D2.6 Multilevel assessment and Gap Analysis

***IASON**:* Fostering sustainability and uptake of research results through Networking activities in Black Sea & Mediterranean areas

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[1] **R** = Report, **P** = Prototype, **D** = Demonstrator, **O** = Other

[2] **PU** = Public, **PP** = Restricted to other programme participants (including the Commission Services), **RE** = Restricted to a group specified by the consortium (including the Commission Services), **CO** = Confidential, only for members of the consortium (including the Commission Services).

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ABBREVIATIONS

Term	Explanation
APR	Annual Progress Report
BCR	Bi-monthly Control Report
BS	Black Sea region
BSC	Commission on the Protection of the Black Sea Against Pollution (Black Sea Commission)
CA	Consortium Agreement
CB	Capacity Building
CIP	Cooperative Information Portal
CSW	Catalogue Service for the Web
DB	Database
EC	European Commission
EC-GA	European Commission Grant Agreement
EC-PO	European Commission Project Officer
EEA	European Environmental Agency
ENP	European Neighborhood Policy
ENPI	European Neighborhood and Partnership Instrument
EO	Earth Observation
FP7	European Union Seventh Framework Programme
FPR	Final Project Report
GEO	Group on Earth Observation
GEOSS	Global Earth Observation System of Systems
GUI	Graphical User Interface
H2020	EU Programme for Research and Innovation: Horizon 2020
ICPDR	International Commission for the Protection of the Danube River
MED	Mediterranean region
PCC	Project Coordination Committee
PM	Project Manager
PNF	Permanent Networking Facility
PPR	Periodic Project Report

PR	Partner Representative
SEIS	Shared Environmental Information System for Europe
SoS	System of Systems
TL	Task Leader
WCS	Web Coverage Service
WFS	Web Feature Service
WMS	Web Map Service
WP	Work Package
WPL	Work Package Leader
WPS	Web Processing Service

Contents

EXECUTIVE SUMMARY

The Black Sea and Mediterranean regions are important areas for all the three thematic pillars that are specific objectives of the IASON project (i.e. coastal monitoring, water and soil management, mining and mineral exploration), and even more when wider topics from Horizon 2020 Societal Challenge 5 are considered (i.e. Climate Action, Environment, Resource Efficiency and Raw Materials).

The information collected during the first year of activities in the IASON project, and stored in the Initiatives and Stakeholders database (currently evolving to a full IASON Permanent Networking Facility), demonstrates that several research and networking activities were and are funded by the European Union in the context of different programmes, on the topics of interest. However, while Climate Action and Resource Efficiency topics are well-covered and often linked with each other, the Raw Materials topic has less coverage and it is usually not connected with the others.

IASON partners are also involved in on-going overarching initiatives, like the Black Sea Commission or the European Neighborhood and Partnership Instrument (ENPI) programme which have long-term strategies and objectives relevant to the IASON topics, for example implementing existing conventions at European and global level. A link between research and networking activities and those overarching initiatives, for example through agreements with institutions active in the areas of interest, would be useful for achieving better alignment of objectives and mobilization of resources.

The strong link between activities in the Black Sea and Mediterranean regions highlights how Balkans play an important role, as a bridge between the two regions.

Many research activities in the areas of interest produce EO resources, but not all of them are easily and openly available. Specific actions directed to the uptake of past projects outcomes, including datasets and other resources, may be effective, producing immediate results often with minor effort.

Most of the countries belonging to the two regions are members of the Group on Earth Observation. The actions recently carried out to bring Armenia and Georgia in GEO are success stories which might be replicated in other countries which are still not members.

It is noteworthy that the previous conclusions are based on the outcomes of activities which are still on-going in IASON and parallel projects (e.g. EOPOWER), and therefore should be considered as preliminary results.

1. INTRODUCTION

The present document is the deliverable D2.6 of the IASON Project, dedicated to a multilevel assessment and gap analysis. It aims to contribute to one of the general objectives of the ENV.2013.6.5-4 call: "*The final product will be concrete proposals for upgrading the joint research and innovation agenda at more strategic levels and **linking major EU projects or clusters of them with projects/networks in the countries of the region and the potential users**, such as policymakers and industry. It will also identify potential sources of funding (national, EU, international) other than FP7*" [ENV.2013.6.5-4].

To this aim the IASON WP2 defined an operational objective on devising "*a tailor made **networking and collaboration strategy of capacity building and technology transfer** according to the specific EO needs of the three major challenges*" [IASON-DOW].

D2.6 collects the outcomes of the task T2.3 aiming to "*perform an in depth analysis to detect the **strengths and weakness of each region in the three predefined focal research fields***" and "*identify **countries' potentials for future cooperation** in the three focal areas (coastal monitoring, water and soil management, mining and mineral exploration)*" [IASON-DOW].

T2.3 leveraged the work carried out in the context of several other IASON Work Packages and Tasks. In particular:

- Previous activities in WP2 on "Assessment of existing and on-going research efforts in the Mediterranean and Black Sea" provided the base for an analysis of existing research and networking activities in the Mediterranean and Black Sea regions (documented in D2.1, D2.2, D2.3 and D2.4).
- The IASON PNF developed in WP2 based on the BalkanGeoNet PNF and complemented with information on funding organizations from WP4 on "Comparing research agendas and Sustainable Funding" provided the information base for further exploration and analysis.
- T5.1 on "Technology transfer for the assessment of needs and priorities in the Black Sea and Mediterranean" of the WP5 on "R&I Uptake of Applications Results in Fostering collaborative Future action in MED and BS regions",

provided a toolkit (Web Visualization toolkit) used for visual inspection and analysis of the IASON PNF.

