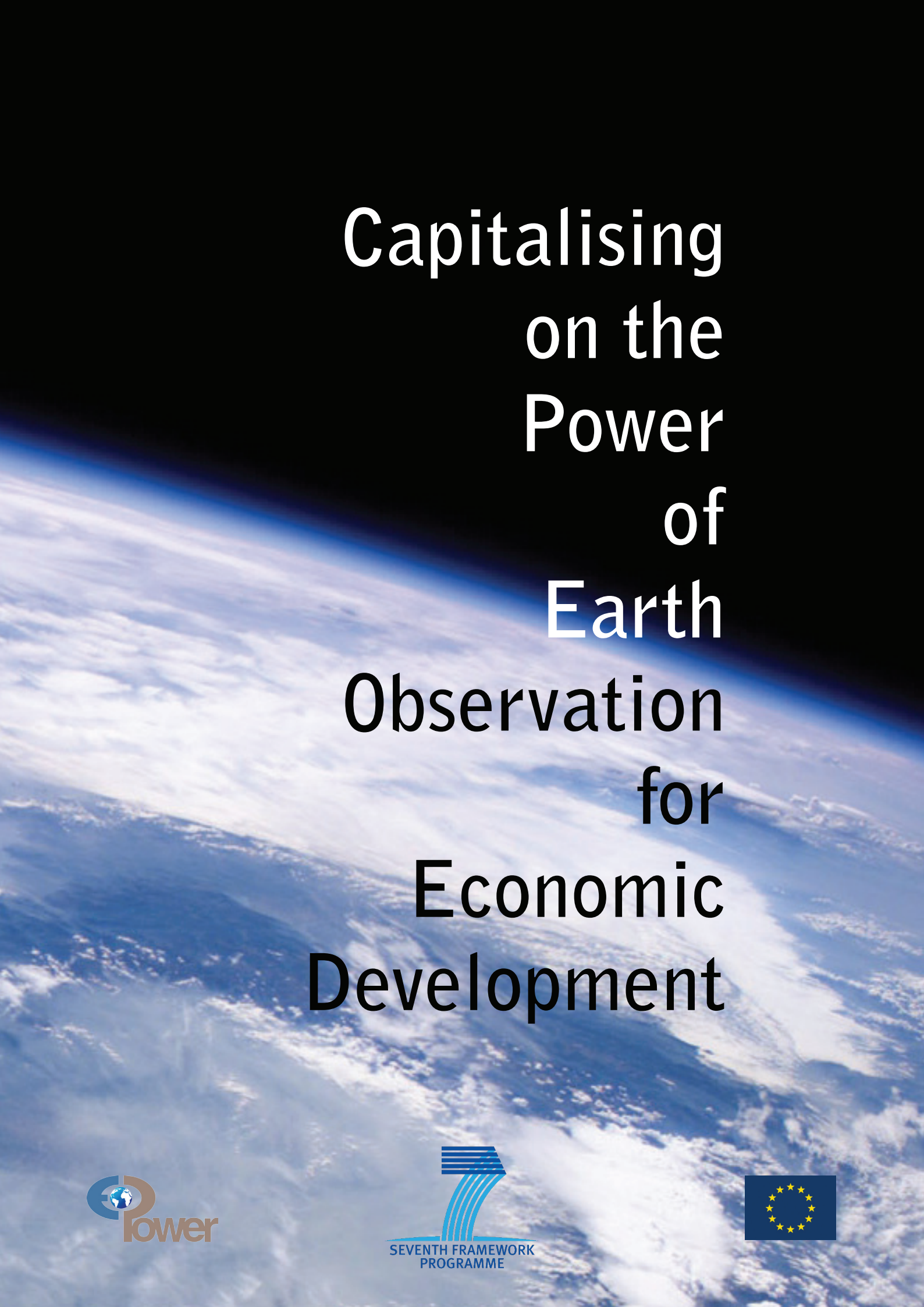
Capitalising on the Power of Earth Observation for Economic Development



SEVENTH FRAMEWORK PROGRAMME

EOPOWER
Capitalising on the Power of Earth Observation for Economic Development

August 2015

Lay out: MYRRH Design

The work leading to this report has received funding from the
European Union's Seventh Framework Programme (FP7/2007-2013)
under grant agreement n° FP7- 603500.

Table of contents

Summary

EOPOWER stands for "Earth Observation for economic emPOWERment". The main purpose of the project is to create conditions for sustainable economic development through the increased use of earth observation products and services for environmental applications. This purpose serves the higher goal of effective use of earth observation for decision making and management of economic and sustainable development processes. The marketing instruments applied to achieve this purpose are promotion, capacity building, and science valorisation.

As EOPOWER is about economic development, the focus of the project is on impact assessment of the project activities and on impact assessment of a selected number of earth observation solutions. A framework was developed specifically for this purpose. Although there are quite some marketing and strategy instruments that cover market and business development, it was felt that they are sound, but do not quite address the issue of technological innovation and introduction of new technology in the best possible way, in particular when this new technology is applied to solving environmental problems.

EOPOWER impact assessment framework

In the EOPOWER project case studies and activities were analysed that demonstrate the impact of earth observation applications and promotion of earth observation, using the EOPOWER impact assessment framework. The framework looks at a step-by-step analysis of where the EO application fits (or does not fit) in an conventional economic model, it applies a number of indicators to the application or activity (fit-for-purpose, comparative advantage, complexity to user / ease- of-use, elegance, cost-benefit, sustainability, resilience, reproduction capacity / flexibility, acceptance, level of knowledge transfer required, and ethics, transparency, public accountability, objectivity and impartiality), and looks at the general business environment. For promotion activities, it also takes into consideration a set of input indicators (promotion efforts) and output indicators (use of earth observation, resources mobilised for earth observation, level of raised awareness, participation in networks, media coverage, use of earth observation-related information, participation in capacity building activities and data use, sharing and submission in GEOSS).

The strategy lessons for successful promotion of earth observation are:

- Dissemination and capacity building increase exposure,
- Exposure creates opportunities,
- Opportunities need a tailor-made approach: building relationships.

The best instruments / lessons for successful dissemination and capacity building are:

- Dissemination and capacity building activities should be (also) directed at target groups outside the regular EO community,
- It is good practice to organise events with a part for decision-makers and a part for professional target groups,
- Webinars are very successful, especially when face-to-face meetings with the target group are difficult,
- Web portals (in the local language) are a must, success depends on active promotion,
- These web portals are preferably linked in a capacity building resources facilities network,
- Marketing toolkits and supporting materials facilitate easy access to information on EO and (business) environmental factors to decision makers, policy makers, professionals, local communities and students,
- Tried and tested courses on earth observation applications and GEO/GEOSS are very useful, either delivered face-to-face or online.

▶ Summary

Examples of created opportunities are:
- Additional (co-)funding of capacity building,
- New forms of cooperation,
- (Financial) support for testing and implementation of EO applications,
- Multiplier effect through increased activity of newly created committed communities,
- Increased involvement in the GEO process, including accession of new members.

