in the future. In addition, taking into consideration that all challenges related to water management have transnational character, it was underlined that any national responses should only be supported by intra- and inter- regional approaches if we aim for maximum benefit.

## **ii. Monitoring and harmonisation of data collection**

Experts highlighted the necessity of monitoring and harmonisation of data collection, as critical tools to support successful management scenarios and plans, such as mitigation and adaptation mechanisms. As it was noted by many, research and policy communities in the Black Sea area collect, manage and analyse information on the coastal zone with little or no coordination, using different standards and definitions. Hence, it results in a duplication of efforts and resources, as most of the coastal classifications are locally focused, providing uneven coverage of taxonomic units for the entire Black Sea coastline.

Consequently, the integration of multidisciplinary knowledge and experience will promote the development of a universal Black Sea Basin coastline classification scheme, based on GIS utilities, for a global scale appreciation of coastal zone risks. The adoption of unified criteria and standards will simplify the process of coastal typology and harmonisation of coastal data sets. At the same time, it would be useful to promote the renovation of the targeted research of the coastal processes, as a major

step in terms of both academic research and elaboration of practical recommendations.

### **iii. Sustainable development and blue growth**

Another topic that run through the presentations of experts during the workshop, and was specifically mentioned by policy makers, is the aimed sustainable development of the region, through efficient water resources management.

As it was noted, it is essential to understand the impact of water geo-ecosystems (river mouths, estuaries, lagoons, shelves, etc.) of coastal Black Sea countries on the health of the population, and its manifestation in the socio-economic development of the region. Blue growth is acknowledged by the EU as a long-term strategy to support sustainable growth in the marine and maritime sectors. Noting that seas and oceans are considered drivers for innovation and growth, the Black Sea constitutes a target sea basin that may contribute significantly to evidence-based research and implementation of policies.

#### *4.1.3. Applied chemistry and smart materials*

Discussions for “applied chemistry and smart materials” were developed on the basis of excellence in the respective countries of speakers in combination with excellence and potential of the BS region.

### **i. Smart materials in medicine**

During the workshop, experts stressed the developing studies of smart materials applications in medicine. It was noted that continuous research has produced successful results in medicine (cancer treatment), dermatology (skin cancer chemotherapy, chemo and photo-protection) and cosmetics (photoprotection). Special attention was given to molecular nanomedicine and the growing application of personalised medicine. As it was highlighted, the special climate conditions in South-Eastern Europe and the potential of the countries in the region to develop green materials for health could be considered as a promising bridge to enhance STI cooperation with the European Union.

## ii. **Smart materials for energy efficiency and ecology**

Taking into consideration that energy is highly dependent on fossil fuels which results in rapid consumption of renewable energy sources and ecological damage, experts stressed the significance of smart materials (e.g. carbon catalysts, hybrid membranes, materials for batteries and fuel cells, biomimetic catalysis) for clean energy and environmental monitoring. It was underlined that the efficient use of natural resources provided by the Black Sea region should be enhanced to obtain smart materials, based on soft nanotechnology techniques.

## iii. **From small-scale chemistry to large-scale chemistry**

The significant nexus of research-industry for optimum tangible results was greatly emphasised during the third workshop. Experts strongly argued that research should collaborate more actively with industry in order not only to benefit from industrial infrastructures but more importantly to adapt to market demands. Knowledge transfer from science to industry and vice versa was a key recommendation from all experts.

### 4.2. Horizontal issues

Although the three thematic workshops were addressing different topics, participants in all of them agreed that if we aim for optimum results in scientific research, innovation and cooperation, then we cannot disregard issues that affect all sectors.