- T5.2, T5.3 and T5.4 on “Uptake of results…” linked to previous projects provided information on thematic coverage, resource availability and participation in overarching initiatives.

The present document is conceived both as a self-contained document on assessment and gap analysis and as an input - in parallel with WP4 activities - towards the general objective of fostering cooperation between countries and programmes in the Black Sea and Mediterranean region concerning the three focal areas cited in the call (coastal monitoring, water and soil management, mining and mineral exploration) and more generally the three thematic pillars of Horizon 2020 Societal Challenge 5 (i.e. climate action, resource efficiency and raw materials).

The document is structured in three major sections. A first section describes the methodological approach. The other two sections are dedicated to one of the regions of interest each (Black Sea and Mediterranean, respectively). Both those sections are structured on: a) assessment of research and networking activities, b) thematic coverage, c) resources availability, d) participation in overarching initiatives. A final section draws some general conclusions.

2. METHODOLOGY

The present deliverable builds on the activities carried out in the first months of the IASON project, in particular on: a) the information collected in the IASON PNF, b) the results of uptake and gap analysis from specific projects, and c) analysis tools for the identification of needs and priorities.

The available information is then analyzed, discussed and organized as follows. We present the results in two separate sections each dedicated to one of the regions of interest: Black Sea region and Mediterranean region. Indeed, although, in some cases, this approach poses difficulties - e.g. due to initiatives interesting both regions or even with European or global scope - we preferred to report assessment analyses separately in order to better address specificities. For each section we provide the assessment and gap analysis, and suggestions and recommendations. Assessment and gap analysis are organized on three axes:

a) research and networking initiatives (*how many initiatives are addressing the region of interest?*),

b) thematic coverage (*are all the call themes, and Societal Challenges topics, well covered in the region of interest?*),

c) resources availability (*are datasets, models, and other resources available on the region of interest?*)

d) Participation in overarching initiatives (*are country in the region of interest active in overarching initiatives on resource sharing?*)

For item a) and b) the main source of information is the IASON PNF with the information included at the time of the Initiatives and Stakeholders DBs issue (May 2014). Other information has been collected in the meantime (e.g. for Egypt), but it could not be included in the PNF since the submission GUI will be published in November 2014. Therefore such information could not be considered in this analysis.

For item c) besides considering the information provided in the IASON PNF, a query of GEOSS has been done. This was considered useful taking into account the focus given on use of and contribution to GEOSS in the Work Programme for Societal Challenge 5 of HORIZON 2020.

In general, information from the IASON DB has been extracted, either directly querying the database, or using the visualization toolkit developed in the IASON project itself.

For both items b) and c) information from the IASON tasks on the uptake of results from previous projects is considered, allowing a deeper inspection of relevant initiatives and projects.

2.1 Open issues

Some issues affect the conclusions of the present deliverable mainly due to timing, with relevant activities running in parallel

a) As said above, the IASON PNF actually includes only the first set of initiatives and stakeholders collected by WP2 in the first phases of the IASON project. It is expected that the available information will increase with the release of the IASON PNF GUI (November 2014) that will allow direct uploading of information by project coordinators, and stakeholders.

b) Most of the information currently stored in the PNF is related to European projects, in particular those funded under the Seventh Framework Programme. Therefore a bias can be present in the current analysis, overestimating the contribution from global, European, and regional initiatives, and underestimating contribution from national initiatives.

c) The information on funding organization collected by WP4 is under merging in the IASON PNF. It requires slight changes in the internal DB structure, and consequently in the visualization toolkit. Thus no result from visual analysis of funding organization could be included in the present deliverable.

We addressed the previous issues gathering information from other sources where possible - e.g. from ENPI-SEIS activities in the Mediterranean. However it is expected that more information will be collected and made available, e.g. through the PNF, in the following months. Depending on the impact of the new information, the need of an update of the present deliverable will be evaluated.

3. BLACK SEA REGION

3.1 Description

For the purposes of the IASON project, the Black Sea region comprises the countries shown in Table 1 and Figure 1 [IASON D2.1] [IASON D2.2] [IASON D2.3] [IASON D2.4]. They include countries of the Danube Basin even if they are geographically far away from the Black Sea. The reason of this choice is that IASON is interested in

thematic pillars (Climate Actions, Environment, Resource Efficiency and Raw Materials) with potentially high impact on socio-economic aspects. Therefore IASON needs to include all the countries with potential interest in the Black Sea region in a broader sense.

