Coordinating and integRating state-of-the-art Earth Observation Activities in the regions of North Africa, Middle East, and Balkans and Developing Links with GEO related initiatives towards GEOSS

D6.8: Mid-term Implementation Report on Stakeholder Engagement

Contract Number	H2020 SC5-18b-2015, Project GA number: 690133	**Acronym**	GEO-CRADLE
Full title	Coordinating and integRating state-of-the-art Earth Observation Activities in the regions of North Africa, Middle East, and Balkans and Developing Links with GEO related initiatives towards GEOSS.		
Project URL	http://geocradle.eu		
EC Project Officers	Ms Gaëlle LE BOULER & Ms Malgorzata ROGIVAL		

Deliverable / Document	**Number**	D6.8	**Name**	Mid-term Implementation Report on Stakeholder Engagement		
Work package	**Number**	WP6	**Name**	Communication, Dissemination and Engagement		
Date of delivery	**Contractual**		M15	**Actual**	12.05.2017	
Status	Final					
Nature	Report					
Distribution Type	Public					
Authoring Partner	IBEC					
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Project Information

This document is part of a research project funded under the **European Union Horizon 2020 Programme - Coordination and Support Action.**

Call Identifier: SC5-18b-2015, Integrating North African, Middle East and Balkan Earth Observation capacities in GEOSS.

Project GA number: 690133

Project Title: GEO-CRADLE - Coordinating and integRating state-of-the-art Earth Observation Activities in the regions of North Africa, Middle East, and Balkans and Developing Links with GEO related initiatives towards GEOSS.

Project Beneficiaries:

ID	Participant Organisation Name	Country	Logo
1	National Observatory of Athens (NOA) - **Coordinator**	Greece	
2	Interbalkan Environment Center (IBEC)	Greece	
3	Center for Environment and development for the Arab Region and Europe (CEDARE)	Egypt	
4	Research and Studies Telecommunications Centre (CERT)	Tunisia	
5	Tel Aviv University (TAU)	Israel	
6	Cyprus University of Technology (CUT)	Cyprus	
7	TUBITAK UZAY Space Technologies Research Institute (UZAY)	Turkey	
8	Space research and technology institute (SRTI)	Bulgaria	
9	National Institute of R&D for Optoelectronics (INOE)	Romania	
10	University of Ss Cyril and Methodius (USCM)	FYROM	
11	Institute for Nature Conservation in Albania (INCA)	Albania	
12	Institute of Physics Belgrade (IPB)	Serbia	
13	CIMA Research Foundation (CIMA)	Italy	
14	Academy of Athens (AOA)	Greece	
15	INOSENS (INS)	Serbia	
16	European Association of Remote Sensing Companies (EARSC)	EU	
17	EURISY	EU	
18	EuroGeoSurveys (EGS)	EU	
19	World Radiation Center (PMOD/WRC)*	Switzerland	

*Note: Switzerland is not requesting financial contribution from the EC

Executive Summary

This deliverable, entitled D6.8 “Mid-term Implementation Report on Stakeholder Engagement”, provides an overview of the outputs resulting from the actions performed under the task T6.3 “Stakeholder Engagement” (led by IBEC & CEDARE), up until M15. The majority of the work presented here is directly relevant to tasks T6.1 “Communication strategy and tools”, (led by NOA) and T6.2 “Dissemination”, (led by EURISY).

The document is structured as follows:

- The first part introduces the purpose and context of the engagement actions.
- The second part provides an overview of the first 15-month period actions in order to document the progress and potential refinements with regards to the engagement strategy.
- The third part highlights the project’s impact in terms of key performance indicators (KPIs) and key successes
- The fourth part highlights how the stakeholder engagement strategy can be improved until the end of the project.

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Acronyms and Abbreviations

Acronym	Description
CEOS	Committee on Earth Observation Satellites
EC	European Commission
EO	Earth Observation
FAO	Food and Agriculture Organization of the United Nations
GEO	Group on Earth Observation
GEOGLAM	Global Agricultural Monitoring Initiative
GEOGLAM-RAPP	Global Agricultural Monitoring Initiative / Rangeland and Pasture Productivity
GEOSS	Global Earth Observation System of Systems
INCA	Institute for Nature Conservation in Albania
ISRIC	International Soil Reference and Information Centre
JRC	Joint Research Center
KPI	Key Performance Indicator
MENA	Middle East and North Africa Region
PC	Project Coordinator
QC	Quality Control
RoI	Region of Interest
SDGs	Sustainable Development Goals
SME	Small and Medium enterprise
WP	Work Package

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1. Introduction

1.1 Purpose and Context

The GEO-CRADLE Stakeholder Engagement Strategic Plan (D6.5) focussed on issues, needs and means that are fundamental to the engagement of the complete ecosystem of EO stakeholders. Taking this into account, the current document presents an update in line with the progress of stakeholder engagement as the project's activities unfold, during the first half of the project's life.

In this line, the GEO-CRADLE consortium has adopted and implemented an inclusive stakeholder engagement strategy supported by the coordination team consisting of NOA and the regional coordinators from Balkan (IBEC) and MENA (CEDARE) regions in order to achieve tangible results. The engagement of key stakeholders (end-users and companies) has been strongly supported by the involvement of GEO-CRADLE champions and multipliers namely EURISY and EARSC.

Mechanisms and tools for engagement, such as, to name a few examples, workshops, meetings, networking actions, have promoted engagement processes focused on the main stakeholder target groups (Table 3-2 D6.5), and taking into account their needs as they were highlighted in the framework of the T2.5 "User Need Analysis" (see here). The stakeholder engagement actions aforementioned were interlinked with the majority of the project's activities and deliverables. Hence, much of the work presented here is also directly relevant to, and analysed in detail in D1.4 "Liaison strategy and targets (II)", D1.5 "Regional Coordination Progress Report (I)", D6.6 "Mid-term Report on Communication Strategy and Action activities" and D6.7 "Mid-term Report on Dissemination Activities". Further details on the deliverables are available on the GEO-CRADLE web page.

In order to engage the complete ecosystem of stakeholders across the Earth Observation (EO) the quadruple helix model (academia-industry-government-community) has been adopted and various engagement objectives have been considered:

- Inform and consult the public service bodies by inviting them to events and raising awareness with regards to pilot activities and overall project progress.
- Maintain an open "communication channel" with relevant stakeholders in any substantial way.
- Carry out regular engagement with national governments and public agencies, maintain high level communication in support of GEO-CRADLE's vision.
- Build up structured dialogue with commercial companies towards ensuring their optimal involvement in project and post-project activities.

- Provide regular information and consultation to Small and Medium Enterprises (SMEs), end users and citizens by highlighting how GEO-CRADLE helps to deliver EO-based benefits at local and regional level.

It should be noted that, the selection of the objectives depends on the stage of maturity in the engagement process and capacities of the engaging stakeholder.

In order to achieve the specific engagement objectives aforementioned, and ultimately fulfil the overall objectives of the stakeholder engagement strategy, GEO-CRADLE followed a **three-tier approach**, to ensure consistent and sustained engagement across the whole spectrum of targeted stakeholders in the Region of Interest (RoI) and beyond (Figure 1). Thus, the actions and mechanisms implemented followed a "**Sustain, Enhance and Expand**" rationale, with an overarching objective to cover the whole breadth of engagement activities, sustain and enhance existing engagement activities, and boost the establishment of new links with the stakeholder groups.

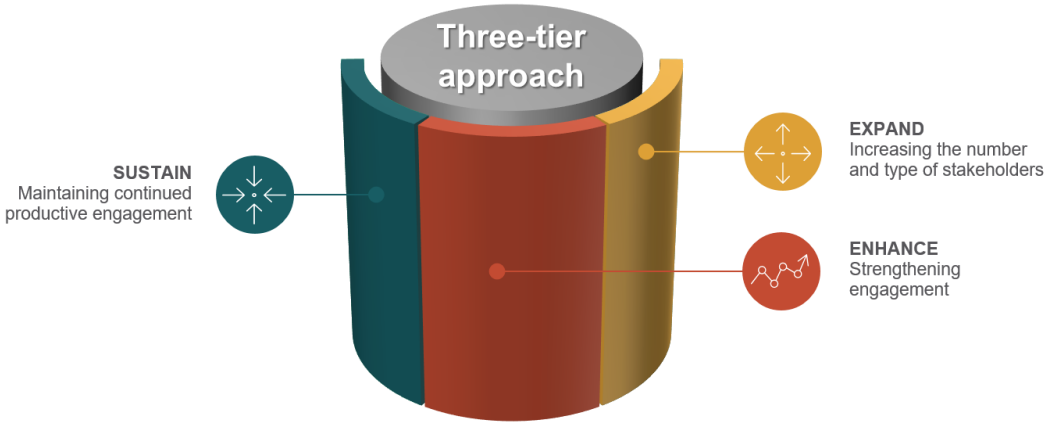

Figure 1: GEO-CRADLE "Sustain - Enhance - Expand" approach for engagement

Actions under the tier ("**Sustain**") focus on maintaining continued productive engagement with those stakeholders groups already active in GEO-CRADLE. In this line GEO-CRADLE, evaluates the current mechanisms and tools for communication and engagement and identifies "findings" and "lessons learnt" that contribute to the overall engagement, in order to utilize best practices and sharpen means for engagement.