Consequently, the following **horizontal issues** were identified:

- **Necessity for interdisciplinary approach:** the apparent sectoral interconnection in STI cannot be left out of any existing or future cooperation patterns, as scientific research and results of one discipline may contribute significantly to the progress of another and/or the technological evolution in one field might be dependent on current research in a different one. For example, the use of GMO in food relates with applied chemistry; food security depends on effective resource management; while medical science has application in all disciplines. Future proposals should not leave this aspect unaddressed.
- **Bridging the business-research gap:** the effective commercialisation of R&D results and the need for more public-private partnerships was strongly emphasised by all experts. The optimum exploitation and internationalisation of

research results and in particular their transformation into innovative products and processes is a key issue for all experts in their efforts to progress their work. Transfer knowledge from science to business and vice versa, was also underlined by experts.

- **Increase of funding opportunities targeting the region:** in relation to the observed potential of the BS region on STI, as well as the need for better commercialisation of research, participants stressed on the importance of providing more funding opportunities targeting the region with regards to research and development. As mentioned, the lack of sufficient funds for research in the BS countries has resulted –among others- in brain drain of young scientists. Public-private partnerships were again mentioned as a means of increasing funding resources for the scientific communities.
- **Increase of coordinated action among the BS countries:** the BS countries have rich, long-lasting and common traditions in STI; while their scientific communities can present notable accomplishments. To this end, experts expressed the desire to take initiative for further synergies, both at national and intraregional level, for mutually beneficial joint actions. As it was noted, it is important to restore the common BS identity and develop regional sustainable plans targeting common issues.
- **Promotion of new technologies and innovation:** all experts stressed the need to invest in new technologies and to promote innovation as a means of achieving better results in research. As it was pointed out, technological progress and its new applications should not pose as a threat but become a useful tool –if used sensibly- to evolve research and scientific results.
- **Gender balance:** women scientists constitute a valuable human resource for the region that remains untapped. Any future cooperation schemes, actions or proposals, should ensure the sustainable development of human resources by promoting gender equality and equal opportunities for all.

## 5. Conclusions

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The overall process of identifying thematic priorities for bi-regional and intraregional STI cooperation has been very interesting and revealed the great potential of the scientific communities for technological progress and innovation.

As mentioned by experts in the three workshops, research and cooperation in science and technology, especially concerning the Black Sea countries, has evolved significantly over the years; nonetheless, there is still room for improvement. Therefore, it was suggested that the identification of the abovementioned pertinent thematic priorities as well as the general recommendations, should be exploited in the best way in order to ensure measurable results in the near future.

Consequently, it was decided after consultations, that the utilisation of the findings will be organised by use of result for the following actions and initiatives:

- Thematic orientation of the grant scheme for brokerage events in T3.3;
- Topics for the joint call in WP2;
- Focus of the Black Sea Cooperation Programme in T1.4 and T1.5 respectively;
- Addressing the thematic directorates of Horizon 2020 through the Project Officer;
- Informing national level stakeholders, such as ministries of STI, sectoral ministries and funding agencies, scientific councils, universities;
- Briefing the Cross border cooperation programme and BS TCP (DG REGIO and DG NEAR);
- Addressing BSEC Organisation, and in particular the Working Group on Cooperation in Science and Technology;
- Reporting to the EaP Panel on R&I organised by the EC.

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## ANNEXES

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Annex A. [Agenda of Workshop 1, Moscow, 3.3.2016](#)

### **Black Sea Horizon International Workshop**

### **The Future of Agriculture: Grand Challenges and Technological Change**

**Identifying Perspective Areas of S&T Cooperation between the European Union and the Black Sea Region in Sustainable Agriculture**