The success of a tailor-made approach and building of relationships is demonstrated by:
- Provision of support specifically targeted at the end-user, such as processing of images and flexible capacity building adapted to end-user needs,
- Specific efforts to remove bottlenecks in developing countries, notably Africa, in the areas of web infrastructure and access to, and availability of, data,
- Success stories, where the link with decision-making has been made explicit, with special emphasis on the following: operational and fit-for-purpose aspects, reduction of the complexity of use (by simplifying user operations and/or technology transfer), increase of resilience (by always having a plan B available) and demonstrating reproduction capacity (scalability) of applications.

1. The EOPOWER impact assessment framework

As EOPOWER is about economic development, the focus of the project period is on impact assessment of the project activities and on impact assessment of a selected number of earth observation solutions. A framework was developed specifically for this purpose. Although there are quite some marketing and strategy instruments that cover market and business development, it was felt that they are sound, but do not quite address the issue of technological innovation and introduction of new technology in the best possible way, in particular when this new technology is applied to solving environmental problems. The developed framework aims at closing this gap, with a special emphasis on earth observation. The methodology is shortly described below.

The benefits of earth observation applications need to be placed in a framework that not only accounts for economic aspects, but also for benefits that are currently not captured in economic calculations, such as those relating to sustainable management of natural resources and climate change (see figure 1).

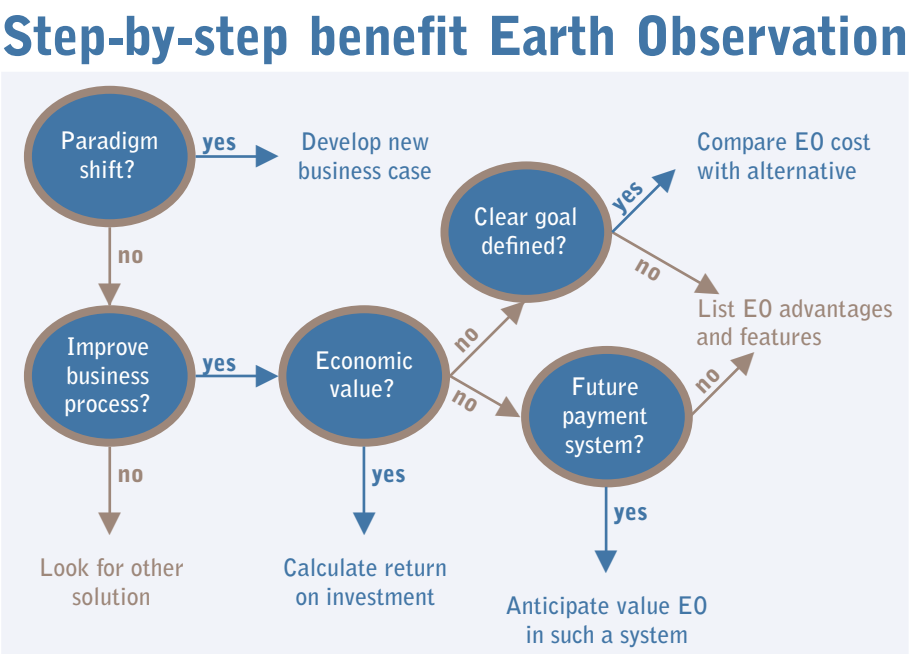


Figure 1 Framework for a step-by-step analysis of the benefits of earth observation (source: GEONetCab, 2013)

To better relate to customer value propositions, the following questions are asked:

- Does the new application cause a paradigm shift?
- Is the current business or organisation process improved?
- Does the application provide economic value that can be quantified?
- Is a clear measurable goal defined to which the earth observation application contributes?
- Is a future payment scheme or other economic mechanism foreseen in which the EO application fits?

If earth observation provides added value, the answers to the questions yield a set of comparative advantages that is attuned to the state-of-the-art of the problem to be tackled and to the way the client perceives this problem.

In addition to stressing technical features of the proposed earth observation solutions, a number of indicators are used to identify weaknesses and to achieve a better focus of promotion activities. The indicators describe the following characteristics: fit-for-purpose, comparative advantage, complexity to user / ease-of-use, elegance, cost-benefit, sustainability, resilience, reproduction capacity / flexibility, acceptance, level of knowledge transfer required, and ethics, transparency, public accountability, objectivity and impartiality. Where possible, a quantitative analysis is carried out, accompanied by a qualitative assessment for all indicators (see table on next page).

▶ 1. The EOPOWER impact assessment framework

no.	indicator	quantitative assessment	qualitative assessment on a scale of 1 (=poor) to 5 (=excellent)
1	fit-for-purpose	not applicable	based on description of what the EO application actually does
2	comparative advantage	calculation of degree in which the EO application is better than alternatives	based on listing of comparative advantages
3	complexity (to user) / ease of use	not applicable	based on user testimonials and user surveys
4	elegance	none, or it should be the size of the user community	based on user testimonials and user surveys
5	cost-benefit	cost-benefit calculation	based on quantitative assessment
6	sustainability	not applicable	based on sensitivity analysis of the EO application
7	resilience	cost-benefit calculation of plan B	based on risk analysis of the EO application
8	reproduction capacity / flexibility	calculation of reproduction costs for application in other regions or situations; measurement of spreading of actual use	based on quantitative assessment and description of the EO application
9	acceptance	none, or survey results about acceptance; after introduction of the solution: number of clients and/or users	based on user testimonials and user surveys
10	level of knowledge transfer required	cost and time required to get the users at the desired knowledge and skill level	based on knowledge transfer plans and evaluation of training activities
11	ethics, transparency, public accountability, objectivity and impartiality	not applicable	based on user testimonials and user surveys

Table 1 Impact assessment indicators

A rating of the business environment is also needed. This is done by assessing the following aspects:

- Willingness to pay (by clients),
- Embedding (in organisational processes),
- Openness (transparency and ease of doing business, access to markets),
- Institutions (is the institutional environment conducive to doing business, acceptance of new solutions).

Apart from general marketing considerations that deal with customer value propositions, buyer behaviour and motivation and crossing the technology chasm, a number of elements is particularly interesting to

▶ 1. The EOPOWER impact assessment framework

geospatial solutions, such as openness and free availability of geospatial data, accompanying regulatory and legislative frameworks and the inclusion of systems of environmental accounting and payment for ecosystem services.

For promotion, networking and dissemination, the activity level with respect to success stories, marketing toolkits, pilot projects, resource facilities, dissemination efforts and organisation/attendance of promotion events is measured as input indicators. The following output indicators are applied: use of earth observation, resources mobilised for earth observation, level of raised awareness, participation in networks, media coverage, use of earth observation-related information, participation in capacity building activities and data use, sharing and submission in GEOSS.

To assess the impact of the promotion, networking and dissemination activities for earth observation a reflexive approach is adopted, where the assessment for earth observation applications is repeated, but now at the meta-level for promotion. This means that the same indicators are used, but with a focus on promotion, networking and dissemination. The final result is then a total impact assessment package that provides a good indication and description of (potential) impact of earth observation applications and dissemination, networking and promotion activities and a good insight in the critical missing elements or shortcomings that merit particular attention to improve performance.