Actions corresponding to the tier ("**Enhance**") aim at enhancing engagement with current stakeholders (and partners) across the entire EO value chain that are not sufficiently participating. GEO-CRADLE promotes specific activities (both internal and external) to boost full engagement.

A third tier ("**Expand**") includes actions aiming at raising the number of key stakeholders in the RoI, as well as at worldwide level.

2. Implementation of the Engagement Strategy

The mechanisms presented in this section follow an "**Engage, Advocate and Deliver**" logic, as outlined in the Strategic Stakeholder Engagement Plan, aiming at covering the whole breadth of engagement activities across the complete EO value chain as illustrated in the section “Detailed definition of stakeholder groups”.

Based on the work carried out to date (M15), and as demonstrated by the outputs presented in this document, the objectives of the engagement strategy have been met, sufficiently (Figure 2**Error! Reference source not found.**). The section below describes the actions related to the stakeholder engagement strategy for the first year of the GEO-CRADLE project, and it is structured as follows: i) Cataloguing the EO stakeholders, ii) Actions to engage stakeholders and advocate the importance of GEO-CRADLE, and iii) Support Actions.

Figure 2: Four pillars of GEO-CRADLE Engagement

2.1 Cataloguing the EO stakeholders

The mapping of stakeholders across the EO value chain and an analysis of the specific end-user requirements vis-à-vis EO services was performed in the context of T2.4 “User Need Analysis”. The GEO-CRADLE survey of the regional EO capacities constitutes a complementary effort to map stakeholders. The stakeholder map (Figure 3) summarizes the framework of GEO-CRADLE stakeholders representing different interests and the EO ecosystem in general, with whom the GEO-CRADLE engaged, considering needs and expectations as well as integrating them (and the survey results) into the means for efficient contribution of stakeholders to GEO, GEOSS and Copernicus. GEO-CRADLE engaged 236 entities from 26 different countries. It should be noted that each stakeholder could belong to more than one of the following categories: i) Raw data/provider, ii) Value-adder(data process-modelling), iii) GIS/mapping service provider, and iv) End User or End User with in house GIS/ mapping capabilities.

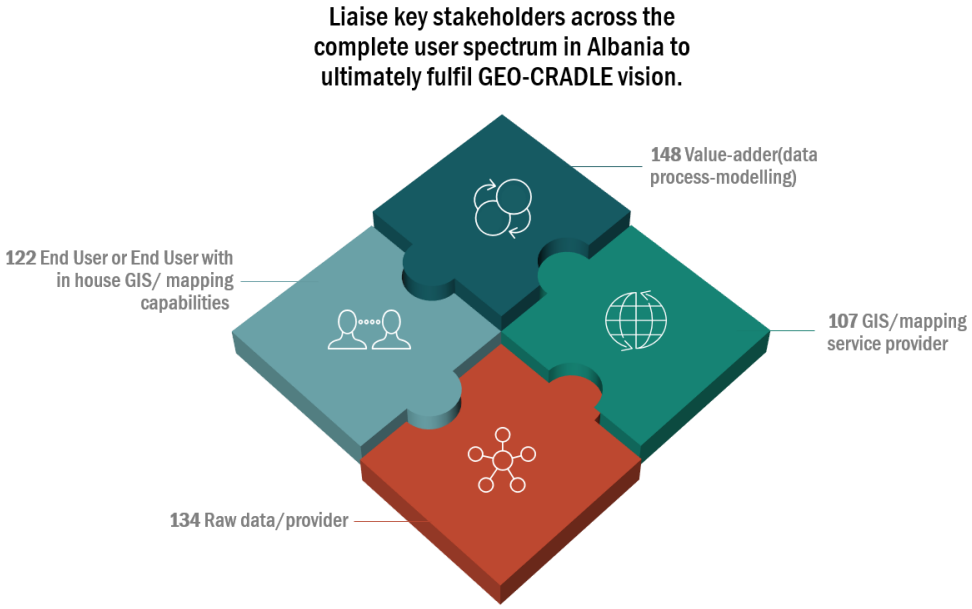

Figure 3: Stakeholder groups in the GEO-CRADLE ecosystem

2.2 Actions to engage stakeholders and advocate the importance of GEO-CRADLE

2.2.1 Engagement tools and mechanisms

Underpinning the engagement objectives, the development of smart and efficient networking tools contributed to the outreach to an audience across the complete EO ecosystem, in order to foster the engagement activities. These include:

- The development and use of a GEO-CRADLE Networking Platform;
- The presence of GEO-CRADLE in social media (e.g. Twitter, Facebook, LinkedIn);
- An up-to-date, attractive and usable website; and
- The production of a GEO-CRADLE quarterly electronic newsletter.

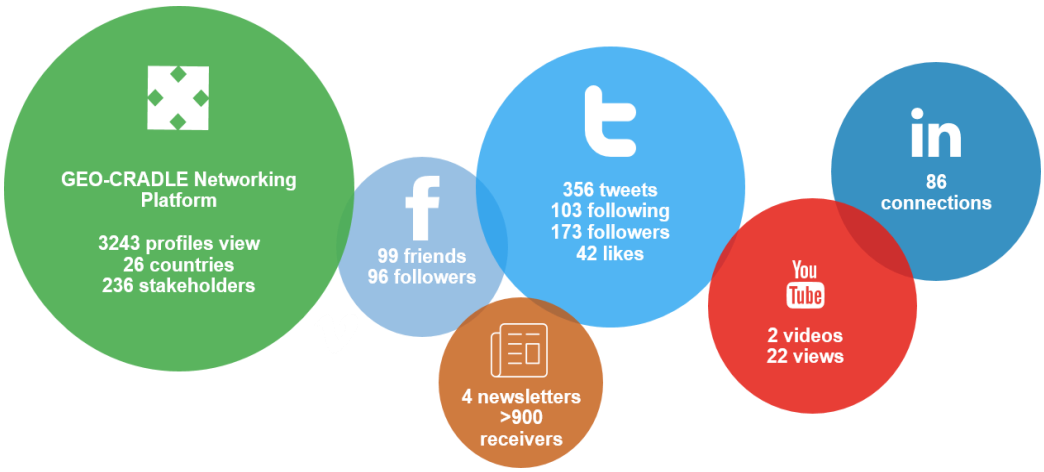

Figure 4: GEO-CRADLE's networking tools impact on engagement strategy

GEO-CRADLE Networking Platform

From month 6 onwards, the stakeholders could be informed on existing capacities, complementary skills and collaboration opportunities with regards to EO in the RoI by utilizing an attractive and user-friendly GEO-CRADLE Networking Platform (Figure 5). The consortium's aspiration is that the Networking Platform in conjunction with the Regional Data Hub act as the cornerstones for promoting better sharing of information and knowledge amongst EO stakeholders in the RoI.