**Moscow, March 3, 2016**

**Venue:** Higher School of Economics (HSE), Moscow, 9/11, Myasnitskaya str., room 518

### **Agenda**

<b>9.30 – 10.00</b>	<b>Registration and coffee</b>
<b>10.00 - 10.30</b>	<p><b>Welcome &amp; introduction to the workshop</b></p> <p><i><b>Elena Astrakhantseva</b>, Deputy Minister of Agriculture of the Russian Federation</i></p> <p><i><b>Leonid Gokhberg</b>, First Vice-Rector of National Research University Higher School of Economics, Director of the Institute for Statistical Studies and Economics of Knowledge HSE (Russia)</i></p> <p><i><b>Richard Burger</b>, Head of Science and Technology Section, Delegation of the European Union to the Russian Federation</i></p>
<p><b>Session 1: Prospects of agriculture development</b></p> <p><b>Chair: Leonid Gokhberg</b>, First Vice-Rector of National Research University Higher School of Economics, Director of the Institute for Statistical Studies and Economics of Knowledge HSE (Russia)</p>	
<b>10.30 – 10.50</b>	<p><b>Global challenges and opportunities in agriculture and food industry</b></p> <p><i><b>Ozcan Saritas</b> (Laboratory for Science and Technology Studies, International Research and Educational Foresight Centre, Institute for Statistical Studies and Economics of Knowledge HSE, Russia)</i></p>
<b>10.50 – 11.10</b>	<p><b>S&amp;T foresight for agriculture</b></p> <p><i><b>Alexander Chulok</b> (Department of Science and Technology Foresight, International Research and Educational Foresight Centre, Institute for Statistical Studies and Economics of Knowledge HSE, Russia)</i></p>
<b>11.10 – 11.30</b>	<b>Promising areas of agricultural S&amp;T development</b>

	<i>Ilya Kuzminov (Department of Science and Technology Foresight, International Research and Educational Foresight Centre, Institute for Statistical Studies and Economics of Knowledge HSE, Russia)</i>
<b>11.30 – 11.50</b>	<b>Connecting food industry with agriculture based on the principle of circular economy</b>  <i>Anca Ioana Nicolau (Food Microbiology Laboratory, Faculty of Food Science and Engineering, Dunarea de Jos University of Galati, Romania)</i>
<b>11.50 - 12.20</b>	<b>Coffee Break</b>
<b>Session 2: Prospects of S&amp;T international cooperation between the EU and the Black Sea region countries in the field of agriculture</b>  <b>Chair: Vladimir Volik, Deputy Director of the Department for Agricultural Market Regulation, Fishery, Food and Processing Industry, Ministry of Agriculture of the Russian Federation</b>	
<b>12.20 – 12.40</b>	<b>Perspectives of international cooperation in the field of agriculture and potential areas for joint projects</b>  <i>Alexei Nistean, Executive Manager of the Permanent International Secretariat of the Organization of the Black Sea Economic Cooperation (BSEC PERMIS)</i>
<b>12.40 – 13.00</b>	<b>Black Sea Horizon project: identifying priorities for S&amp;T cooperation between the EU and the Black Sea region countries</b>  <i>Georgia Chantzi (International Centre for Black Sea Studies, Greece)</i>
<b>13.00 – 13.20</b>	<b>Subprogramme “Food security and sustainable agriculture” in the EU Framework Programme for Research and Innovation “Horizon 2020”</b>  <i>Alena Lavrova (Horizon 2020 NCP “Biotechnology”, Federal Research Centre «Fundamentals of Biotechnology», Russian Academy of Sciences)</i>
<b>13.20 – 14.20</b>	<b>Lunch</b>
<b>Session 3: Towards sustainable agriculture based on new technologies and new institutional designs</b>  <b>Chair: Georgia Chantzi, Research Fellow of International Centre for Black Sea Studies (Greece)</b>	
<b>14.20 – 14.40</b>	<b>Biotechnology improvement and international collaboration to foster the development of Bulgaria’s livestock breeding</b>  <i>Elena Kistanova (Department “Embryo Biotechnologies in Animals”, Institute of Biology and Immunology of Reproduction, Bulgarian Academy of Sciences)</i>
<b>14.40 – 15.00</b>	<b>Agroecological principles for sustainable agriculture</b>