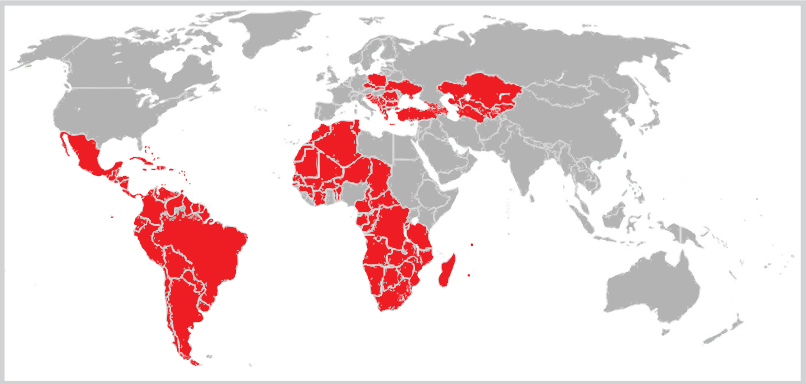


Figure 2 Regions of the EOPOWER project

This methodology was applied in the different regions of the project on the following subjects:

- Southern Africa: increased use of EO data with emphasis on the use of SPOT (and other) satellite imagery,
- French-speaking Africa: regional conferences for the promotion of the use of EO,
- Czech Republic and Slovakia: use of EO technologies in national parks,
- Poland and Ukraine: promotion, networking and dissemination activities for EO,
- Turkey and Turkish-speaking countries: promotion of the use of RASAT satellite images and the use of the GEZGIN Geoportal,
- Balkan region: support to flood and land management in Serbia and Caravan events (workshops to raise awareness on GEO, GEOSS and EO and address questions of interest for the future of EO) held in the Balkan region,
- Black Sea region: "Bringing GEOSS Services into Practice" workshop and EO promotion activities and their impact in Armenia,
- Latin America and the Caribbean: networking and capacity building in disaster reduction,
- International organisations: EO for water resources management, related to the Water Partnership Programme of the World Bank.

2. Towards empowerment and economic development

Dissemination and capacity building increase exposure

That dissemination activities should be directed more broadly at target groups outside the (traditional) EO community was an important lesson of the GEONetCab project. The EOPOWER project also continued with the organisation of so-called "combined events": with a part for both decision-makers and professionals, preferably starting with a general part focused on decision-making, then followed by a more technical workshop or course for professionals that takes some more time. This approach was adopted by most project participants. In Poland webinars were used to circumvent the communication problems that were a result of the crisis in Ukraine. This proved to be a very effective approach.

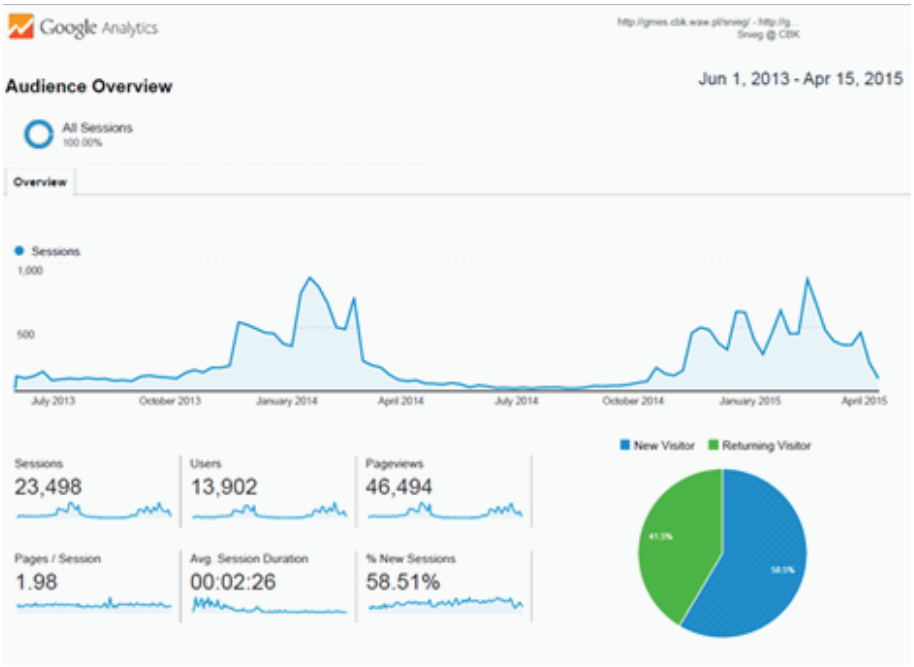


Figure 3 Statistics for the snow-cover portal (Poland)

Web portals are also a popular and effective instrument for dissemination.

The snow cover portal in Poland draws quite a number of visitors during the winter months (see figure 3).

Related to this portal CBK WAW established an EOPOWER web portal. The number of visits to the website is correlated with events that are organised, underpinning the importance of continuous dissemination.

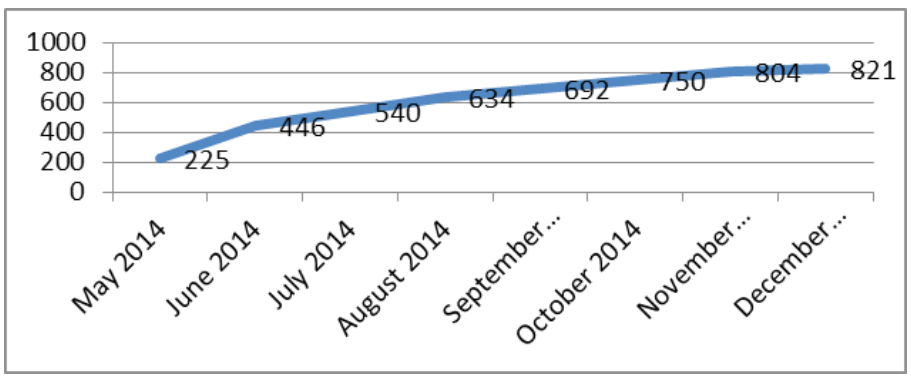


Figure 4 Cumulative number of downloads of the workshop material of the course "Bringing GEOSS services into practice" in function of time (March 2014 to December 2014) from the open archive of Geneva University.

Promotion of GEO and GEOSS was also done successfully through the course "Bringing GEOSS services into practice" (figure 4), developed by UNIGE and others in the enviroGRIDS project.
As a consequence of this course communities were created that contribute actively to the work of GEO. Another good example is the series of Caravan workshops, coordinated by AUTH.

▶ 2. Towards empowerment and economic development

In the Balkan region events contributed to show the comparative advantages of EO, the reliability of the application to increase acceptance and resulted in awareness raising, partnering and networking. Similarly in the Czech Republic and Slovakia impact was achieved by showing data availability and comparative advantages to potential users. The accompanying networking activities and institutional support were very important for the success of the training courses. The Czech Republic (with support from ESA) and South Africa (outreach programme to schools), and also others, such as Poland, focused on young target groups: training at all school levels and universities. An important lesson is that to reach the pupils you have to go through the trainers. In Latin America and the Caribbean INAOE/CRETEALC created a network of supporting institutions, with a focus on disaster management. Receiving and processing feedback when doing this is important as TUBITAK also learned, while managing the GEZGIN portal on images of Turkish satellites, such as RASAT (see figure 5). TUBITAK also provides training on how to use the portal and the images, as do other project partners, such as SANSA for the SPOT multi-user licence. TUBITAK plans to extend the use to the Black Sea region and has already built a close relationship with Azerbaijan.