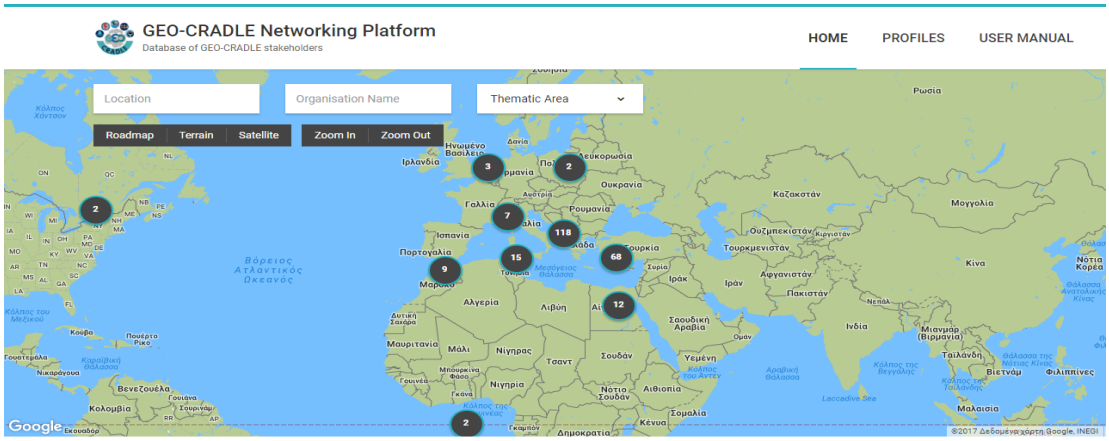

Figure 5: GEO-CRADLE Networking Platform

In this line, the platform facilitated the establishment of an extensive network of regional and global stakeholders to achieve extended participation of EO players wishing to join forces towards realising GEOSS in the RoI. It brought together **236 stakeholders from 26 different countries**. The stakeholders represent the private sector, the academic and civil society, public authorities and international organizations.

Social Media Presence

The utilization of social media, mostly Facebook and Twitter, aimed at building an EO community around the project, facilitating interaction among partners and stakeholders. Social media have been used mainly to publicize events and attract participants and to stimulate conversation on EO-related policies. Detailed description of social media actions can be found in the deliverable D6.6: Mid-term Report on Communication Strategy and Action activities and in the deliverable D6.7: Mid-term Report on Dissemination Activities.

Website

A dedicated website for dissemination and communication purposes has been produced at the beginning of GEO-CRADLE and has been updated throughout the project's lifetime, including updated information about the project, news, events, and downloadable material. The website is linked from and to the partners' web-site and relevant scientific communities and due to the **multilingual consortium is**

translated in three languages (English, Serbian and Arabic). Detailed description of the website can be found in the deliverable D6.2: GEO-CRADLE website.

e- Newsletter

A monthly e-mail communication schedule was followed, where the regional partners were contacted regarding matters concerning the promotion and implementation of EO-related projects in the region.

2.2.2 Stakeholder meetings and workshops

The GEO-CRADLE stakeholder meetings and workshops aimed to strengthen stakeholder engagement and exchange ideas with key institutions and organizations during the first half of the project. The meeting and workshop concept included introductory presentations on EO from research, industry, and civil society perspectives as well as the objectives of the GEO-CRADLE. Furthermore, the consortium supported the dialogue among the participants with regards to applications and innovations in order to address the specific challenges as presented in the GEO-CRADLE Feasibility Studies, and beyond. Furthermore, meetings and workshops were carried out to inform potential stakeholders outside the consortium and receive feedback, input and direction at strategic points. Moreover, the organization of these regional activities aimed at introducing EO solutions among the public and private stakeholders with regards to their national and regional needs, facilitating the development and implementation of a capacity building programme for the adoption of EO. To that end, three workshops and six meetings were organised in ten different countries (Figure 6).

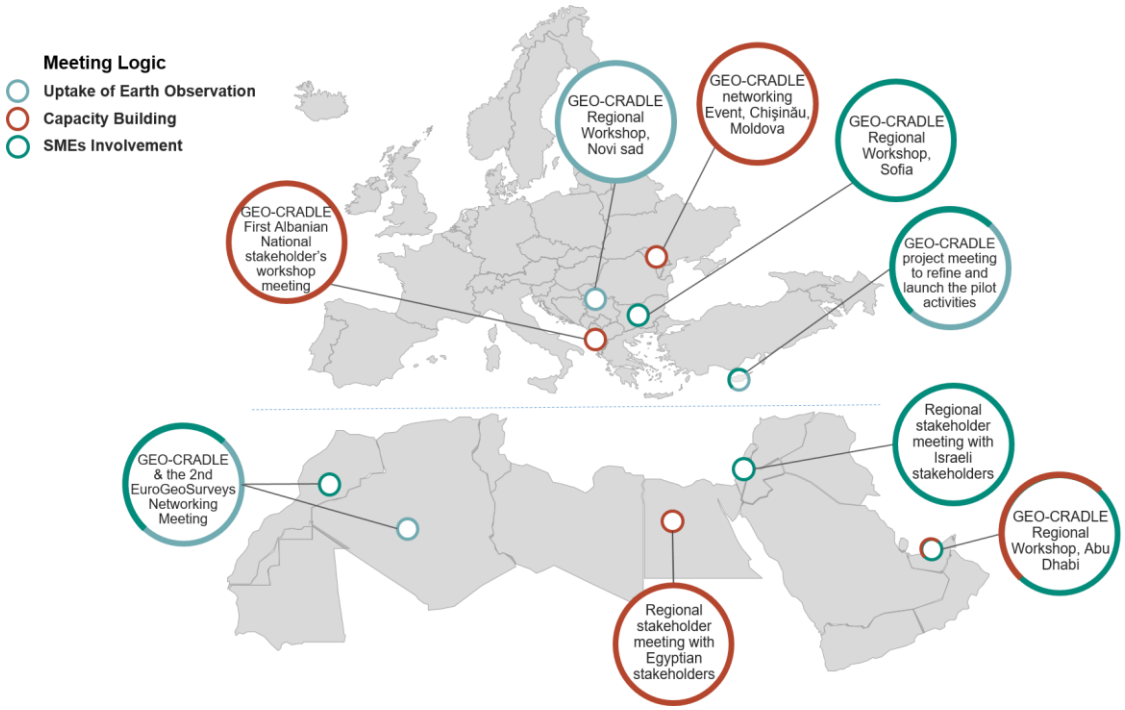

Figure 6: GEO-CRADLE workshops and meeting

In order to ensure a coherent presentation process, meetings and workshops are described in this section according to the following items:

- Objective of the meeting or workshop, linked to the relevant engagement levels (inform, consult, involve, collaborate and empower), as they are described in the Stakeholder Engagement Strategic Plan ;
- Relevant tier in the GEO-CRADLE engagement approach (see **Section 1.1**);
- Target stakeholders;
- Outcomes and Findings.

"The overarching objective of the GEO-CRADLE project is to create a multi-regional (Balkans, N. Africa and Middle East) coordination network, supporting the effective integration of EO capacities, providing the interface for the engagement of the complete ecosystem of EO stakeholders, promoting the uptake of EO services and data in response to regional needs and, finally, contributing to the implementation of GEOSS and Copernicus in the RoI."

In view of the overarching objective aforementioned the GEO-CRADLE defined specific objectives that also governed the stakeholder engagement activities carried out in the project. Therefore, this section is structured according to the following logic:

Uptake of Earth Observation: GEO-CRADLE places special focus on the uptake of EO services and data as a means for the effective response to regional challenges of common interest.

Capacity Building: GEO-CRADLE proposes solutions/methodologies to strengthen EO ecosystem's knowledge and capabilities, focused on three pillars: infrastructure, human capital, and organisational.

SMEs and users' Involvement: GEO-CRADLE aims at creating a network that will enable the engagement of stakeholders across the complete EO commercial domain.

2.2.2.1 Uptake of Earth Observation

GEO-CRADLE & the 2nd EuroGeoSurveys Networking Meeting	
Engagement Level	**Tier Approach**
Inform, Collaborate	Expand
Objective	
This networking meeting was held from **17-23 October 2016** in Morocco by the hosting partner EGS and the project coordinator NOA (Figure 7), aimed at engaging the complete EO ecosystem at regional level.	
Findings and Outcomes	
The event in Morocco further increased the stakeholders' engagement in the region, bringing together high-level Ministerial officers, Geological Surveys representatives, coordinators of regional initiatives and networks, relevant professors, scientists and researchers, local and regional in-situ network operators and EO-related companies. The main outcomes and findings of these networking meetings presented below: Provided project partners and stakeholders with valuable knowledge on the identified regional EO capacities and skills in the domain of access to raw materials Provided opportunities to exchange know-how and information taking into account the needs and shared best practices in using EO services to facilitate access to raw materials, in support of the roadmap's development, including solutions to improve innovation in the geo-information sector. Focused on the importance of capacity building and of enhancing EO knowledge and skills in the African continent.	