Black Sea Countries (BS) (including Danube Basin)
Albania*
Armenia
Austria*
Azerbaijan
Belarus*
Bosnia & Herzegovina*
Bulgaria
Croatia*
Czech Republic*
Former Yugoslav Republic of Macedonia (FYROM)*
Georgia
Germany*
Greece
Hungary*
Moldova
Montenegro*
Romania
Russian Federation
Serbia*
Slovakia*
Slovenia*
Turkey
Ukraine

*: included as belonging to the Danube Basin

Table 1 Countries included in the Black Sea region by the IASON project

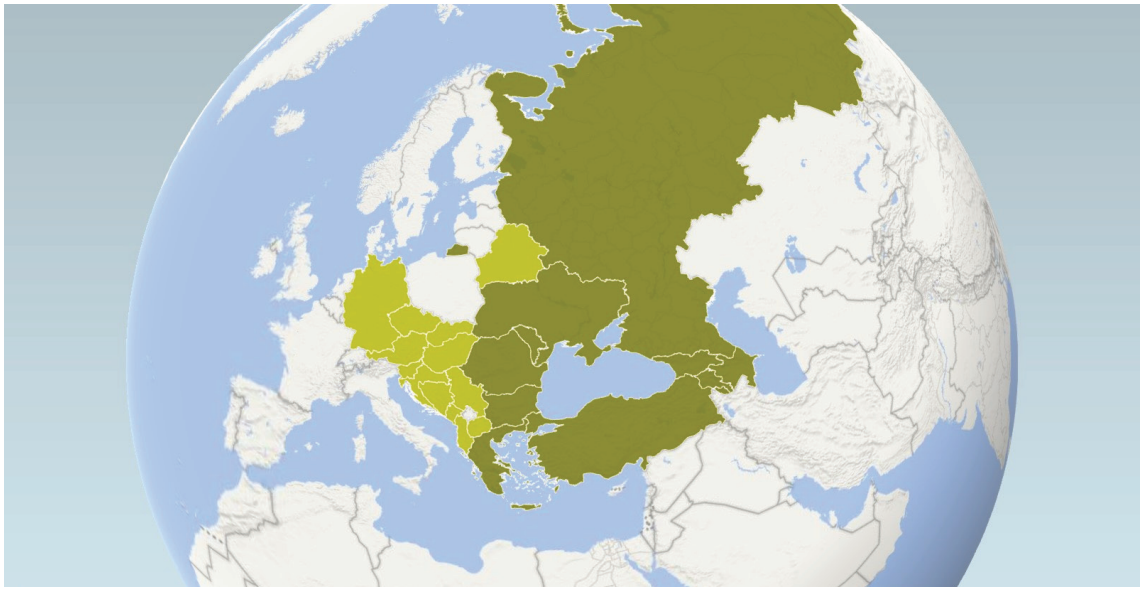

Figure 1 Map showing countries included in the Black Sea region (in light colour those included as part of the Danube basin)

3.2 Assessment and gap analysis

3.2.1 Research and networking activities

The IASON deliverables D2.2 and D2.4 presented some relevant outcomes from the analysis of the IASON PNF:

a) The Black Sea region is well-covered by research and networking initiatives, especially concerning EU-funded initiatives.

b) a few percentage of projects (11% for research activities, 18% for networking activities) is specifically focused on the Black Sea region. Indeed, in most cases Black Sea is considered as one of the addressed regions along with Mediterranean or even wider regions. This may suggest that while the Black Sea region is well-covered by research and networking projects, some of its specificities might be missed.

c) The Raw Materials topic is less covered than the other two (Climate Actions and Resource Efficiency). This may be due to the fact that Black Sea is often proposed as a use-case for studies on marine environments, usually considered as having impact on climate and resources, more than as a geographical region including land areas surrounding it.

The inspection of the IASON PNF through the IASON Web-based Visualization Toolkit (Figure 2) shows how the Initiatives are distributed through the different geographical areas of interest. Since most of the current content in the IASON PNF includes European co-funded projects, most of the projects have European coverage. However many projects have specific interest in at least one of the IASON areas of interest. As it is expected, while a few projects have interest on both the Black Sea and the Mediterranean region, most of them are focused on only one of the areas. However, it is noteworthy that the Balkan region act as a bridge with projects that are focused on both the Balkans and one of the IASON regions of interest. This is justified by the central geographical position of the Balkans.