Figure 5 GEZGIN geoportal opening meeting and mass media event (19 August 2014)

Similar successful experiences with web portals were obtained in the Czech Republic, the Balkan Region (where the Permanent Networking Facility is very successful) and French-speaking Africa. One of the project results was the establishment of the GEO resource facility for capacity building, GEOCAB, that was developed by IRD as a node in the network of resource facilities for capacity building (see chapter 3 on capacity building).

▶ 2. Towards empowerment and economic development

Facilitating access to information remains very important. Decision makers, policy makers, professionals, local communities and students should have easy access to information on earth observation applications and on the general (business) environment. The marketing toolkits and reference lists that were developed and updated by HCP for this purpose where downloaded about 20,000 times, of which more than 18,000 from the PNF. ITC developed a number of short, online courses for professionals on earth observation topics that cover all GEO societal benefit areas.

Exposure creates opportunities

The exposure that resulted from dissemination activities and capacity building, funded by the EOPOWER project, created opportunities: for (co-)funding of new activities (as CRASTE-LF did for French-speaking Africa with ISESCO), and for new types of cooperation (as CUNI did in the Czech Republic with the Copernicus secretariat and CRECTEALC in Latin America and the Caribbean with UN-SPIDER, SWF, and others). In several parts of the Balkan region, support was received from regional governments. The approach has convinced people of the usefulness of earth observation and opened a dialogue between stakeholders. As stated above, the creation of committed communities that already took part in various projects or activities, provided a big boost to further promotion of earth observation. Although not entirely attributable to project efforts, EOPOWER definitely contributed to the accession of Armenia, Georgia and Poland to GEO.

Opportunities need a tailor-made approach: building relationships

The focus should always be on the end-user and maintaining a dialogue with the target group at the appropriate level is important. CRASTE-LF therefore made a distinction in French-speaking Africa between different regional zones and target groups, depending on how advanced they were in the uptake of earth observation. Remaining in Africa and looking at the "business environment": no or slow internet access in Africa is a bottleneck for the uptake of earth observation (as was experienced in the project for the French-speaking Africa region and SADC-region). Until this is resolved, alternative solutions have to be provided, such as delivering data through GEONETCast, which was actively promoted by the project. Whatever the means, access to data remains important: the project (notably UNIGE) worked on promotion and further development of the AfroMaison Africa broker (www.afromaison.net) to improve data accessibility. The broker will also play a role in the AfriGEOSS initiative.

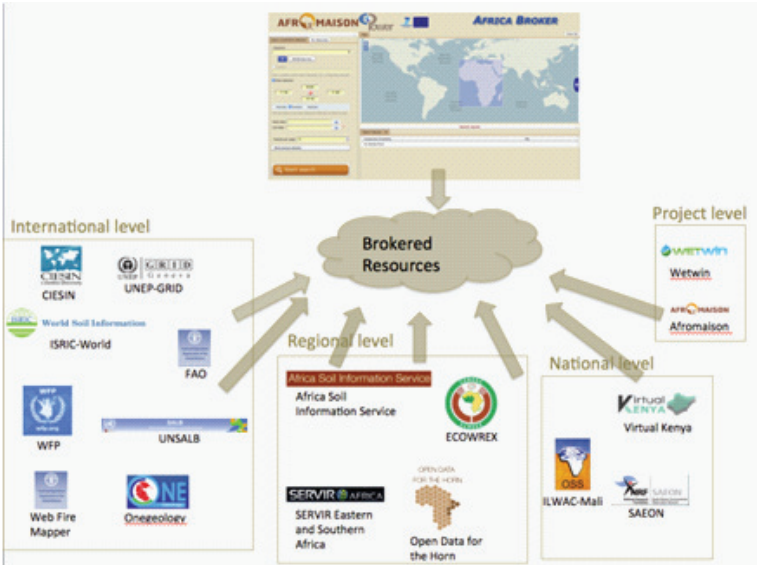


Figure 6 Brokered resources in the Africa broker

In Turkey an important lesson learned was to provide (different types of) processing of images for different target groups: scientists may prefer raw images, but, for example, disaster agencies want (processed)

▶ 2. Towards empowerment and economic development

"before" and "after" images. By doing this, the number of users and types of applications can be increased, while continuously receiving and processing feedback. In the Balkan region UNS, UNIST and AUTH obtained success by looking for promising applications, such as flood management, hydrology mapping and wetland management (in combination with agriculture). The relevance to decision-making depends on the proposed solution, it is very important to take the "complexity-to-the-user" aspect seriously.
SANSA was actively engaged in promoting the multi-user SPOT-licence: it provided workshops on specific topics and processing of images for different target groups (just as in Turkey). The impact has been very positive in South Africa, with 87% of customers using the data and over 90% of this group satisfied about the data (rated 8 out of 10). A positive side-effect is that data sharing is taking place.

Figure 7 Waterlogging near the lock Botoš (Vojvodina, Serbia)

More often than not, contact with end-user target groups result in a powerful feedback message to the remote sensing community (scientists, administrators, private sector). Take the case of the World Bank Water Partnership Programme. The WPP became convinced of the potential of earth observation for water resources management and an extensive analysis of the feasibility of EO for WB operations was carried out. During the process it became evident that a very clear message back to remote sensing community is that relevance to decision-making should be made more evident (compare experiences in the Balkan region mentioned above). The remote sensing community should more clearly demonstrate that the applications are operational and fit-for-purpose, reduce the complexity of use (by simplifying user operations and/or technology transfer), increase resilience (by always having a plan B available) and ensure reproduction capacity (scalability) of applications.

The tailor-made aspect and building of relationships are also important for contributions to GEO. Pilots implemented during the EOPOWER project, guided by CNR-IIA, as follow-up from the EGIDA project, showed that some institutional players are prepared to contribute datasets to GEOSS, but for others (for example National Parks in the Czech Republic) it is simply too far removed from their mandate and/or they do not have the required time or capacity. An intermediary should then fulfil this role, such as CUNI or the Copernicus secretariat.

3. Capacity building

Learning and knowledge management are very important elements in the promotion of the use of new technologies, such as earth observation. In fact, marketing of earth observation can be defined as promotion and capacity building. As complement to GEOSS, which contains "hard" datasets on earth observation, the EOPOWER project therefore had the aim to establish a one-stop shop with references to capacity building resources and material, building on previous efforts in the GEONetCab project. In the GEO Plenary of November 2014 this system, called GEOCAB, was officially adopted and is accessible through the GEO website and directly: www.geocab.org.