	<b>Boris Boincean</b> ( <i>Department of Sustainable Farming Systems, Research Institute of Field Crops "Selectia", Balti, Republic of Moldova</i> )
15.00 – 15.20	<b>The knowledge-based bioeconomy as a driver of sustainable internationally competitive agricultural sphere of Ukraine</b>  <b>Olga Kot</b> ( <i>Dobrov Centre for S&amp;T Potential and Science History Studies, National Academy of Sciences of Ukraine</i> )
15.20 – 15.40	<b>Research and inclusion in international research topics of Georgia's germplasm resources</b>  <b>Giorgi Badrishvili</b> ( <i>Scientific Research Center of Agriculture, Georgia</i> )
15.40 – 16.00	<b>Agrochemical characteristics and ways of efficient utilization of bio-residues separated in the process of obtaining biogas from poultry droppings</b>  <b>Silva Atoyán</b> ( <i>Institute of Botany, National Academy of Sciences of the Republic of Armenia</i> )
16.00 – 16.30	<b>Coffee break</b>
<b>Session 4: Genetic engineering: future prospects for international cooperation</b>  <b>Chair: Alexei Nistrean</b> , <i>Executive Manager of the Permanent International Secretariat of the Organization of the Black Sea Economic Cooperation (BSEC PERMIS)</i>	
16.30 – 16.50	<b>The prospects and reality of GM crops in Russia</b>  <b>Sergey Zavriev, Konstantin Shestibratov</b> ( <i>Shemyakin &amp; Ovchinnikov Institute of Bioorganic Chemistry, Russian Academy of Sciences</i> )
16.50 – 17.10	<b>Molecular mutagenesis, by genome editing</b>  <b>Ervin Balázs</b> ( <i>Department of Applied Genomics, Agricultural Institute, Centre for Agricultural Research, Hungarian Academy of Sciences</i> )
<b>Session 5: Food security: new challenges for agricultural countries</b>  <b>Chair: Dmitry Korotkov</b> , <i>Head of Division of Basic Research and S&amp;T Complex Development, Department of Science and Technologies, Ministry of Education and Science of the Russian Federation</i>	
17.10 – 17.30	<b>The potential role of agroforestry in tackling food security and bioenergy</b>  <b>Dirk Freese</b> ( <i>Department of Soil Protection and Recultivation, Brandenburg University of Technology Cottbus, Germany</i> )
17.30 – 17.50	<b>Prospective role of local food supply and urban agriculture in providing food security of large cities</b>  <b>Anna Augustyn</b> ( <i>Independent network and think tank on European agricultural and rural development policies "Groupe de Bruges", Poland</i> )

**Wrap-up and next steps**

**Chair: Elena Metelkova**, *Director of the Department of S&T Policy and Education, Ministry of Agriculture of the Russian Federation*

**17.50 – 18.15**

**Prospective areas for S&T cooperation between the EU and the Black Sea region in sustainable agriculture**

**Georgia Chantzi** (*International Centre for Black Sea Studies, Greece*)

**Leonid Gokhberg** (*National Research University Higher School of Economics, Russia*)

Annex B. Agenda of Workshop 2, Tbilisi, 22.3.2016

## Black Sea Horizon International Workshop

### The Resource Efficiency and Environment - Black Sea Region Challenges

Identifying Perspective Areas of S&T Cooperation between the European Union and the Black Sea Region in Resource Efficiency and Environment (related to water systems)

Tbilisi, 22 March 2016

Venue: Hotel Kalasi, Conference hall

### Agenda

9.30 – 10.00	Registration
10.00 - 10.20	<p><b>Welcome &amp; Introduction to the Workshop</b></p> <p><i>Parliament of Georgia – Temur Maisuradze, Chairman of Innovation Council of the Georgian Parliament, Member of Parliament</i></p> <p><i>Ministry of Education and Science of Georgia – Tamaz Marsagishvili, Deputy Minister</i></p>
10.20 – 10.40	<p><b>Presentation of Black Sea Horizon project: identifying priorities for S&amp;T cooperation between the EU and the Black Sea region countries</b></p> <p><i>Georgia Chantzi, Research Fellow, International Centre for Black Sea Studies (ICBSS, Greece)</i></p>
10.40 – 11.00	<p><b>Presentation of DANUBIUS Project</b></p> <p><i>Michael Schultz, Coordinator – DANUBIUS-RI Project, Senior Adviser - Romanian National Research and Development Institute for Marine Geology and Geoecology (UK)</i></p> <p><i>Stanica Adrian, PhD, Scientific Director of GeoEcoMar, Coordinator of the DANUBIUS-RI, Romania</i></p>
11.00 - 11.20	Coffee Break
11.20 – 15.00	<p><b>Round Table – 1<sup>st</sup> session</b></p> <p><b>Identifying perspective areas of S&amp;T cooperation between the EU and the Black Sea region in Resource Efficiency and Environment (related to water systems)</b></p>