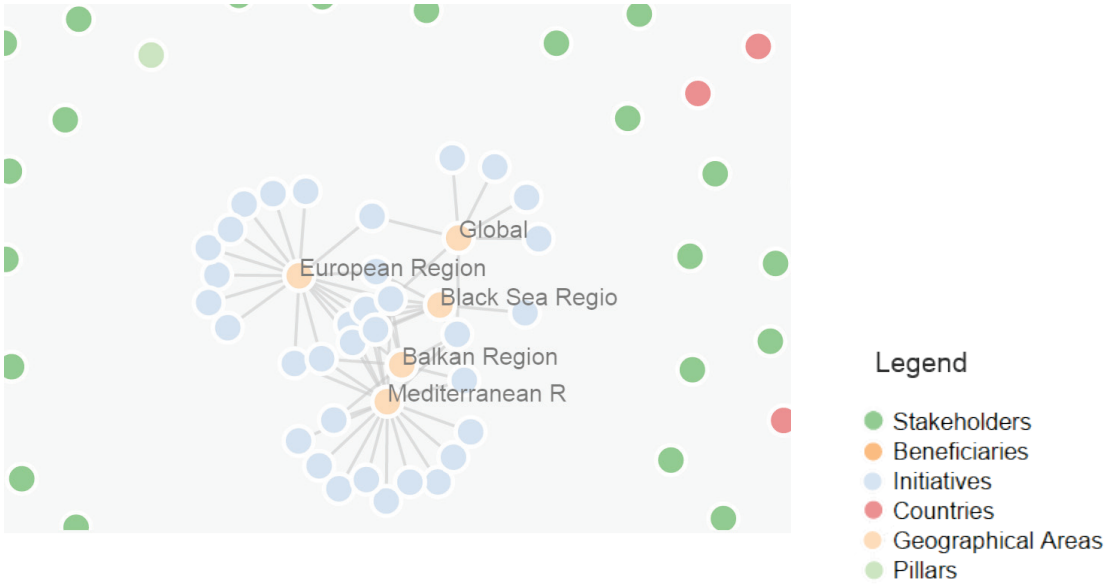

Figure 2 Initiatives vs. Geographical Area in the IASON PNF

In the Black Sea region there are also relevant overarching initiatives and programmes such as the Commission on the Protection of the Black Sea Against Pollution (Black Sea Commission), and the International Commission for the Protection of the Danube River (ICPDR).

3.2.1.1 Black Sea Commission

The Commission on the Protection of the Black Sea Against Pollution (the Black Sea Commission or BSC) is the intergovernmental body established in implementation of the Convention on the Protection of the Black Sea Against Pollution (Bucharest

Convention), its Protocols and the Strategic Action Plan for the Environmental Protection and Rehabilitation of the Black Sea.

3.2.1.2 International Commission for the Protection of the Danube River

The International Commission for the Protection of the Danube River (ICPDR) is a transnational body, which has been established to implement the Danube River Protection Convention, the major legal instrument for cooperation and trans-boundary water management in the Danube River Basin. It works to ensure the sustainable and equitable use of waters and freshwater resources in the Danube River Basin.

MOUs have been signed in summer 2014 between the University of Geneva and the Black Sea Commission as well as the ICPDR, containing agreements on how to follow-up on the collaboration established on the frame of the enviroGRIDS project.

3.2.2 Thematic coverage

As anticipated in the D2.1-4, Climate Actions and Resource Efficiency are more covered than Raw Materials. The Web Visualization Toolkit also shows that Climate Actions and Resource Efficiency are inter-related. Many initiatives address both the topics, while Raw Materials topic is usually addressed by specific initiatives. This is clearly visible in Figure 3 where no distinction is done between geographical regions. Visualizing also geographical region is not much helpful; however, no particular difference emerges for Black Sea.

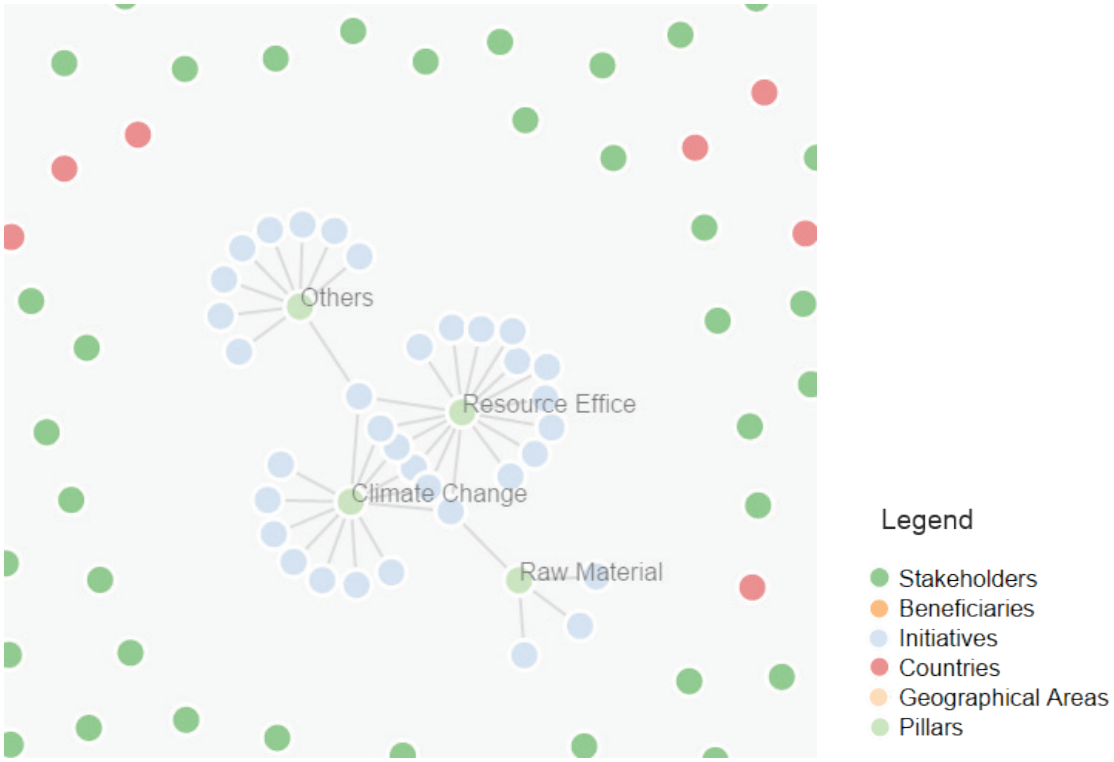

Figure 3 Relationships between Initiatives (in light blue) and thematic Pillars (in light green)

Through the Web Visualization toolkit it is also possible to analyse the relationships between initiatives and their target beneficiary categories (Figure 4). Most of the initiatives target both researcher and policy-makers. Other initiatives target SMEs (often together with either researchers or policy-makers) while only a few initiatives address citizens. This is coherent with the fact that most of the initiatives currently included in the IASON PNF are FP7 research or collaboration projects therefore addressing their usual beneficiaries: researchers and policy-makers. Only recently EU calls in FP7 and then in H2020 have focused attention on citizens.