Figure 7: GEO-CRADLE networking actions in Morocco

GEO-CRADLE Project Meeting to refine & launch the pilot activities

Engagement Level	Tier Approach
Inform, Consult, Involve	Sustain, Enhance, Expand

Objective

The objective of the GEO-CRADLE project meeting which took place on **17 November 2016 in Limassol, Cyprus** (
Figure 8), was to discuss in detail and take the final decisions on the proposed refined scope of the pilot activities (WP4) on the basis of the gap analysis (WP3) and other

Findings and Outcomes

The workshop was well attended and brought together a critical mass of leading EO players in the RoI, combining a wealth of experience in GEO-related activities and proven scientific excellence. There were about 60 participants, engaging the complete EO ecosystem and attended in the four parallel sessions: i) Water Extremes Management ii) Access to solar energy, iii) Adaptation to climate change, and iv) Soil spectral data.

The main outcome could be summarized as the establishment of a common agreement and understanding among the partners on the specific contents, methodologies and expected outputs of the pilots.

Concerning the stakeholders' partners underlined the need to build GEO-CRADLE network, providing value to stakeholders via the portal and other activities, to have strong contribution of Regional Coordinators (IBEC & CEDARE). Furthermore, the participants concluded that it is urged partners to continue and enhance the stakeholders' engagement, the promotion of the GEO-CRADLE survey and network, the participation in and the organization of the proposed and even additional workshops in the different countries, also taking the opportunity in several cases to link to other events in the RoI (e.g. already scheduled meetings and conferences).

Figure 8: GEO-CRADLE project meeting in Limassol

2.2.2.2 Capacity Building

Regional stakeholder meeting with Egyptian stakeholders

Engagement Level	Tier Approach
Inform, Involve, Collaborate, Empower	Expand

Objective

This workshop convened on **28 April 2016 in Cairo, Egypt** (Figure 9). The main purpose of this meeting was to carry out regular engagement with relevant political authorities and other stakeholders at national and regional level, in support of the delivery of the GEO-CRADLE objectives and vision.

Findings and Outcomes

The workshop was well attended. There were about 80 participants, representing the complete EO ecosystem (e.g. scientists, researchers and policy makers interested in environmental issues). Relevant EU political authorities participated, for example, Mr. Janis Aizsalniek, European Union EU representative in Egypt, while from national perspective the Deputy Minister of Planning for Monitoring and Follow up of the administrative reform, responsible for monitoring of the implementation of Egypt's vision 2030 to achieve sustainable development, Dr. Nehal Magraby, was present.
The participants concluded that GEO-CRADLE provides significant contribution to monitor and track earth climate changes and facilitates the prediction and mitigation of future consequences of climate changes. Finally, cooperation and participatory approach in the field of EO data operation is becoming an urgent need and fundamental requirement in order to address environmental threats and avoid their devastating impact on health, environmental, economic and social aspects.

Figure 9: Participants from regional stakeholders meeting in Cairo

GEO-CRADLE 1st Albanian National stakeholder's workshop meeting

Engagement Level	Tier Approach
Inform, Consult, Involve, Collaborate, Empower	Expand

Objective

The meeting convened on **26 September 2016 in Tirana, Albania** (Figure 10). The meeting focussed on the **establishment of an Albanian national network of key stakeholders**. To that end, INCA staff presented to the audience the milestones of the GEO-CRADLE project and the advantages it will bring to the Albanian stakeholders network in terms of enabling the actors involved to identify capacity needs and to be engaged in regional and wider cooperation in the implementation of GEOSS.

Findings and Outcomes

The one-day meeting was attended by **25 participants from different public institutions** (the Ministry of Agriculture, Ministry of Environment, National Agency for Nature Resources, National Agency of Protected Areas, National Agency of Territory Planning, National Authority for Food, Albanian Energy Corporation, the State Authority for Geospatial Information, Universities, etc).
Valuable input was given, such as the **evaluation of the existing EO capacities** in Albania. Furthermore, GEO-CRADLE was considered as a very significant project in terms of Earth Observation; however it was indicated as **very ambitious for the Albanian situation**. In this line, the Albanian participants expressed their will to collaborate in providing existing data, skills, gaps and complementarities, necessary for the development of synergies in relation to national priorities in order to enhance the country's capacity.

Figure 10: Participants from Albanian National stakeholder's meeting in Tirana

GEO-CRADLE networking event, Chișinău, Moldova

Engagement Level	Tier Approach
Inform, Involve, Collaborate	Expand

Objective

This meeting convened on **3 January 2017 in Chișinău, Moldova** (Figure 11). The main objective was to foster regional cooperation and integration of monitoring capabilities, networks, and scientific skills in the direction of a roadmap for GEO and Copernicus implementation in North Africa, Middle East and Balkans. In this line, a series of networking events performed in countries that belong in the region of interest of GEO-CRADLE.

Findings and Outcomes

In the context of this effort, the NOA presented to the State Hydrometeorological Service (SHS) of the Republic of Moldova the project's objectives, current activities and expected outcomes, identified the EO capacities and discussed the relevant needs of SHS and Moldova, and finally explored the possibilities for cooperation and future perspectives.
The main outcomes and results from this event are summarized below:

- SHS agreed to join the GEO-CRADLE Regional Networking Platform and follow the activities of the project, with dissemination to other relevant stakeholders in the country.
- SHS representatives will participate in forthcoming regional workshops and in the meeting where the pilots' outcomes will be presented, in order to provide feedback and exploit the results adapted to their own needs and interests.
- SHS expressed its interest in Copernicus data and relays
- The participants identified common needs, shared capacities and created synergies.

Figure 11: GEO-CRADLE networking Event in Moldova

GEO-CRADLE Regional Workshop, Abu Dhabi

Engagement Level	Tier Approach
Inform, Consult, Involve, Collaborate	Sustain, Enhance, Expand

Objective

The workshop held on **2 February 2017 in Abu Dhabi** (Figure 12), aiming to support knowledge sharing and an enhanced cooperation between academia and industry, the event will also provide participants with a unique cross-sector networking opportunity.

Findings and Outcomes

The workshop brought together scientific community to discuss how EO could address important societal challenges.
An important discussion was around how public stakeholders could be involved in the GEO-CRADLE project. Some of the participants expressed interest in participating in consultation phases, regional workshops and in the meeting where the pilots' outcomes will be presented, in order to provide feedback and exploit the results adapted to their own needs and interests. This engagement was perceived to be an important step for future cooperation. In addition, participants were interested in the Scientific Data Hub and agreed to join the Regional Networking Platform. However, the need for a tighter link between stakeholders, end users, and developers was acknowledged.