	<p><b>Topic 1: Riverine systems in the Black Sea Region (ecological status, morphology, human impact, water quality);</b></p> <p><b>Topic 2: Coastal zones: morphodynamic changes, degradation, stability, technogenesis-related morphodynamic changes in the coastal zones and their impact on the coast stability and coast degradation;</b></p> <p><b>Moderator: Georgia Chantzi, Research Fellow, International Centre for Black Sea Studies (ICBSS, Greece)</b></p>
11.30 – 11.40	<p><b>Towards a Black Sea Coastline Classification Based on GIS for Assessment of Coastal Zone Risks and Planning Solutions</b></p> <p><i>Hristo Stanchev, PhD, Institute of Oceanology, Bulgarian Academy of Sciences, Varna, Bulgaria</i></p>
11.40 – 11.50	<p><b>Influence of the Coastal Zon Technogenezis-related Changes on the Coast Development</b></p> <p><i>Vakhtang Gvakharia, Expert, Scientific Research Firm Gamma / A. Janelidze Institute of Geology, Georgia</i></p>
11.50 – 12.00	<p><b>The Means of Discontinuation of the Black Sea Coast Degradation and Provision of Its Sustainable Development</b></p> <p><i>Irakli Papashvili, Leader of Marine Survey Group, GAMMA Consulting, Georgia</i></p>
12.00 – 12.10	<p><b>Development of the River Deltas of the Black Sea East Coast</b></p> <p><i>G. Lominadze, PhD, Head of Department of Geomorphology and Geoecology, Vakhushiti Bagrationi Institute of Geography, Javakhishvili State University</i>  <i>G.Kavlashvili, Vakhushiti Bagrationi Institute of Geography Georgia</i></p>
12.10 – 12.20	<p><b>The impact of the PERSEUS (FP7) Research Project on the Black Sea region</b></p> <p><i>Christos Ioakeimidis, Research Associate, Hellenic Centre for Marine Research (HCMR), Institute of Oceanography, Greece</i></p>
12.20 – 12.30	<p><b>The outcomes of FP7 DANCERS project as guidelines for the BSH later stages</b></p> <p><i>Stanica Adrian, PhD, Scientific Director of GeoEcoMar, Coordinator of the DANUBIUS-RI, Romania</i></p>
12.30 - 12.40	<p><b>The Sea of Azov – Black Sea Basin within the system of Large Marine Ecosystems</b></p> <p><i>Gennady Matishov, DChairman, Southern Scientific Centre, Russian Academy of Science, Russia irector, Murmansk Marine Biological Institute, Chairman, Southern Scientific Centre, Russian Academy of Science, Russia</i></p>
12.40 - 13.30	<p><b>Questions and answers, discussion</b></p>