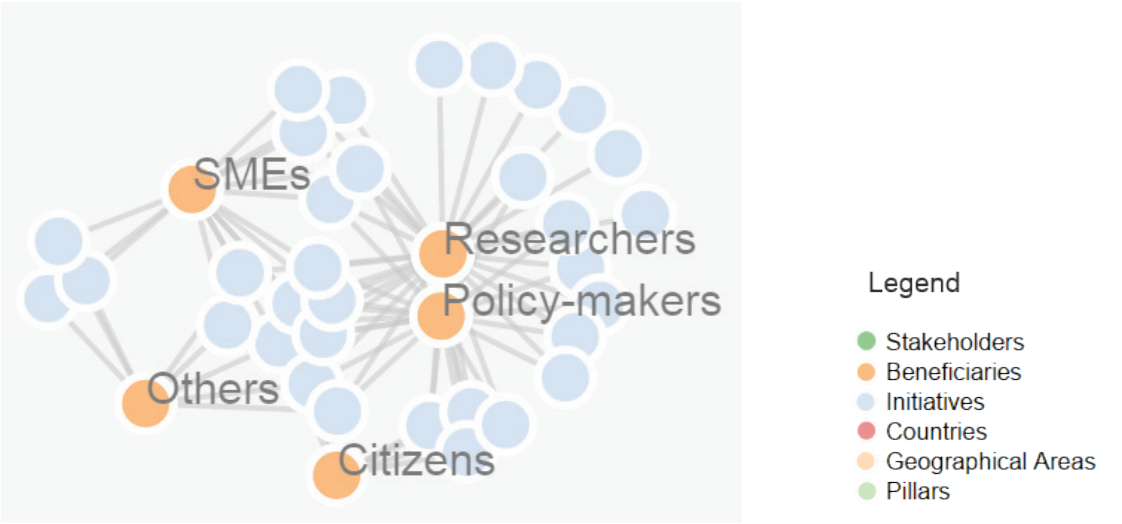

Figure 4 Relationships between Initiatives (in light blue) and Beneficiary categories (in orange)

3.2.3 Resources availability

The analysis of the IASON DB shows that 5 of the 8 initiatives addressing the Black Sea declare provision of geospatial data and/or services that is about 62%. All of them provide resources as open access (full or share-alike conditions).

Through the GEO Portal about 162,000 datasets (6% are GEOSS Data-CORE) are found on the Black Sea region and about 247,000 (6% are GEOSS Data-CORE) including the Danube Basin area[3], therefore suggesting that information is available but only a low percentage is open and free according to the GEOSS Data Sharing principles.

Beside datasets, other interesting resources are available. In particular concerning scientific models, IASON dedicated a specific task (T5.3) to the uptake of results of the enviroGRIDS FP7 project. EnviroGRIDS built a grid-enabled SDI to support running of hydrology-oriented models (e.g. SWAT: Soil and Water Assessment tool). T5.3 resulted in the publication of more than 200 water-related data layers and in the

[3] The GEO Portal only allows for searching with rectangular bounding boxes, therefore the results are obtained with an approximation of the region shapes, and should be considered only as an indication and order of magnitude. Search was done using “overlaps” option for matching query bounding box and datasets spatial coverage.

publication of an online geospatial data extractor for facilitating the access and/or the assemblage of SWAT input and output datasets.

3.2.4 GEO membership

Strictly considering the Black Sea region, 9 countries on a total of 10 (90%) are already members of GEO, and two of them (Armenia and Bulgaria), a 9%, are new entries in 2014, showing a growing interest in EO and GEO/GEOSS. For Armenia see §4.2.5.1; Bulgaria became a new GEO member in June 2014 following the Bulgaria's Council of Ministers Decision to accept the Bulgarian membership in the Group of the Earth Observation – GEO through the Ministry of Investment Planning. Azerbaijan is the only country still not member of GEO in the Black Sea region. Considering also the Danube Basin we have 18 countries on a total of 23 (78%) which are already members of GEO (see Table 2 and Figure 5).

Black Sea Countries	GEO member
Albania*	NO
Armenia	YES (from 2014)
Austria*	YES
Azerbaijan	NO
Belarus*	NO
Bosnia & Herzegovina*	NO
Bulgaria	YES (from 2014)
Croatia*	YES
Czech Republic*	YES
Former Yugoslav Republic of Macedonia (FYROM)*	NO
Georgia	YES
Germany*	YES
Greece	YES
Hungary*	YES
Moldova	YES
Montenegro*	NO
Romania	YES
Russian Federation	YES
Serbia*	YES
Slovakia*	YES
Slovenia*	YES
Turkey	YES
Ukraine	YES

*: included as belonging to the Danube Basin

Table 2 GEO membership for Black Sea countries

Figure 5 GEO membership for Black Sea and Mediterranean countries (from GEO portal)

3.2.5 Success stories

3.2.5.1 Armenia

For Armenia, the success story concerns the collaboration between two Armenian institutions, namely the Center for Ecological-Noosphere Studies (CENS) and the Institute for Informatics and Automation Problems (IIAP), to integrate an environmental Spatial Data Infrastructure (SDI) hosted by CENS and a distributed computing infrastructure hosted by IIAP. This collaboration resulted in the development of a portal using Web Processing Services (WPS) to calculate some environmental indices such as the "Normalized Difference Vegetation Index" (NDVI) [ASTSATRYANa] [ASTSATRYANb]. In parallel to this collaboration, actions have been undertaken by Armenia to become a new GEO member, which resulted in Armenia's GEO membership in September 2014.