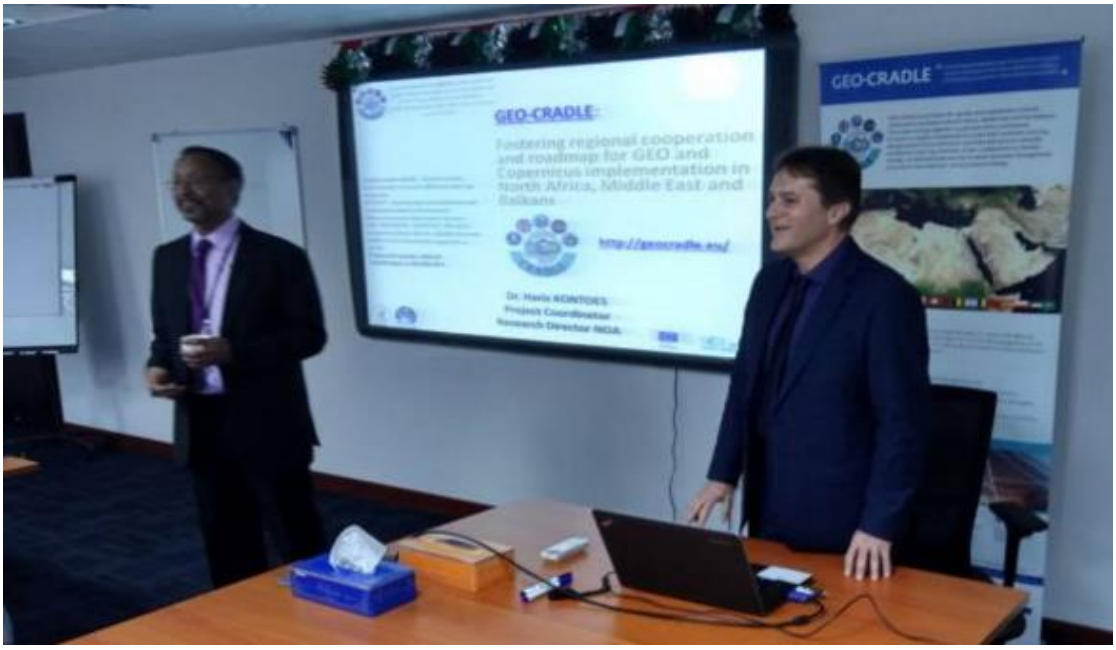

Figure 12: Project Coordinator (NOA) and UUAE partner in Abu Dhabi Meeting

2.2.2.3 SMEs and users' Involvement

GEO-CRADLE Regional Workshop, Novi Sad	
Engagement Level	Tier Approach
Inform, Consult, Involve, Collaborate	Sustain, Enhance, Expand
Objective	
This GEO-CRADLE Regional Workshop was held **from 14 - 15 July 2016 in Novi Sad** (Figure 13). The event aimed to connect the dots across the Earth Observation value chain, by providing the ground for key players from public sector, academia and innovative SMEs to consider challenges, opportunities, and new approaches in EO on a regional scale.	
Findings and Outcomes	
This workshop brought experts from the countries of the Balkan region to better understand the EO capacities in a scientific and commercial perspective by sharing respective knowledge, challenges and opportunities to achieve EO adaptation in that specific region. In this line, the discussions included both confirmed and potential users of geo-information services, promoted knowledge transfer and cross-sector fertilization of good practices in the energy, climate change, food security and access to raw material sectors. Furthermore, the workshop presented the existing incubators and funding opportunities for start-ups and SMEs interested in using geo-information. It also aimed to build a professional network between the participants to promote further active engagement on cross-sectoral integration and the thematic priorities of GEO-CRADLE project.	

Figure 13: The GEO-CRADLE regional Workshop in Novi Sad

GEO-CRADLE & the 2nd EuroGeoSurveys Networking Meeting

Engagement Level	Tier Approach
Inform, Collaborate	Sustain, Enhance, Expand

Objective

The Networking meeting held on **19 October 2016**, **in Timimoun, Algeria** (Figure 14). The proect aimed at providing opportunities to exchange information and share best practices in utilizing EO services to facilitate raw materials in order to identify the roadmap with solutions to improve innovation in the Geo-information domain.

Findings and Outcomes

The heads and managers of all the main Algerian state-enterprises attended the meeting. Moreover, the networking action brought together a critical mass of EO stakeholders in the domain of geological science namely the EGS Secretary General, Mr. Luca Demicheli, the EGS Office Manager, Ms. Céline Andrien, the Chair of the International Cooperation and Development Task Force, Mr. Marek Graniczny and the deputy chair of the EGS Earth Observation and GeoHazards Expert Group, Ms. Veronika Kopackova.
The meeting in Algeria was attended by over 200 participants representing the whole Algerian geo-scientific community, mainly from universities and governmental institutions at the highest levels. The reaction was overwhelmingly positive and, besides the many questions posed by the audience, several cooperation proposals were discussed. Also, Tunisia was represented at Director General Level.

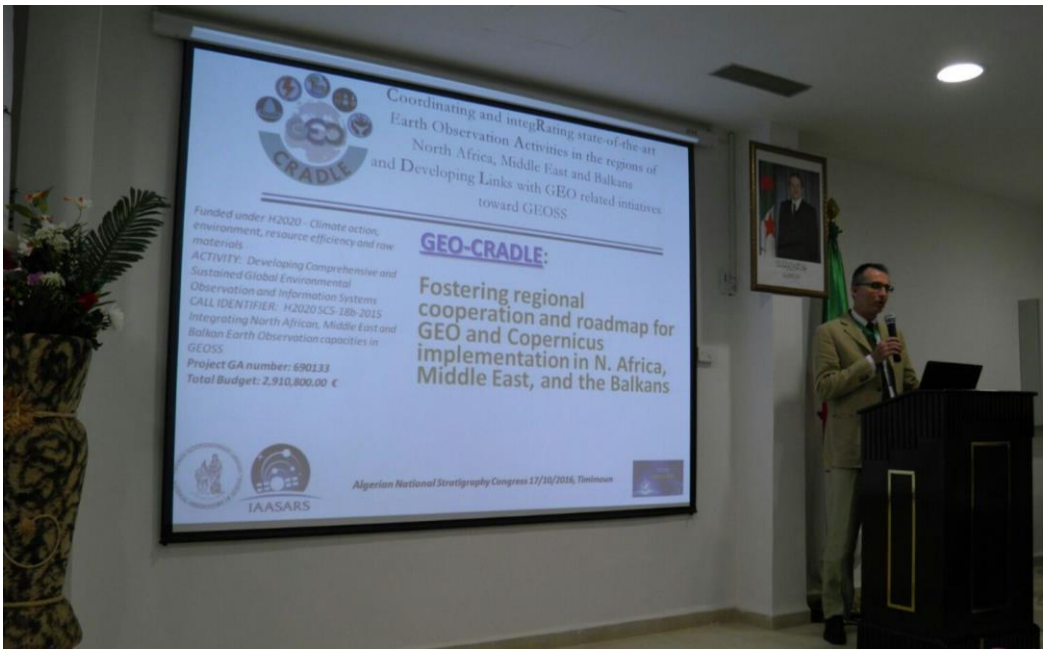

Figure 14: EGS Secretary General, presenting the GEO-CRADLE project in Algeria

GEO-CRADLE project meeting to refine & launch the pilot activities

Engagement Level	Tier Approach
Inform, Consult, Involve	Enhance, Expand

Objective

The **GEO-CRADLE meeting in Limassol, Cyprus 16-17/11/2017** aimed to further engaged with the relevant regional stakeholders (data/service providers and SMEs) through the parallel session (Soil spectral data), in order to identify the regional needs taking into account the recent trends in the domain of EO.

Findings and Outcomes

Leading Companies in the EO domain (SPECIM) and end users (Golan Heights Winery) introduced applications or products they are developing, addressing especially their possible contribution to GEO-CRADLE pilot studies (). In moderated dialogue actions, the participants discussed the applications as well as their desired fields and forms of innovation with the technology developers.

Figure 15: SPECIM presentation for hyperspectral data and sensors

Regional stakeholder meeting with Israeli stakeholders

Engagement Level	Tier Approach
Inform, Involve	Sustain, Expand

Objective

This meeting convened on **31 January 2017 in Tel Aviv** the same day with 12th Ilan Ramon Conference on EO applications for the Mediterranean Sea and industrial engagement organised by COSMOS (Horizon 2020 Space NCP Project). The aim was to exchange ideas and inform participants across the Mediterranean region, about activities undertaken in the context of GEO-CRADLE.

Findings and Outcomes

The discussions with the participants (Israeli Space Agency, Commercial EO players from Greece and Israel) indicated that a clarification of the targeted users of GEO-CRADLE outcomes is needed. Therefore, it was proposed to provide a clear guidance for the different stakeholders, such as “professional” users (e.g. EO users and developers, researchers etc.), and “interested” users with limited technical capabilities/skills and EO background knowledge.

GEO-CRADLE Regional Workshop, Abu Dhabi

Engagement Level	Tier Approach
Inform, Consult, Involve, Collaborate	Sustain, Enhance, Expand

Objective

The workshop was held on **2 February 2017 in Abu Dhabi** (Figure 16). This regional workshop aimed at identifying the potential local challenges hindering the EO market uptake and business performances, while seeking solutions to enhance growth and innovation in the geo-information sector.

Findings and Outcomes

The workshop brought together GEO-CRADLE partners and technology developers to discuss how EO could boost the commercial sector.
The discussion at the roundtable in Abu Dhabi highlighted the need for more education, technical support and capacity building on EO data exploitation, combination with in-situ data and integration in models. The private sector companies highlighted the importance of open and free access to data, and the need to establish a National Spatial Data Infrastructure.

Figure 16: Participants from GEO-CRADLE Regional Workshop in Abu Dhabi

GEO-CRADLE Regional Workshop, Sofia

Engagement Level	Tier Approach
Inform, Consult, Involve	Sustain, Enhance, Expand

Objective

This workshop convened **on 24 March 2017 in Sofia, Bulgaria** (Figure 17). The workshop brought together players from research and industry domain to discuss how EO could address important societal challenges.