13.30 - 14.30	Lunch
	<b>Round Table – 1<sup>st</sup> session</b> (Continuing)
14.30 – 14.40	<b>Determination of Hot Spots along Black Sea Coasts of Turkey &amp; Hot Black Sea Project</b> <i>Gulsen Avaz, Chief Senior Researcher, TUBITAK-Marmara Research Center, Environment Institute, Gebze, Turkey</i>
14.40 – 14.50	<b>Improvement of predictive models of the dynamics of natural and natural-economic systems in the transition zone "land-sea" within the borders of the Black Sea region countries</b> <i>Vladimir Iemelianov, First Vice-Chief Scientific Secretary of National Academy of Sciences, Chief Scientist of the Institute of Geological Sciences of NAS, Ukraine</i>
14.50 - 15.00	<b>Questions and answers, discussion</b>
15.00 – 16.30	<b>Round Table – 2nd session</b> <b>Identifying perspective areas of S&amp;T cooperation between the EU and the Black Sea region in Resource Efficiency and Environment (related to water systems)</b> <b>Topic 3: Material exploitation and ecological impact in the Black Sea Region (water nexus, environmental impact on water bodies and systems).</b> <b>Moderator : Elena Nasybulina, Lead expert at National Research University - Higher School of Economics (HSE, Russia)</b>
15.00 - 15.20	<b>Current state of surface waters' quality monitoring in Armenia and related issues</b> <i>Vardan Asatryan , PhD, researcher, Institute of Hydroecology and Ichthyology of SCZHE of National Academy of Sciences, Armenia</i>
15.20 – 15.30	<b>Environmental Impact of Floods in the Kura and Araz Rivers</b> <i>Islam Mustafayev , PhD, Head of Laboratory at Sector of Radiation Researches, Azerbaijan</i>
15.30 - 15.40	<b>Food web gradients: quantifying human impact on ecosystems</b> <i>Ferenc Jordan, scientific advisor, Danube Research Institute, Centre for Ecological Research, Hungarian Academy of Sciences, Hungary</i>
15.40 – 15.50	<b>On the participation of research institutions from Moldova in the Black Sea Program</b>

	<b>Elena Zubcov</b> , Head of Laboratory of Hydrobiology and Ecotoxicology, The National Council on Accreditation and Attestation, Moldova
<b>15.50 – 16.00</b>	<b>Caucasus Ecoregional Ecological Problems</b>  <b>Valery Shmunk</b> , Head of Northern Caucasus Regional Office, WWF, Russia
<b>16.00 – 16.30</b>	<b>Questions and answers, discussion</b>
<b>16.30 – 17.00</b>	<b>Coffee break</b>
<b>17.00 - 18.00</b>	<b>Report on identified perspective areas of S&amp;T cooperation between the EU and the Black Sea region in Resource Efficiency and Environment (related to water systems)</b>  <b>Georgia Chantzi</b> , Research Fellow, International Centre for Black Sea Studies (ICBSS, Greece)  <b>Elena Nasybulina</b> , Lead expert at National Research University - Higher School of Economics (HSE, Russia )  <b>Discussion, summing up, next steps</b>
<b>18.00</b>	<b>Closure</b>

Annex C. Agenda of Workshop 3, Sofia, 31.3.2016

## Black Sea Horizon International Workshop

**“Applied research in chemistry: Smart materials for a smart future”**

### Identifying perspective areas of STI Cooperation between the European Union and the Black Sea region in the field of smart materials

Sofia, 31 March 2016

Venue: European Commission Representation in Sofia (124, Rakovski st., Sofia, 1000)

## Agenda

9.00 – 09.30	Registration
09.30 – 10.00	<p>Welcome and introduction to the workshop</p> <p><i>Zoya Damianova, Programme Director of ARC Fund</i></p> <p><b>Presentation of the Black Sea Horizon project: identifying priorities for S&amp;T cooperation between the EU and the Black Sea region countries</b></p> <p><i>Georgia Chantzi, Research Fellow, International Centre for Black Sea Studies (ICBSS, Greece)</i></p>
10.00 – 11.15	<p><b>Plenary session/working groups</b></p> <p><i>Identifying perspective areas of S&amp;T cooperation between the EU and the Black Sea region in the field of smart materials<sup>1</sup></i></p> <p><b>Brief presentation on current research in the field of advanced materials in the respective country of each participant. List of suggestions for pertinent RTI topics to be included in future Horizon 2020, regional and international calls for proposals.</b></p> <p><b>Moderator: Georgia Chantzi, Research Fellow, International Centre for Black Sea Studies (ICBSS, Greece)</b></p>
	<p><b>“Carbon nanocatalysts are novel attractive means to obtain valuable chemical products and erasing petrochemical contaminants”</b></p> <p><b>Eldar Zeynalov (Institute of Catalysis &amp; Inorganic Chemistry, Azerbaijan NAS, Azerbaijan)</b></p>
	<p><b>“2D Hybrid materials: a tremendous potential for application in modern technology”</b></p> <p><b>Pierre Rabu (Institute of Physics and Chemistry of Materials of Strasbourg, France)</b></p>