3.2.5.2 Georgia

For Georgia, the success story consists in the institutional processes of data sharing and standardization that resulted in the acceptance of Georgia as a new member of the Group on Earth Observations (GEO) in December 2013.

4. MEDITERRANEAN REGION

4.1 Description

For the purposes of the IASON project, the Mediterranean region comprises the countries shown in Table 3 and Figure 6 [IASON D2.1] [IASON D2.2] [IASON D2.3] [IASON D2.4].

Mediterranean region (MED)
Albania
Algeria
Bosnia & Herzegovina
Croatia
Cyprus
European Union
Egypt
France
Greece
Israel
Italy
Lebanon
Libya
Malta
Monaco
Montenegro
Morocco
Slovenia
Spain
Syria
Tunisia
Turkey
Palestinian Authority

Table 3 Countries included in the Mediterranean region by the IASON project

Figure 6 Map showing countries included in the Mediterranean region

4.2 Assessment and gap analysis

4.2.1 Research and networking activities

The IASON deliverables D2.1 and D2.3 presented some relevant outcomes from the analysis of the IASON PNF:

a) The Mediterranean region is well-covered by research and networking initiatives, especially concerning EU-funded initiatives.

b) a relevant percentage of those projects (36% for research activities, 39% for networking activities) is specifically focused on the Mediterranean region. This suggests that Mediterranean region is well-covered both as part of wider areas, and with specific initiatives.

c) The Raw Materials topic is less covered than the other two (Climate Actions and Resource Efficiency). This may be due to the fact that, as for Black Sea, the Mediterranean region is considered for studies on marine environments, usually considered as having impact on climate and resources, more than as a geographical region including land areas surrounding it.

In the Mediterranean region there are also relevant overarching initiatives and programmes like the United Nations Environment Programme (UNEP) Mediterranean Action Plan (MAP) for the Barcelona Convention, the MED Programme on European territorial Cooperation 2007-2013, the ENPI and ENPI-SEIS. In particular, the ENPI-SEIS project provides valuable information on the Mediterranean region.

4.2.1.1 ENPI SEIS Project

The project 'Towards a Shared Environmental Information System (SEIS) in the European Neighbourhood' was launched in December 2009 to promote the protection of the environment in the European Neighbourhood region through the European Neighbourhood Partnership Instrument (ENPI).

The project is implemented by the European Environment Agency (EEA) together with partner countries in the ENP South, ENP East and the Russian Federation, bringing together national environmental and statistical organisations leading in the field of environmental information. It will provide a long-term and sustainable perspective for cooperation with the partner countries, as part of the cooperation within the policy framework of the Eastern Partnership, Union for the Mediterranean, Horizon 2020 Initiative, etc.

The project aims to promote the protection of the environment in the countries of the ENPI area by extending the principles of the Shared Environmental Information System (SEIS) to the Neighbourhood area, and developing the capacities of the relevant authorities responsible for environmental data management and reporting. The SEIS is an EU initiative to modernise and simplify the collection, exchange and use of the data and information required for designing and implementing environmental policy [SEIS].

The project works with the national environmental and statistical organisations responsible in the field of environmental information within the ENPI area (ministries, agencies and statistical offices responsible for collecting, producing, storing and disseminating environmental data and information). It helps to develop the capacities of the relevant authorities in the areas of cooperation, networking, monitoring, data management, assessment and indicator-based reporting on the environment. It also provides long-term and sustainable prospects for cooperation with partner countries.

The main outcomes of the ENPI-SEIS project address three SEIS components – cooperation, content and infrastructure –through enhanced networking with the national capacities on environmental information. Furthermore, it promotes open, public access

to information through compatible and freely available exchange tools (For more information please visit http://enpi-seis.ew.eea.europa.eu/).

ENPI-South component for networking gap analysis in the Mediterranean Region

The geographical area covered by the project is laid out in regulation EC/1638/2006 establishing a European Neighbourhood and Partnership Instrument (ENPI), and the following countries has been grouped into the region South: Algeria, Egypt, Israel, Jordan, Lebanon, Libya, Morocco, Palestine, Tunisia.

The setting-up of the environmental institutions and dedicated governance bodies in ENP South countries is relatively new. Until recent years, responsibility for the environment was shared among several ministries. It is only during the last decade that countries put efforts in establishing comprehensive and modern environmental administrations. Environmental governance is currently ensured mainly by a Ministry of Environment but also by other ministries such as ministries of agriculture (water and forests), planning (waste management), interior (waste-water, waste management), health, etc. Within the environment bodies, most of the countries established a national authority or executive agencies (mainly environmental observatories) that ensure the function of environment and sustainable development observatory and assessment. As to the collection and publishing of statistical data on the state of the environment, in addition to the environmental observatories, National Statistical Offices also handle part of the environment statistics activities, but still play a minor role (Draft SEIS State of Play Report).