Findings and Outcomes

The main outcomes and findings of this workshop include *inter alia*:

- Local companies and research organisations introduced products that they are developing, addressing especially their possible contribution to several sectors, such as urban development and agriculture. The participants discussed the proposed solutions and the desired results and forms of innovation with the public bodies and academic community.
- Funding schemes need to be shifted to allow for more opportunities to talk with targeted stakeholders.
- Participants were interested in the Scientific Data Hub and agreed to join the Regional Networking Platform.

Figure 17: GEO-CRADLE Regional Workshop in Sofia

A brief overview of all the regional stakeholder meetings and workshops undertaken within the first 15 months of the project's lifetime is presented in Table 1 as well as online in the Events Corner.

Table 1: GEO-CRADLE workshops and meetings

Date	Title	Main Stakeholder (Host and Location)	Main points
28/4/2016	Regional stakeholder meeting with Egyptian stakeholders Report	Ministries of Electricity, Environment, Water Resources and Agriculture etc. (CEDARE, Cairo)	▪ The event was held back to back with R-KNOW[1] project national policy workshop ▪ Strengthening the application of systematic approaches to water management in 5 countries of MENA region
14-15/7/2016	GEO-CRADLE Regional Workshop, Novi sad Minutes	Private and public stakeholders (INS, Novi sad)	▪ Presentation of existing incubators dealing with geo-information ▪ Engage regional players
26/9/2016	GEO-CRADLE First Albanian National stakeholder's workshop meeting Agenda	Ministry of Economic Development, Tourism, Trade and Entrepreneurship, and Ministry of Environment etc (INCA, Tirana)	▪ 25 participants from different potential public institutions ▪ Establishment of an Albanian national network of key stakeholders ▪ Fill the online survey and the questionnaires for the evaluation of the existing EO capacities ▪ Common conclusion that GEO-CRADLE is very ambitious for the Albanian situation
17-23/10/2016	GEO-CRADLE & the 2nd EuroGeoSurveys Networking	Academia and Industry	▪ State-enterprises attended the meeting
	Meeting Minutes	(EGS, Morocco & Algeria)	▪ Critical mass of EO stakeholders (>200) in the field of EO and geology

[1] R-KNOW: The Regional Knowledge Network on Water, link: http://www.rknow.net/index.php/en/

16-17/11/2016	GEO-CRADLE project meeting to refine and launch the pilot activities	Academia and Industry (CUT, Limassol)	▪ Presentation of data services providers, decision makers and SMEs
	Minutes 1st day Minutes 2nd day		▪ Final decisions on the proposed refined scope and discussion among stakeholders with proven scientific excellence
3/1/2017	GEO-CRADLE networking Event, Chişinău, Moldova Minutes	Public Authorities (SHS, Chişinău)	▪ Identify local challenges ▪ Foster link for future cooperation
31/1/2017	Regional stakeholder meeting with Israeli stakeholders	Israeli SMEs, Israel Space Agency (TAU, Tel Aviv)	▪ Engage industrial key players in transnational level
2/2/2017	GEO-CRADLE Regional Workshop, Abu Dhabi	Public Authorities, Academia, Industry (UAEU, Abu Dhabi)	▪ Identify local challenges hindering the EO market place
	Minutes		▪ Foster link for future cooperation Enhance cooperation between academia and industry
24/3/2017	GEO-CRADLE Regional Workshop, Sofia Agenda	Public Authorities, Academia, Industry and NGOs (SRTI, Sofia)	▪ Enhance cooperation between academia and industry ▪ Funding schemes need to be shifted to allow for more opportunities to talk with targeted stakeholders

2.3 Support actions

The mission of GEO-CRADLE can only be achieved through a coherent engagement and a continuous interaction with stakeholder communities. In this context, the structured stakeholder engagement process (Engagement tools and mechanisms and Stakeholder meetings and workshops) supported by a series of supplementary actions that were not included in the initial strategic plan to expand and **formalize the relationships with other key EO players and high-level organizations.** In this line, it was decided to foster ongoing exchange with other EO projects, GEO initiatives and political stakeholders (Figure 18). Therefore, the current section describes the activities that have been undertaken related to stakeholder engagement strategy and it is structured as follows:

- Cooperation with other European projects and other activities
- Cooperation with GEO activities
- Internal Engagement and Capacity Building

Figure 18: GEO-CRADLE partners at various events around the world

2.3.1 Cooperation with other European projects and activities

GEO-CRADLE at ConnectinGEO Workshop on Gap Analysis and Prioritization, 10-11/10/2016, Laxenburg. GEO-CRADLE participated with a presentation (PC Haris Kontoes: The GAP Analysis process in the GEO-CRADLE project) to the workshop. It should be noted that, GEO-CRADLE shared with ConnectinGEO the objective of discovering gaps in European EO data, and therefore they have somehow a complementary work.

The 2016 EGM convened on 28-29 November 2016 in Seoul, Republic of Korea and organized by the United Nations Office for Sustainable Development (UNOSD) in collaboration with Sustainable Development Solutions Network (SDSN) Korea, Korean Ministry of Environment and Korea University. GEO-CRADLE coordinator (Dr.Haris Kontoes) gave a presentation entitled: "GEO-CRADLE: Fostering regional cooperation and roadmap for GEO and Copernicus implementation in N. Africa, Middle East, and the Balkans".

GEO-CRADLE Partner at the 9th GEOSS Asia-Pacific Symposium, 11-13/01/2017, Tokyo, Japan. Eyal Ben Dor, from the Tel Aviv University participated in the 9th GEOSS Asia-

Pacific Symposium in Japan by presenting the Israel GEO Activities and highlighting the GEO-CRADLE pilot activities in food security. The 9th Global Earth Observation System of Systems (GEOSS) Asia-Pacific Symposium was organised by the Group on Earth Observations (GEO) and the Ministry of Education, Culture, Sports, Science and Technology (MEXT) of Japan with 243 participants.

GEO-CRADLE in the Global Space Congress 31/01 - 1/02/2017, Abu Dhabi. GEO-CRADLE Coordinator Dr Haris Kontoes, participated in the Congress by delivering a presentation in the session "Earth Observation and Planetary Symposium" highlighting the importance of regional cooperation and roadmap development for GEO and Copernicus implementation in the RoI.

GEO-CRADLE at the Global Symposium on Soil Organic Carbon, held in the Food and Agriculture Organization of the United Nations (FAO) headquarters in Rome, 21/3-23/3/2017. Prof. Zalidis promoted the GEO-CRADLE project and particularly the need to develop a Balkan-MENA soil spectral library highlighting the importance of data harmonization among the world top leaders such as ISRIC, Global Soil Partnership, and CSIRO. IBEC will follow up this initiative in the forthcoming GSP Symposium under the session of "Harmonization of methods, measurements and indicators for the sustainable management and protection of soil resources".

GEO-CRADLE at the 3rd Ministerial Conference on Research Innovation and Higher Education, 30-31/03/ 2017, Tunis. The third Ministerial Conference aimed at strengthening partnerships in research, innovation and higher education to further stimulate economic growth, job creation and social cohesion in the Western Mediterranean region which is complementary with GEO-CRADLE actions.

The GEO-CRADLE project in the MEDCLIVAR 2016 Conference for improved adaptation to climate change. Project Coordinator Dr Haris Kontoes presented under the Session 2 on Tuesday 27/9 "The GEO-CRADLE Project: Integration of Earth Observation Activities in the Regions of North Africa, Middle East and Balkans, for improved adaptation to climate change".

2.3.2 Cooperation with GEO activities

GEO-CRADLE organized the session "Regional dimension for GEO and capacity building priorities", during the last GEO European Projects Workshop (Berlin, Germany, from 31 May to 2 June 2016).

GEO-CRADLE partners at GEO-XIII Plenary & Exhibition, 7-10/11/2016, St. Petersburg. GEO-CRADLE participated in the GEO-XIII Plenary and Exhibition 2016 a top event where GEO-CRADLE partners met in order to explore new opportunities for regional networking and contributions towards the implementation of GEO's and Copernicus' objective. In this line, IBEC held meetings with GEO's Secretariat Director Barbara Ryan in order to promote the incorporation of regional countries such as Albania, FYROM and Cyprus (which are all actively represented in GEO-CRADLE) to GEO.

