

ANNEX

**WORK PROGRAMME 2012**

*European Earth monitoring programme (GMES)  
and its initial operations (2011 – 2013)*

*(European Commission C(2011)8027 of 11 November 2011)*

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# GMES REGULATION – DRAFT WORK PROGRAMME 2012

## 1. INTRODUCTION

This document constitutes the annual work programme adopted by the European Commission in accordance with the article 15 of the Regulation on the European Earth monitoring programme (GMES) and its initial operations (2011 – 2013)<sup>1</sup> (referred to hereafter as the "GMES Regulation").

GMES initial operations are a transition from the GMES build up phase, which was financed mainly through FP 7 funds and contributions from ESA Member States, to the full exploitation of GMES. During this transition phase, the development of GMES-dedicated satellites (the Sentinels) continues, while many of the pre-operational services projects will continue to be financed with research funds. EUR 107 million will be made available under the GMES Regulation.

According to the principles of sound financial management, activities financed through the GMES Regulation and activities financed through FP7 will be clearly defined and separated, and be eligible in accordance to the specific rules of the two instruments. At the same time, the Commission will work towards full coherence, synergies and complementarity of actions funded by the two programmes.

Crucial to the success of the GMES service component is the compliance with the requirements of the INSPIRE directive<sup>2</sup>, related Implementing Rules and associated technical guidelines. All foreseen GMES activities shall therefore ensure compliance with, and actively contribute to the development of, the relevant INSPIRE Implementing Rules and associated technical guidelines.

The budget for 2012 relating to the GMES Regulation amounts to EUR 39 millions under budget line 02 02 15 (European Earth observation programme GMES) and EUR 1 million under budget line 02 01 04 06 (European Earth observation programme (GMES) — Expenditure on administrative management).

## 2. STRUCTURE OF THE GMES REGULATION 2012 WORK PROGRAMME

Article 3 of the GMES Regulation defines the fields that may be covered by actions in the context of the GMES initial operations. With a view to the limited funding available in 2012 and in order to optimise the available resources (both from the GMES Regulation and from FP 7 Space), the Commission proposes to concentrate the work programme 2012 on the following fields:

- (1) The land monitoring (including global land monitoring) and emergency management themes of the service component of the GMES programme;
- (2) Take up of services by users;
- (3) The GMES space component;
- (4) Support for GMES policy measures set out by the Regulation.

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<sup>1</sup> OJ, L 276, 20.10.2010, p. 1.

<sup>2</sup> Directive 2007/2/EC - OJ L 108 of 25.4.2007, p. 1.

Activities (1), (3) and (4) ensure the continuity of the actions already launched in 2011, while the Global Land part under action (1) and (2) are new activities to start in 2012.

The work programme 2012 keeps the focus on the GMES emergency management service and land monitoring service which is also extended to the Global component. Following the start of the GMES initial operations in 2011, actions aiming to ensure the quality of those services in particular by valid space data through appropriate reference data and to support the take up of services by users are essential for accompanying the transition to operational services.

In 2012, support to the GMES space component is ensured via the EC delegation agreement to ESA in preparation of initial operations of Sentinel-1-2-3. In addition, measures aiming to support the operation of the User Forum, to prepare delegated acts on data policy and to prepare an interim programme evaluation (according to the Art. 14 of the GMES Regulation) are planned in 2012.

### 3. INDICATIVE BREAKDOWN OF 2012 BUDGET BY ACTIVITY

The overall budget in 2012 is expected to be in the order of 40 M€<sup>3</sup>, of which about EUR 39 millions under budget line 02 02 15 (European Earth observation programme GMES) and EUR 1 million under budget line 02 01 04 06 (European Earth observation programme (GMES) — Expenditure on administrative management).

A draft indication of budgets could be as follows:

| Activities  | 2012        |                           |
|---|-------------|---------------------------|
|   | Codes       | Commitments - Million EUR |
| <i>Mapping</i>  | GIO1.1-2012 | 3,7                       |
| <i>Early Warning Systems</i>                                    | GIO1.2-2012 | 0,6                       |
| <b>Total Emergency Management service</b>                       | GIO1-2012   | <b>4,3</b>                |
| <i>Pan-EU land cover</i>  | GIO2.1-2012 | 9,0                       |
| <i>Global Land Component</i>                                    | GIO2.2-2012 | 1,0                       |
| <i>Local component: other hot spots (biodiversity, ...)</i>     | -           | 0,0                       |
| <i>Access to reference data component</i>                       | -           | 0,0                       |
| <b>Total Land service</b>                                       | GIO2-2012   | <b>10,0</b>               |
| <b>Take up of services by users</b>                             | GIO3-2012   | <b>2,0</b>                |
| <b>GMES Space component</b>                                     | GIO4-2012   | <b>22,7</b>               |
| <b>TOTAL (Operational Credits)</b>                              |             | <b>39</b>                 |
| <b>Administrative Expenditures - Support to Policy measures</b> |             | <b>1</b>                  |
| <b>TOTAL</b>  |             | <b>40</b>                 |