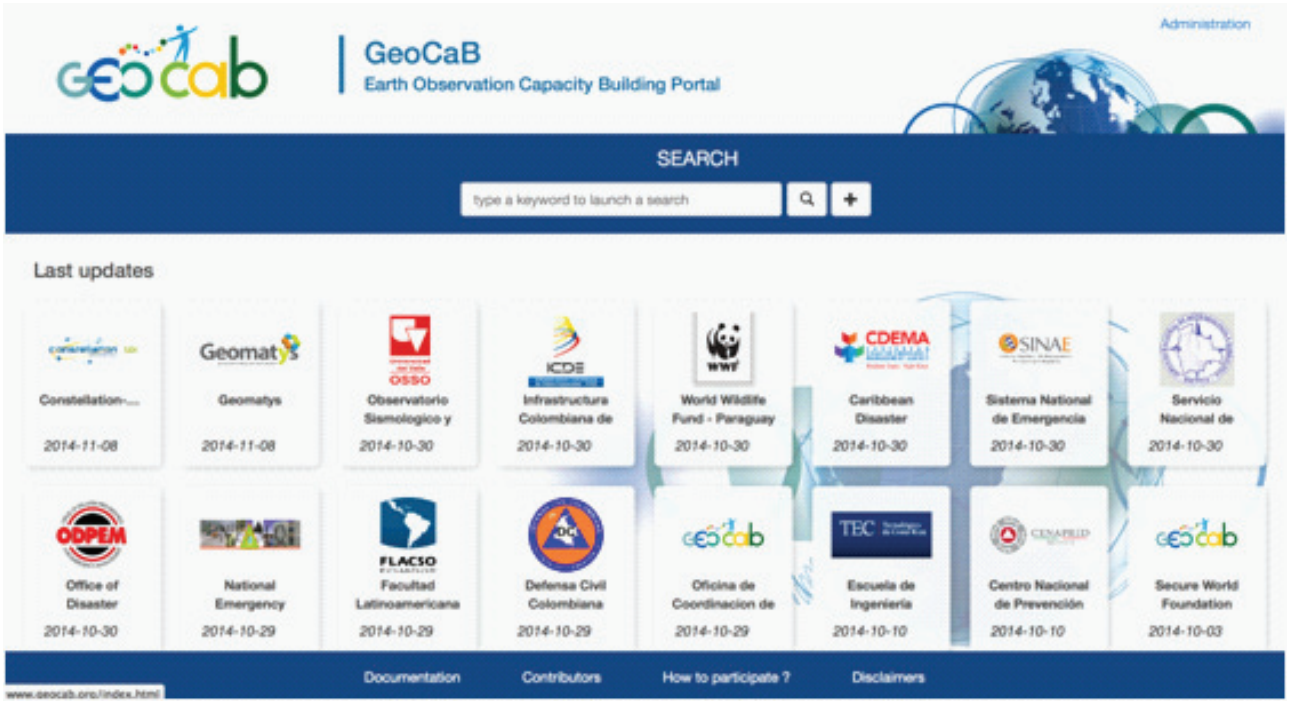


Figure 8 GEOCAB home page

The portal contains currently more than 1,000 references; a group consisting of virtually all the project partners and the GEO Secretariat, with support from CEOS, has committed itself to expand and maintain the portal after the end of the project. In addition to GEOCAB, a number of regional web resource facilities were established, expanded and/or improved. Considerable effort went into achieving compatibility between the regional websites and GEOCAB, for which a broker was designed, similar to the brokering approach used for GEOSS. Regional resource facilities are especially important, because they can address local issues more effectively than a central facility and they can reach the target group in the local language. Important course and information material on EO, until now only available in English, was therefore translated in an array of languages.

To enlarge the target group of potential EO users, capacity building material was developed in the form of 3-day courses for professionals. In this way the knowledge, skills and competences can be upgraded and/or expanded of groups that were not familiar with EO before. Each societal benefit area of GEO (except health and energy) is covered with a specific topic: climate/weather, biodiversity, biomass and carbon mapping, flooding, landslides and crop monitoring. The courses are interactive and contain theory,

▶ 3. Capacity building

exercises, videos and a quiz. A building block of 3-days corresponds to 1 European credit (part of the European Credit Transfer and Accumulation System (ECTS)).

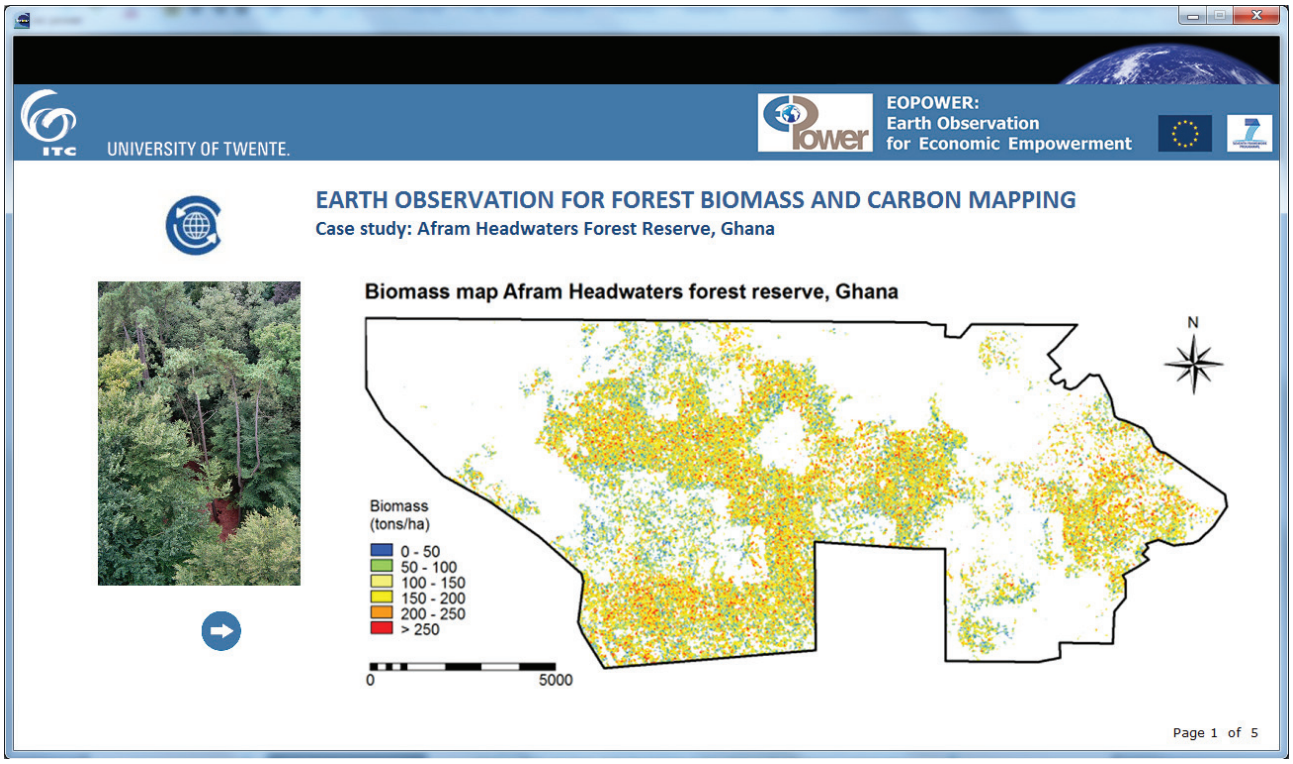


Figure 9 Example of the front page of the course on earth observation for forest biomass and carbon mapping

The course "Bringing GEOSS services into practice" was updated and upgraded by UNIGE. In cooperation with local partners courses were given in workshop form in the wider Balkan area, the Mediterranean region, Africa and the Caucasus region, in English and in French (see also chapter 2). The course material is now translated into 8 languages: English, French, Arabic, Russian, Spanish, Serbian, Croatian and Czech.

4. Promotion

Within the EOPOWER project regions, each partner has its own strategy, approach and focus for the promotion of EO, connected together by the general EOPOWER promotion materials and formats. All regional partners made use of websites and associated resource facilities that provide data and services and built and maintain databases of local stakeholders. Most partners also compiled success stories.