GEO-CRADLE at the American Geological Union's Fall Meeting of 2016 (approximately 24000 participants), held in San Francisco, where the GEO-CRADLE project was presented as an exemplary project which promotes the uptake of state-of-the-art EO related activities in the Balkan and MENA region. IBEC held a meeting with GEOGLAM and GEOGLAM – RAPP initiatives in order to develop a proposal for the Balkans region (in Albania and Bulgaria), whose main objective is promoting the uptake of EO services in order to adopt an innovative solution for effective observation of essential variables with regards to sustainable upland and water use management and finally contributing to derive the indicators for monitoring and reporting progress towards Sustainable Development Goals (SDGs).

GEO-CRADLE was involved in the GEO SDG update report for the third meeting of IAEG-SDGs Working Group on Geospatial Information Kunming, China 8-10 May, 2017. The EO4SDGs is working with Committee on Earth Observation Satellites (CEOS), the regional coordinator of GEO-CRADLE (IBEC), and the Ministry of the Environment in Albania, among other key contributors, to promote the uptake of Earth observation services and data in response to national and regional needs, and tap into the full potential of EO for sustainable land (soil and water) management, to help maximize the provision of environmental services and the long-term achievement of relevant SDGs. To address some of these critical issues and ultimately optimize the use of satellite data, a project named "Coordinating Earth Observation Activities for Sustainable Land Management in Albania and the broader Balkan region" developed aiming at the development of the Albanian Data Cube, with the vision to eventually help develop a regional Data Cube for the Balkans. The World Bank Group are also involved in ongoing discussions.

An overview of all the GEO-CRADLE activities to connect with GEO is illustrated in the Figure 19.

Figure 19: GEO-CRADLE activities promoting the cooperation with GEO

2.3.3 Internal Engagement and Capacity Building

In the framework of the GEO-CRADLE Adaptation to Climate Change (ACC) pilot, NOA along with the network partners (INOE, CUT, PMOD/WRC) organized the PRE-TECT experimental campaign in order to run and validate the desert dust forecasting module of the pilot. Moreover, advanced ground-based radiation measurements will be used to evaluate the SENSE energy system for the determination of solar energy. The experiment has been undertaken during April 2017, aiming to advance the ACC and Energy GEO-CRADLE pilots.

Development of a proposal (April 2017) for the H2020 call SC5-18-2017: Novel in-situ observation systems, whose overarching objective is promoting the use of the latest developments in sensor science and novel technologies in support of the objectives of GEO-GLAM, taking into account observational gaps of the in-situ component of GEOSS and Copernicus, in less developed countries of the Balkan Peninsula. The proposal namely "IN situ solutions for monitoring of essential Variables through the integration of novel ICT technologies in a nexUS approach" builds on the knowledge of the current in-situ landscape in countries where food security has a strong impact, as acquired through the dedicated gap analysis carried in the region of interest within the GEO-CRADLE project (D3.1 Gap Analysis Report). Moreover, the proposal brought together several GEO-CRADLE partners (NOA, IBEC, INS, TAU, PMOD/WRC) to develop a novel integrated in situ driven observation approach which is in line with GEO-CRADLE objective to *pave the ground for a new large initiative or flagship project in this particular by all means region of the Balkans.*

GEO-CRADLE also promoted activities focused on sustaining productive engagement and improving engagement with partners that are not sufficiently participating. In this line, IBEC and TAU held a series of teleconferences and discussions to promote a coordinated collaboration among the partners in support of the Balkan-MENA soil spectral library. The exchanges among the partners deepened their understanding of soil ecosystem and EO capacities and further extent the soil, earth and environmental sciences towards operational applications. In this context, partners submitted and presented scientific publications, with a special focus in the promotion of the GEO-CRADLE project and its ongoing regional spectral library, in the Fifth International Conference on Remote Sensing and Geo-information of Environment, which was held in Cyprus and during the Global Symposium on Soil Organic Carbon, held in the FAO headquarters in Rome.

3. Evaluation of engagement strategy

3.1 Progress towards key performance indicators

To gain a more in-depth understanding of the project's impact, already at proposal stage and at the Stakeholder Engagement Strategic Plan (D6.5, Table 5-1), GEO-CRADLE has elaborated a preliminary list of KPIs to be monitored during and after its implementation that allow monitoring the impact of the engagement activities both in short-term and in long-term. In this context the progress of stakeholder engagement is presenting below in terms of selected KPIs:

	Target Range		
Title	T1	T2	Achieved
Regional/National workshops, technical meetings	7-10	15-20	8
Key decision makers engaged in GEO-CRADLE network	10-15	20-30	12
Spin-off and R&D projects built on GEO-CRADLE and its pilots	1-3	3-5	2
Private companies engagement to GEO-CRADLE	3-5	5-10	15
Regional EO actors profile available through GEO-CRADLE portal	50-60	100-150	236
Countries represented in GEO-CRADLE Network	14-15	20-25	26
Regional/National workshops, technical meetings			9
Website unique visits-Social media Traffic			6201
Champions/multipliers engaged			4
Country (G)EO Maturity Profiles			11
Experimental campaigns from which data will be integrated			2

Note: The KPIs that defined at proposal stage and those that defined during the Stakeholder Engagement Strategic Plan are illustrated with light blue and orange color, respectively.

3.2 Key Successes

The aim of this task was to highlight the role of a few strategic actions during the GEO-CRADLE that were aligned with political priorities at national level and with the capacities of the EO community at regional level, in support of GEO's vision.

In this context, a series of key success stories that brought together key stakeholders such as the agencies owning EO infrastructures and/or producing and distributing EO data and information, such as space agencies; government departments which need EO for drafting, implementing or monitoring national policies in the fields of environment or energy; and the Group on Earth Observations and International Financial Institutions.

High level Political Engagement

Prof. Hesham El-Askary of CEDARE has had important contribution to the engagement performing meetings with Mrs. Nabila Makram, Minister of Immigration and Egyptian Expatriates Affairs as well as Dr. Mohamed Shaker El-Markabi, Minister of Electricity and Renewable Energy (Figure 20). The main outputs of the actions aforementioned are summarized below:

- The thematic priority areas addressed by GEO-CRADLE related to climate change and energy, focusing on the extreme weather events and the impact of climatic factors on renewable energy presented in the national policy makers.
- The participants highlighted the importance of renewables and provided a number of priority parameters with respect to solar energy potential that can be addressed within the framework of the pilot activities. A prototype of the Solar Atlas of Egypt has been presented to the Egyptian authorities.

Figure 20: The GEO-CRALDE in high level engagement meetings

Roundtables with Space Agencies and Research Centers

Furthermore, a roundtable consisting of GEO-CRADLE partners and key stakeholders such as JRC (Luca Montanarella), European Space Agency (Ivan Petiteville) and Israeli Space Agency (Danny Barrock) was performed during the first day (Figure 21).

Figure 21: GEO-CRADLE roundtable in Limassol

The roundtable has sought to build up a high level stakeholder dialogue with sector-specific user communities, such as researchers and policy makers. The work of the GEO-CRADLE roundtable has also focused on improving the science-policy interface, e.g. by supporting policy relevant processes and transnational actions, by providing expertise and knowledge to participants.

GEO and International Financial Institutions Engagement

IBEC held meetings with GEO Secretariat in order to promote the incorporation of regional countries such as Albania, FYROM and Cyprus (which are all actively represented in GEO-CRADLE) to GEO. Moreover, IBEC performed a series of engagement activities with Albanian stakeholders to demonstrate the value of EO in decision making and to help advance the implementation of the SDGs at national level. The engagement of the World Bank should be highlighted during these preliminary discussions. Further, IBEC is planning to host a high-level meeting in June 2017 with participation from the regional ministries of agriculture, among other ministries, with a focus on promoting the development of this EO-focused, Balkan Initiative.

Level of Participation

The workshops, meeting and stakeholder engagement tools were evaluated positively by the large majority of participants. Public authorities gained a better perspective of Earth Observation capabilities. However, more roundtables should be organized in order to provide opportunities for mutual learning between researchers, service providers and policy makers.