<sup>1</sup> In the context of the Black Sea Horizon project smart or advanced materials include “green” materials, self-healing materials, piezoelectric materials, memory metals, advanced composites.

	<p><b>“Smart materials in molecular nanomedicine”</b></p> <p><b>Zoltan Varga</b> (Institute of Materials and Environmental Chemistry, RCNS, Hungarian Academy of Sciences, Hungary)</p>
	<p><b>“Smart materials in the Republic of Moldova”</b></p> <p><b>Olga Covaliova</b> (Institute of Chemistry of the Academy of Sciences of Moldova, Moldova)</p>
	DISCUSSION, suggestions of RTI topics
<b>11.15 – 11.45</b>	<b>Coffee Break</b>
<b>11.45 – 13.00</b>	<p><b>“Nanomaterials: from Synthesis to Applications”</b></p> <p><b>Agnieszka Dąbrowska</b> (University of Warsaw, Poland)</p>
	<p><b>“Smart materials for health based on spontaneous flora of Black Sea region”</b></p> <p><b>Aurelia Meghea</b> (Romanian Academy; University POLITEHNICA of Bucharest, Faculty of Applied Chemistry and Materials Science, Romania)</p>
	<p><b>“Recent advantages in low temperature proton exchange membrane fuel cells in Russia: materials development and application features”</b></p> <p><b>Andrey Yaroslavtsev</b> (Kurnakov Institute of General and Inorganic Chemistry, Russia)</p>
	<p><b>„Novel materials for future energy“</b></p> <p><b>Evgeny Antipov</b> (Lomonosov Moscow State University, Russia)</p>
	DISCUSSION, suggestions of RTI topics
<b>13.00 – 14.00</b>	<b>LUNCH Break</b>
<b>14.00 – 15.15</b>	<p><b>“Recent Progress on Solution Based Transparent Conducting Electrodes“</b></p> <p><b>Fevzihan Basarir</b> (TUBITAK Marmara Research Center, Turkey)</p>
	<p><b>“Progress of R&amp;D in the areas of Smart Composites based on Ceramics and Carbon Fibers”</b></p> <p><b>Andrey Ragulya</b> (Institute for Problems of Materials Science of the Ukrainian Academy of Sciences, Ukraine)</p>
	<p><b>“Agriculture as a source for advanced materials”</b></p> <p><b>Richard Smits</b> (CSI, Promoting the right chemistry, Bulgaria)</p>
	<p><b>“Innovative halogen-free flame retardants an methods for use”</b></p> <p><b>Lydia Kostova</b> (Interiorprotect Ltd., Bulgaria)</p>
	DISCUSSION, suggestions of RTI topics and key messages from the workshop

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15.15 – 15.45	Coffee Break
15.45 – 17.00	<p><b>Plenary session</b></p> <p><b>Summary of the suggested RTI topics</b> from the 3 thematic sessions.</p> <p><b>Validation of the suggested pertinent RTI topics</b> to be included in future Horizon 2020, regional and international calls for proposals.</p> <p><b>Moderator: Zoya Damianova</b>, Programme Director, ARC Fund, Bulgaria</p> <p><b>Definition of key messages from the workshop.</b></p> <p><b>Moderator: Elena Nasybulina</b>, Lead expert at National Research University - Higher School of Economics (HSE, Russia)</p>