In Southern Africa the focus of dissemination activities was mainly on water, agriculture, environment and human settlement. The activities were directed at different target groups, ranging from school level (including Fundisa disk delivery) to scientists. Local nodes were identified to strengthen local presence throughout the region. The World Space Week, ESA-TIGER training-of–trainers project and AARSE conference provided special occasions to emphasise capacity building and promote EO. The SPOT multi-licence for government agencies provides a good umbrella for promotion and capacity building in the public sector.

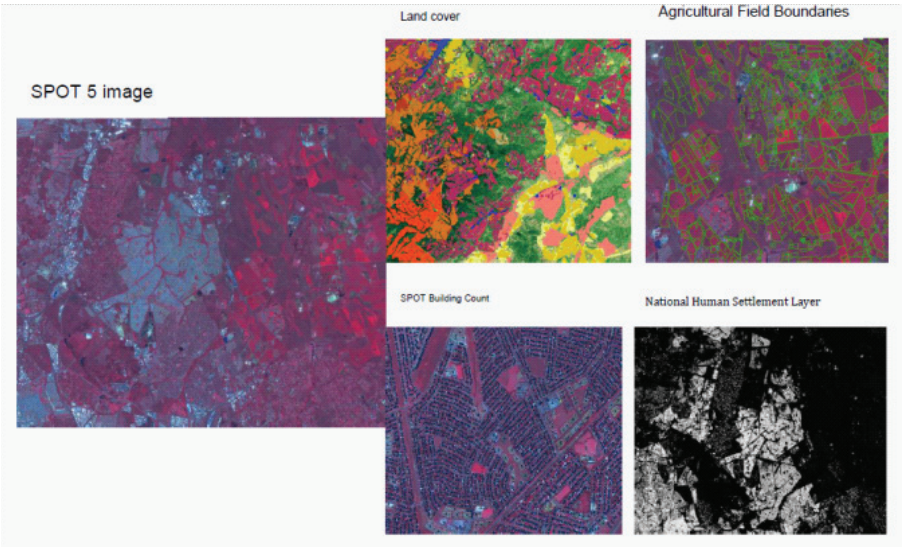


Figure 10 Example of national value added products derived from SPOT 5


Fraternité Matin Jeudi 6 mars 2014 Société 13

Développement durable

L'observation de la terre au coeur du processus

L'information spatiale affecte 60 à 80% des décisions.

AVIS D'APPEL D'OFFRES (AAO)

Projet d'accélération et intégration de PEC globale des PVVIH dans les régions du Centre, du Nord et du Nord Est de la Côte d'Ivoire

AAO N° 5: 004/2014/ NAI-BOUAKE : Portant sur la recherche de fournisseurs

Figure 11 Press coverage in Ivory Coast of EOPOWER event

In French-speaking Africa a wide array of dissemination activities was organised, such as workshops and conferences in Cameroon, Ivory Coast, Benin, Tunisia and Morocco, with participants from many countries.

The subjects were related to water, agriculture, (space) weather and climate change. For the latter a network of African scientists (RAOCC) was created and expanded.

A website hosts two portals for water management data and information in Morocco and Ivory Coast.

▶ 4. Promotion

In the Czech Republic and Slovakia cooperation continued with national parks on environmental management. The Czech experience was leveraged to Slovakia, with the help of strategic partners in both countries. Dissemination activities also focused on educational projects at school and university level. An atlas with local success stories was produced.

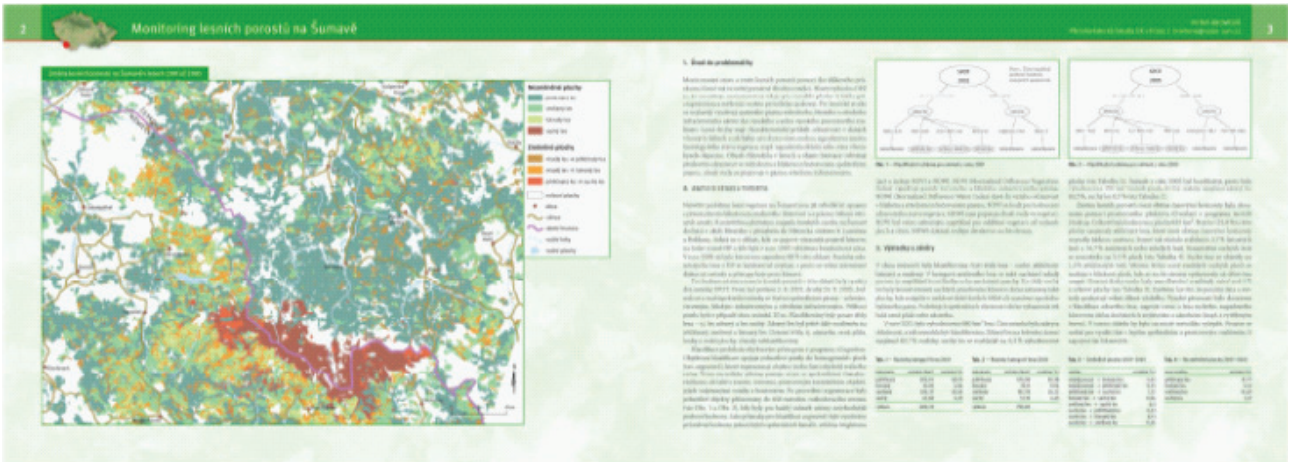


Figure 12 Page from the atlas showing forest monitoring using remote sensing in Sumava park

In Poland and Ukraine also special activities were organised for teachers, students, youths and parents. Other target groups of the dissemination activities were professionals, policy makers, public administrators and SMEs. The website provides the backbone for interaction with these target groups. Special effort went into strengthening ties with the (potential) EO community in Ukraine, which was difficult because of the political situation. The organisation of webinars proved to be the solution to interact and transfer knowledge. In addition, actions have been taken to lobby for Poland's membership of GEO (resulting in accession).

Figure 13 Representatives of Polish and Ukraine scientific and educational institutions and NGO's meet atCBK WAW

Turkey and the Turkish-speaking countries provide another example of a strong web-based presence, where the distribution of RASAT satellite images and the presence of the GEZGIN Geoportal is used to strengthen dissemination and receive feedback from users. In South-Eastern Anatolia a pilot is supported on (sustainable) agriculture and cooperation with various government agencies was intensified, particularly in the area of disaster and emergency management. Several activities were organised in the framework of Asia – Pacific cooperation. For networking in the region use was made of the existing contacts of the previous SEOCA project. Special attention was given to Azerbaijan, in the form of cooperation visits and training. A lobby

▶ 4. Promotion

was started for GEO-membership of Azerbaijan, possibly followed by accession of other countries of the region.

Figure 14 Training in EO satellites and data of Azercosmos staff

In the Balkan region four Caravan workshops were organised: one in Novi Sad on the future of EO in the Balkan region, one in Thessaloniki on marketing and use of the resource facility (in combination with the GEOBIA conference), one in Kosovo for the promotion of EO and one in Serbia to connect scientists and SMEs on the state-of-the-art of EO. Output was also published in the South-Eastern European Journal of Earth Observation and Geomatics. Apart from the focus on general technological advancement, agriculture and flooding (waterlogging) received special attention. A Balkan Liaison Office was established. The Permanent Networking Facility that was set up in the earlier BalkanGEONET project and enhanced during the EOPOWER project is so successful, that it now also hosts data and services for EO users in Africa, in the framework of the AfriGEOSS initiative.