The project also foresees technical assistance supports to Southern Mediterranean Countries in order to support their activity in a more sustainable way. To do this, requirements have been collected to support the gap analysis on the matter of data creation, management and sharing. Requirements are described below for Egypt, Israel, Jordan, Morocco, Palestine, Tunisia and Turkey.

Egypt

The Egyptian Environment Agency (EEAA) receives environmental data from a number of national institutions and organisations. The quality of data provided varies a lot and the Agency considers important a national inter-institutional joint effort to improve environmental data quality.

EEAA (Egyptian Environmental Agency) needs a data quality assurance system and of data quality controls linked with the data quality standards required by H2020 Initiative and overall assessment of the national environmental data supply chain.

A method for pointing out possible data inconsistency to data providers is needed, as well as guidelines for the replication/extension of the quality assurance system and follow-up support will be provided to EEAA.

Quality assurance and IT field are the main lacks identified.

Networking capacity: low

Main needs: data standardisation; quality control/assurance

Israel

The environmental information management sector is quite advanced. Israel is currently studying mechanisms and facilities to streamline the provision of environmental data by the different entities involved in the national environmental reporting mechanism and welcome a general tutoring/mentoring support by European experts on the design and implementation of such mechanisms. The intention of designing and implementing a national “business to government” reporting and compliance system which would allow industries to comply with existing reporting obligations. Need of advising and support on specific environmental information management and reporting aspects.

Networking capacity: high potential

Main needs: EIS management and data flow

Jordan

Jordan considers important to reinforce national capacities for working with Reporting activities and information flow. Technical capacities have to be developed for data generation, elaboration and provision including quality assurance methods for the development of GIS applications and data management. Experience in IT field has to be also developed, especially in the field of environmental information and environmental reporting.

Networking capacity: none

Main needs: Data creation, management and flow

Morocco

The Moroccan National Observatory on Environment (ONEM) is coordinating the implementation of a national environmental information system with a strong sub-national component. The implementation of the system is in a quite advanced stage, yet collaborative mechanisms, procedures and tools for coordinating and standardising the contributions by regional agencies to the system are still to be defined in detail, put in practice and tested.

Efforts are needed to align reporting activities and SEIS principles in the National Environmental Information System (in particular on quality assurance), through the establishment of obligations, procedures, templates and data dictionaries, and data quality control mechanisms. Also, testing procedures and tools for standardising the contributions by regional agencies are needed.

For Morocco it is possible to benefit from the in depth analysis provided by the Country visit Report to provide the gap analysis. In particular:

- Morocco is in a process of strengthening environmental management structures (development of a network of Environment and Sustainable Development Observatories in each of the 16 Moroccan regions), and legal reforms according to the Chart of the Environment recently signed (e.g. law on access to the environmental information, framework law on water quality)
- The national environmental management structure is currently being built up
- Morocco was very open to the SEIS series of principles. However, it is not fully clear to which extent decision makers higher up in the hierarchy of the Ministerial departments fully support these principles
- There is a need to enhance coordination between institutions (e.g. statistical services, Ministry of Industry and Transport) and clarify the sharing of responsibilities among institutions, and to find ways to more deeply involve Ministry of Industry in the development of integrated report
- There is a need to give further consideration to the support by authorities to the implementation of the marine and coastal monitoring system

- There is room for developing PRTR in Morocco, improving the process of collection in industrial emissions
- There is inconsistency risk between current geographic information systems have been noted due to the production of parallel geospatial reference data sets by digitising various geospatial data sources
- Most datasets are based on access/excel/oracle that need update. Mechanisms for continuous updating of raw data are only in place in a very limited number of cases
- There is an interest in starting the analysis of available information chains in the MAP / EU (indicators; SEIS experience)
- Need to develop of a common understanding on the process “data-indicators-assessment” and consequently, the development of appropriate governance models
- Semantic harmonisation of data sets, definitions, models need improvement
- There is a need for assistance and advice in setting up of the new environmental information system
- Further development and support would be needed with Implementation of services based on a distributed architecture (interfacing standards specifications, etc.)
- Data policy: defining conditions for accessing and (re)using environmental data
- There is a need to develop a common set of indicators aiming at concretely federate the sharing of information. The analysis for the development of these indicators can start by studying existing material namely EU list / MAP indicators proposal
- It is important to clarify the concept of geospatial reference data in countries and allow an effective sharing of reference data
- It is relevant to consider the use of drivers for the establishment of coordination mechanisms and responsibility sharing among institutions (e.g.: developing environmental accounts with the Direction for Statistics, involving the ministry of industry in the definition of specific indicators)

- It is necessary to develop a common understanding on the process "data-indicators - assessment" and therefore develop an appropriate governance model

Networking capacity: High potential

Main needs: sustainable data policy, sematic harmonisation, national and international coordination.

Palestine

Palestine focused either on the provision of technical assistance for the identification and installation of a web GIS software platform and utilisation of Reporting tools to serve national environmental reporting needs. Investigations on a possible web GIS software meeting Palestinian requirements regarding the type of web server.

Technical assistance support is needed for installation and configuration of GIS desktop/Server and training activities for technicians on the utilisation and management of the tools. Need to address discussion on national priorities in the environmental information management sector.

Networking capacity: low

Main needs: data publication and sharing

Tunisia

Information management result the domain for the provision of technical support for thematic activities (e.g. air quality). It needs a focus on developing of effective methods and tools for communicating information to decision makers and the general public, in particular using the internet.