4. GEO-CRADLE Engagement: The way ahead

4.1 Proposed actions to maximise impact

4.1.1 Organizing the workshops to coincide with other major events

A way to maximize the impact of the project is to ensure greater numbers of stakeholders engaged in the workshops. This can be achieved by organizing different regional workshops throughout the RoI. Additionally, if possible, the organizing committees should pursue the **co-organization of workshops alongside other major events** in the RoI, to attract as many interested parties as possible. Indisputably, if this is achieved, special care must be taken in order to avoid potential schedule conflicts.
The upcoming GEO-CRADLE workshops "GEO-CRADLE Industry Engagement Workshop", 26/04/2017, Brussels, "GEO-CRADLE Regional Workshop", 09/05/2017, Bucharest and "GEO-CRADLE Regional Workshop", 25/05/2017, Cairo aim to present current achievements and underline key priorities of GEO with regards to further engagement in the RoI (Figure 22). The forthcoming workshops and their objectives are presented below:

Figure 22: Location of upcoming GEO-CRADLE workshops

EARSC will organize a workshop (in parallel with another workshop on industrial engagement with the Copernicus Services) **on April 26** to discuss concrete ways for the improved industry involvement in the exploitation of Copernicus Services and the delivery of GEO vision. The session will underline the key priorities of GEO with regards

to industry engagement and, through the example of GEO-CRADLE, will provide a concrete account of tools that can help EU industry develop business in the Balkans, North Africa and Middle East. In this roundtables will be performed for reaching the highest possible level of adoption of produced solutions and early take-up.

CEDARE will organize a regional workshop "**GEO-CRADLE Regional Workshop", 25/05/2017, Cairo**, focussed on identifying the potential local challenges and needs that can be addressed with Earth Observation, enabling more informed decision making, while seeking solutions to enhance growth and innovation in the geo-information sector. Aiming to support knowledge sharing, capacity building and an enhanced cooperation between academia and industry, the event will also provide participants with a unique cross-sector networking opportunity. In addition, panel discussions will be complemented with information on available EU funding in the EO sector.

INOE will organize a regional workshop **"GEO-CRADLE Regional Workshop", 25/05/2017, Bucharest**, in order to focus on identifying the potential local challenges and needs that can be addressed with the Earth Observation.

4.1.2 Maximize the reach of the media and engage the citizens

An additional way to maximize the impact, is to extend the presence of GEO-CRADLE in the media (whether social or conventional). This will attract and engage regular citizens, who will be informed of the project's goals.

As far as social and electronic media are concerned, the following steps can be made in the future:

- Increase the number of followers / subscribers, and their engagement. Admittedly, this task can be quite substantial, but the following courses of actions can be taken:
  - ✓ Engage the users by asking questions, running a poll, use more relevant hashtags, use live coverage of events and more.
  - ✓ Alternate the posting schedule to attract followers attending the social media at different times or time zones.
  - ✓ Enhance the visual presence, by posting more images / photos / infographics instead of plain text.
- Promote the social media accounts more actively in the newsletter and all project events (for instance, in the previous newsletters, only small icons at the bottom of the page existed). Prioritizing their importance in all events will increase their use and attract more people to be active.
- Assess and use the strengths of each platform independently, without neglecting to refer to the central webpage (acting as a common ground and source of information).

On the other hand, different users have different habits and preferences. There is a distinct group of users that prefer conventional media (such as newspapers, radio and

the television) to be informed, and avoid the use of social media. Simultaneously, the needs and wants of this user group are substantially different from the ones of people relying on social media; the former prefer more in-depth information. In order to ensure that this group of users is informed of the project, and maximize the project's reach, the use of traditional media must be encouraged.

4.1.3 Maximize the presence of the scientific community

The dissemination and transfer of EO knowledge and EO tools to all the countries in the RoI is the cornerstone of this project. This transfer of knowledge should happen across all levels of industry and education. Therefore, a step to maximize the impact of the project is to ensure that state-of-the-art knowledge transfer becomes an integral part of the universities curricula. It is thus important to maximize the number of students, enrolled into university courses related to this project, who are informed regarding the project's actions. This can be achieved both on a temporary basis, as well as more profoundly and in a sustainable way.

In this line, a temporary course of action is to communicate to all partners employed in universities to mention the project and dedicate part of their lectures on the project's goals and achievements thus far. Furthermore, by directly informing their students of the online presence of GEO-CRADLE (i.e. the social media accounts and the webpage of the project), the number of social media users following the project could potentially be increased (see **Section 4.1.2**).

The more sustainable way is to ensure that the outputs of the project, as well as the tools, platforms, and data used become an integral part of the syllabus. For example, as part of Task 4.2 (Improved Food Security – Water Extremes Management), partners IBEC and TAU will generate a crash course into soil spectroscopy solely for the project partners. The material generated (which includes data, software code, presentations, and more) will be distributed to all partners. This can act as a basis for future lectures in universities in the RoI.

4.2 GEO-CRADLE actions, mechanisms and tools for engagement

In the following, the mechanisms and tools which can be applied to assist and enhance the engagement of users are listed.

The **Regional Data Hub** which stands at the epicentre of the project (Figure 23) will soon provide access to both region-related datasets, portals and services developed by a regional network of raw data providers, intermediate users/service providers, end-users from Industry, Academic and Public Sector from the Region of Interest, and, also, datasets and services directly fed from the GEOSS-portal. Moreover, being the centralised gateway for regional data providers to contribute easily and timely their products to GEOSS, the Regional Data Hub is designed to become the focal node in the region in the context of GEOSS and Copernicus implementation, contributing to the

further engagement among the relevant stakeholders of the complete EO ecosystem within the RoI.

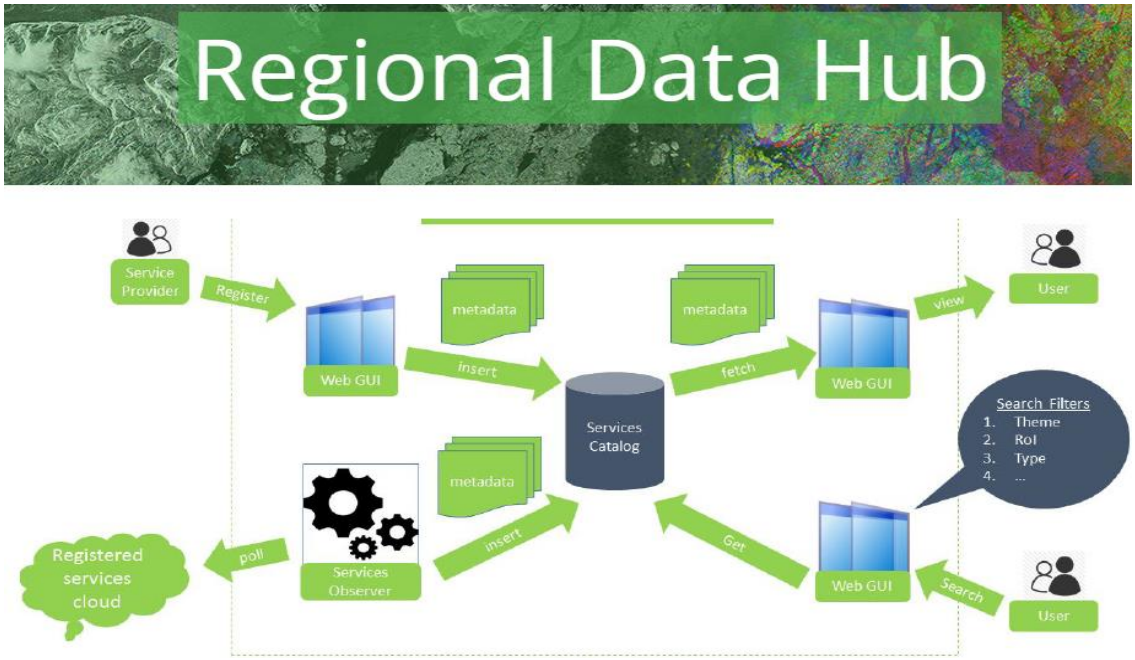

Figure 23: The various system components of the Regional Data Hub

The RDH will facilitate access to downloadable files of Space-borne data from real-time EO satellite mission acquisitions; data from airborne campaigns performed in the region; In-situ data; and Models such as Atmospheric and Climate.

Furthermore, a communication tool which has proven to be successful thus far, and should be employed in the future, is the use of **round table discussions** as side or major events during the project's workshops. The active and fruitful discussion stemming from these meetings ensures that the project partners attending the meetings can address any questions the regional stakeholders might have, and hence clarify all aspects of the project. It furthermore assists into ensuring that the sustainability of the project is achieved.

One more important action is to identify the points of contact which are responsible for the implementation of UN's SDGs in the countries within the RoI. Taking into account that the pilot activities undertaken in GEO-CRADLE address regional needs which are highly correlated to the SDGs, they will be interested into the project's actions, and how well they assist in meeting the SDGs.

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