Figure 15 Television interview at the first Caravan workshop

Similar to South Africa and Turkey, a technical web-based platform for water, soil and environmental

▶ 4. Promotion

modelling was one of the backbones for dissemination in the Black Sea region. The work builds on the results of the former enviroGRIDS project and is supported by technical workshops (http://eopower.grid.unep.ch:8080/dataextractor/examples/swatappli.html). Another dissemination instrument is the course "Bringing GEOSS services into practice", which was given quite a number of times, both inside and outside the region. The lobby for GEO-membership of Armenia and Georgia was strongly supported and resulted in accession to GEO for both countries.

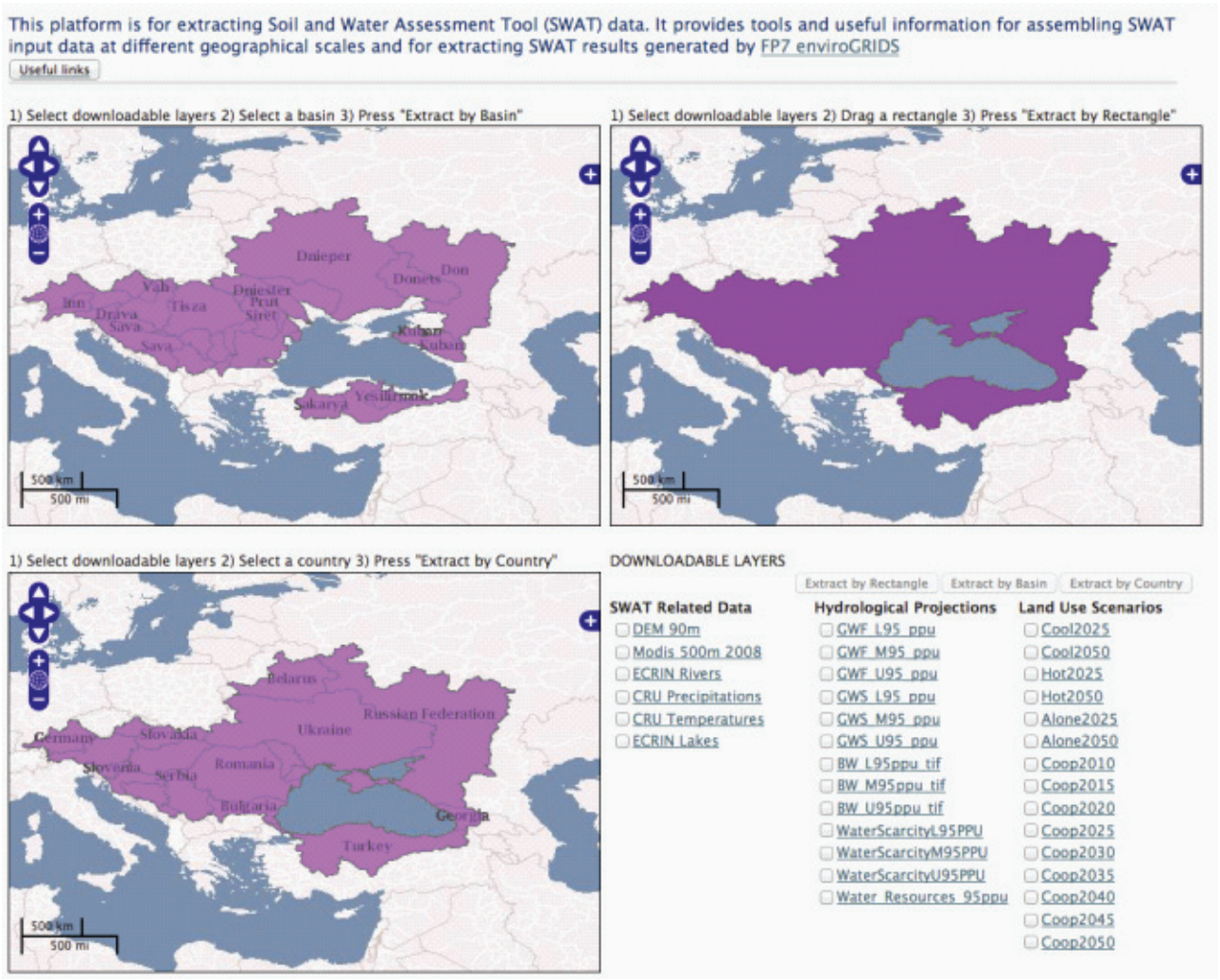


Figure 16 Web-based GUI of the common EOPOWER-IASON platform for the Black Sea region

In Latin America and the Caribbean the focus of dissemination activities is exclusively on disaster reduction. In total 16 events were organised (one in El Salvador, one in Costa Rica and the rest in Mexico) with the aim to involve all stakeholders in disaster management. To optimise results, this was done in cooperation with a strong field of international partners, such as the GEO Secretariat, UN-SPIDER, SWF, CEOS and MCTP. Three workshops deserve special mention: participants from twelve countries received training on the use of open-source software for disaster reduction and flood modelling. A working group is established

▶ 4. Promotion

by focal points that were identified earlier. The self-motivation of the working group is the wish to build further capacity in EO applications to reduce flood and drought disasters and to strengthen operational use of EO in their day-to-day work. At present, the working group has representatives from twelve user institutions in Brazil, Colombia, Cuba, Ecuador, Guatemala, Honduras, Mexico and Venezuela including two space agencies of the region and three international organisations, including INAOE/CRECTEALC.

Figure 17 Participants in the workshop on the use of open-source software and satellite data in the prevention of, and response to, disasters in Mesoamerica in Puebla, Mexico

The project also gave special attention to the promotion of the use of earth observation in international organisations, such as UN-SPIDER, EuropeAid, the World Bank, ICPDR, BSCPS and UNEP.

All these activities contributed to achieving the goals of several tasks in the GEO 2012 – 2015 Work Plan, notably task ID-05-C1 "Resource mobilisation for capacity building", ID-02 "Capacity building" and ID-04 "User engagement".

5. The innovation chain

The EGIDA methodology is a general methodological approach for implementing a (re-) engineering process of the S&T national infrastructures and systems, which can be adopted by national/regional S&T communities, for a sustainable contribution to the GEOSS and relevant European initiatives based on a system of systems (SoS) approach, through the mobilisation of resources made available from the participation in national, European and international initiatives and projects. In the EOPOWER project the methodology was tested in the following pilot projects to see how it can be improved:

- EO for sustainable management of nature protected areas (Czech Republic and Slovakia),
- Environmental SDI in Armenia,
- River banks of the Bouregreg dam (Morocco),
- Advanced level webinars in the EO field (Poland and Ukraine).