The setting up of a web based GIS and building the necessary capacities for developing management skills of such of software application for environmental data management are needed.

It needs to develop an effective method and tools for communicating information to decision makers and the general public. European and Mediterranean good practices and technical specifications (e.g. INSPIRE) would be the right starting point to achieve this result.

Networking capacity: low

Main needs: data management, flow and publication; IT, data & information standardisation

Turkey

The Turkish SEIS country visit reports on current information systems and country capacity for taking SEIS implementation forward.

About governance, EU Directives has been transposed into the national legislation. The reporting obligations will not come into force until Turkey becomes a member of the European Union. The transposition and implementation of INSPIRE Directive is a major driver towards the development of a shared environmental information infrastructure.

About infrastructure and networking, environmental data is produced by many institutions in Turkey; however, at present it is not possible to reach this data electronically over a single network. In 2002, a programme was launched to establish an Environmental Information System (EIS) for all the ministries and institutions in the environmental sector. As a first step, the EIS was only established inside the Ministry of Environment and Forestry (MoEF), allowing data access and data entry by web-based interfaces.

In 2008, a project on Establishment of Turkish Environmental Information Exchange Network (TEIEN) has been initiated, aiming at collecting countrywide environmental information, to use environmental information system implementations and to ensure timely and reliable data flow. Framework and bilateral protocols have been established and signed as an initial step to share environmental data among institutions.

In conclusion, pending the completion of the EU accession process, the environmental data acquisition has not been fully harmonised with Turkish legislation yet. Due to this fact, collection of environmental data and type of the data being collected presents differences, leading to some difficulties in environmental reporting. Finally, the IT infrastructure of the institutions collecting environmental data is still under development, therefore problems and delay are expected towards their integration into a fully SEIS compliant system.

Networking capacity: high potential

Main needs: data harmonisation, flow and publication.

4.2.2 Thematic coverage

A visual analysis using the Web Visualization toolkit allows highlighting relevant information on the relationships between the initiatives in the Mediterranean region and their thematic objective and beneficiary categories. Results are not easily differentiated between Mediterranean and Black Sea region, so only general results reported in section 4.2.1 can be considered also for the Mediterranean area.

4.2.3 Resources availability

The analysis of the IASON DB shows that 9 of the 14 initiatives addressing the Black Sea declare provision of geospatial data and/or services, which is about 64%. Only 5 of them provide resources as open access (full or share-alike conditions), that is about 55%.

Through the GEO Portal about 423,000 datasets (6% are GEOSS Data-CORE) are found on the Mediterranean region[4], therefore suggesting that information is available but only a low percentage is open and free according to the GEOSS Data Sharing principles.

4.2.4 GEO membership

Mediterranean region Countries	GEO Member
Albania	NO
Algeria	YES
Bosnia & Herzegovina	NO
Croatia	YES
Cyprus	YES
European Union	YES (through European Commission)
Egypt	YES
France	YES
Greece	YES
Israel	YES
Italy	YES
Lebanon	NO

[4] The GEO Portal only allows for searching with rectangular bounding boxes, therefore the results are obtained with an approximation of the region shapes, and should be considered only as an indication and order of magnitude. Search was done using “overlaps” option for matching query bounding box and datasets spatial coverage.

Libya	NO
Malta	YES
Monaco	NO
Montenegro	NO
Morocco	YES
Slovenia	YES
Spain	YES
Syria	NO
Tunisia	YES
Turkey	YES
Palestinian Authority	NO

Table 4 GEO membership for Mediterranean countries

In the Mediterranean region, 15 countries on 23 (65%) are already members of GEO (see Table 4 and Figure 5). It is noteworthy that no change in membership happened since 2008 when Turkey joined GEO.

5. CONCLUSION AND RECOMMENDATIONS

According to the previous analyses it is possible to draw some conclusions and recommendations:

a) The Black Sea and Mediterranean regions are already addressed by a good amount of research and networking projects at European level; in parallel there are relevant overarching initiatives like BSC and ICPDR for Black Sea and UNEP and ENPI for the Mediterranean. Agreements between those initiatives and organization active in research and networking at European level may help to align projects activities with European level strategies and long-term objectives. Existing MoUs between University of Geneve and BSC and ICPDR are a valuable example.

b) The Balkan region plays an important role as a bridge between Black Sea region and the Mediterranean area including North Africa, and Middle East. Therefore it is important to take into account Balkans for example when topics addressing sea regions are considered (e.g. for Climate actions and environment).

c) Production and use of in-situ and EO data for the thematic areas should be encouraged, especially in the context of European and global programmes, such as GEOSS and Copernicus. To this aim:

    a. FP7 EOPOWER project might provide recommendations and examples for EO results valorization and exploitation.

    b. IASON demonstrated how actions focused on the uptake of previous projects outcomes can be successful to implement a quick win approach.

d) Actions should be directed to unleash the potential of EO resources by exploring policies and encouraging open access, for example providing datasets as GEOSS Data-CORE. Outcomes from FP7 RECODE project and Research Data Alliance (RDA) working groups might provide useful recommendations.

e) Membership and participation to GEO should be encouraged. Success stories reported for Armenia and Georgia might be replicated for non-member

countries in Black Sea (and Balkan) area - such as Azerbaijan - and Mediterranean area.

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