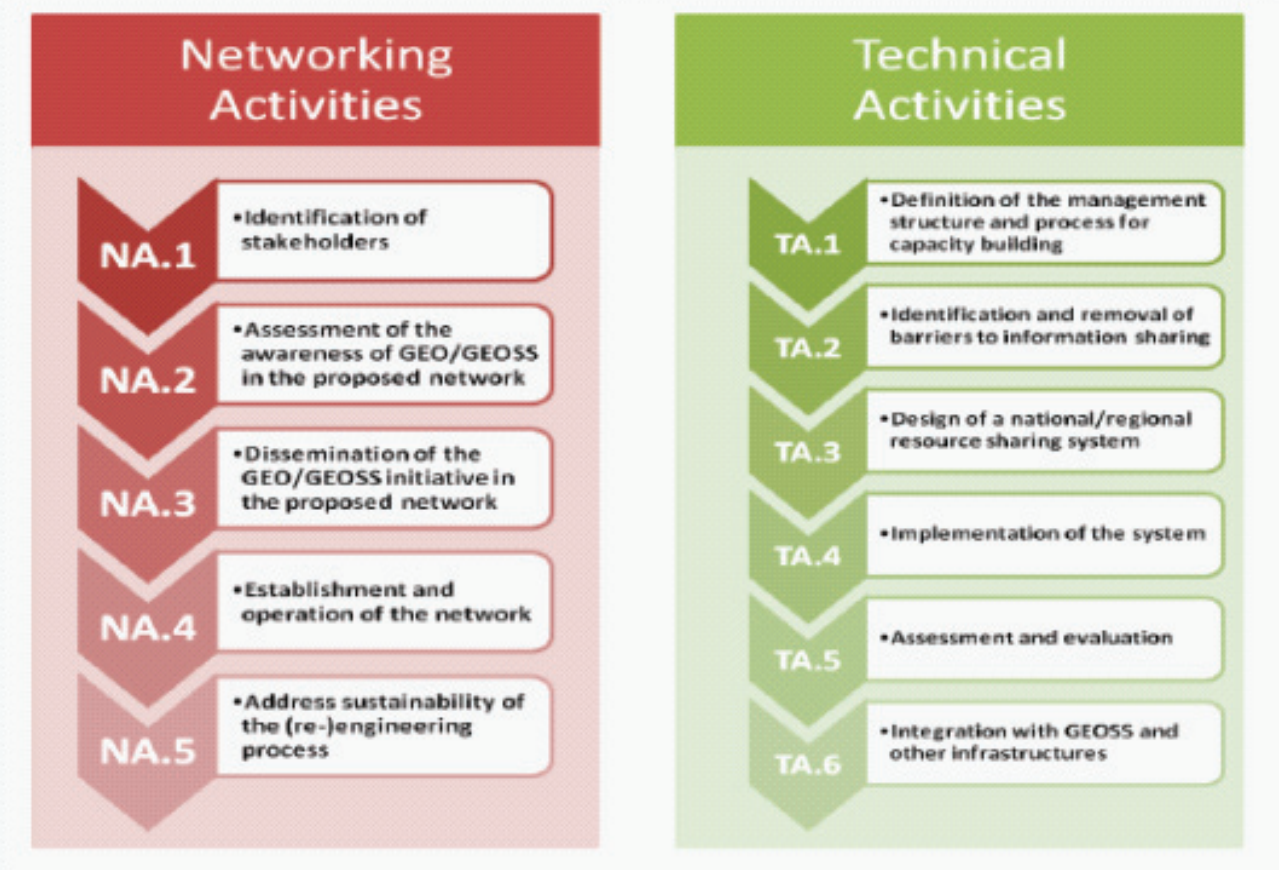


Figure 18 Framework of the EGIDA methodology

Based on the outcome of the pilots, a number of issues were identified that are used to improve the EGIDA methodology. The issues to be dealt with concern the use of questionnaires, social media and stakeholder databases for networking, and suggestions for processing user feedback, guidelines and communication for technical activities. To improve the technical activities further, in a joint effort of the EOPOWER and IASON projects, the EOPOWER framework for impact assessment (highlighted in chapter 1) was integrated with the EGIDA Methodology to cover assessment of business potential and contribution to GEOSS for the whole innovation chain.

List of acronyms

AARSE	African Association of Remote Sensing of the Environment
BalkanGEONET	Balkan GEO Network
BLO	Balkan Liaison Office
BSCPS	Black Sea Commission Permanent Secretariat
C	Component
CEOS	Committee on Earth Observation Satellites
EC	European Commission
ECTS	European Credit Transfer and Accumulation System
EGIDA	Coordinating Earth and Environmental Cross-Disciplinary Projects to promote GEOSS
enviroGRIDS	Building Capacity for a Black Sea Catchment Observation and Assessment System supporting Sustainable Development
EO	Earth Observation
EOPOWER	Earth Observation for Economic Empowerment
ESA	European Space Agency
EU	European Union
Eurisy	Organization for acting collectively to bridge space and society
FP7	Seventh Framework Programme
GEO	Group on Earth Observations
GEOBIA	Geographic Object-Based Image Analysis
GEOCAB	GEO Resource Facility for Capacity Building
GEONetCab	GEO Network for Capacity Building
GEONETCast	Global Network of Satellite Based Data Dissemination Systems
GEOSS	Global Earth Observations System of Systems
GIS	Geographic Information System
GUI	Graphical User Interface
IASON	Fostering Sustainability and Uptake of Research Results through Networking Activities in Black Sea & Mediterranean Areas
ICPDR	International Commission for Protection of the Danube River
ID	Institutions and Development
ISESCO	Islamic Educational, Scientific and Cultural Organization
MCTP	Mesoamerican Centre for Theoretical Physics
NGO	Non-Governmental Organisation
PNF	Permanent Networking Facility
RAOCC	Regional Centres African Network on Earth Observation and Climate Change
S&T	Science and Technology
SDI	Spatial Data Infrastructure
SEOCA	GEO Capacity Building Initiative in Central Asia
SME	Small and Medium Enterprise
SoS	System of Systems
SPOT	Satellite for Observation of the Earth
SWF	Secure World Foundation
TIGER	Technology Informatics Guiding Education Reform
UN-SPIDER	United Nations Platform for Space-Based Information for Disaster Management and Emergency Response
UNEP	United Nations Environment Programme
WB	World Bank
WPP	Water Partnership Programme

List of project partners

AUTH	Aristotle University of Thessaloniki (Greece)
CBK-WAW	Space Research Centre – Polish Academy of Sciences
CNR-IIA	Institute of Atmospheric Pollution Research – National Research Council (Italy)
CRASTE-LF	African Regional Centre for Space Science and Technology in the French Language
CRECTEALC	Regional Centre for Space Science and Technology Education in Latin America and the Caribbean, Campus Mexico (in association with INAOE)
CUNI	Charles University (Czech Republic)
ESPACE-DEV	Space for Development (France)
HCP	HCP international (the Netherlands)
INAOE	National Institute of Astrophysics, Optics and Electronics (Mexico)
IRD	Research Institute for Development (France), as part of ESPACE-DEV
ITC	Faculty of Geo-Information Science and Earth Observation, University of Twente (the Netherlands)
SANSA	South Africa National Space Agency
TUBITAK	Space Technologies Research Institute (Turkey)
UNIGE	University of Geneva (Switzerland) – project coordinator
UNIST	University of Split (Croatia)
UNS	University of Novi Sad (Serbia)

All EOPOWER documents and publications with detailed information on activities and results can be found on the project website.

www.eopower.eu