<sup>3</sup> Subject to final adoption by the Council and the European Parliament of the EU budget for 2012

#### 4. WORK PROGRAMME 2012 – DETAIL OF ACTIONS

##### ACTION NO 1 – Emergency Management Service

###### GIO1.1-2012: GMES emergency management services - Mapping

Reference to the GMES Regulation

Article 3(1) point 1; Article 2(2)(a) third indent, emergency management; Annex, point 1.

Political priorities and link with other funding sources

This action will aim to ensure the seamless continuity of the operations of the emergency management service started within the 2011 work programme, without any gaps.

The objective of the GMES Emergency management service is to support users in the field of crisis management, in particular Civil Protection, Humanitarian Aid and External Action communities by providing them with information based on space data combined with other sources of data. It addresses both natural disasters (floods, forest fires, earthquakes, tsunamis, volcanoes, landslides, storms, ..) and man-made disasters (industrial, nuclear accidents, terrorism attack etc.), inside and outside the EU.

The Emergency management service will focus on the priorities defined by the Emergency Response Core Service Implementation Group and guidance from the GMES User Forum. It will be based on:

- the consultation of user communities building on precursor activities funded by ESA (TERRAFIRMA, RESPOND and RISKEOS), and by the EU (SAFER, PREVIEW)
- the preparatory action (LINK-ER project)
- existing operational activities at European and national level
- views expressed by the GMES User Forum
- the activities launched in 2011 for the conclusion of service contracts establishing the GMES Emergency Management Service
- technical developments in other GMES activities (e.g. in-situ, land, marine and atmosphere monitoring, security and climate change) which may contribute to enhancements of the GMES Emergency Management Service.

The details of these priorities and their relevance to the users will be validated by the Commission with the advice of the GMES User Forum. The interactions and synergies with other GMES-related services (e.g. the sectorial services namely, land, marine, and atmosphere and the horizontal services as security and climate whenever launched) and other activities (e.g. transport) will be ensured.

The **first priority** defined by the users and to be validated after consultation of the User

Forum is to ensure the continuity of the operational mechanism for delivering emergency mapping products **during the emergency response phase**, i.e.

- (i) **emergency response maps produced in rush mode** to show the impact, assess the damage and follow the evolution of the disaster in the hours and days after the crisis, and
- (ii) geographic **reference maps made available in rush mode** providing basic topographic maps on areas affected by the disaster, in particular on infrastructure and the key natural resources.

The **second priority is to support the other phases of the crisis management cycle**, in particular the prevention, preparedness and recovery phases, inside or outside EU, by providing pre-disaster or post-disaster mapping products, including refugee / IDP (Internally Displaced Person) maps under a non-rush mode. Taking into account the users' needs, higher priority will be given to the emergency products produced in rush mode.

## Description

### *Scope*

#### **Mapping in support to crisis management inside and outside EU, 3 main elements**

- **Mapping in rush mode service:** on-demand production and delivery **in rush mode** of geo-spatial information based on EO processed data, disaster extent and damage assessment (within 24 hours after user activation)<sup>4</sup> and reference maps<sup>5</sup> (within 6 hours after user activation)<sup>4</sup> over crisis area. This service must be available on a 24/7/365 basis with a minimum provision for a number of crises/year based on statistics from the precursor project and the International Charter (~50 activations per year). Priority will be given to this activity.
- **Mapping in non-rush mode service:** on-demand production and delivery in non-rush mode of geo-spatial information in support to the other phases of the disaster cycle (preparedness / prevention, recovery and reconstruction phases).
- **External validation:** independent validation and quality control of all generated products, archive, catalogue and dissemination.

The mapping service will be activated on-demand by the authorised users and National Focal Points which coordinate activations at MS level. The activation mechanism will build on the procedures implemented in the frame of the work programme 2011. **With full respect for the principle of subsidiarity** as referred in the GMES regulation<sup>1</sup>, this activation mechanism and the related operational procedural steps will ensure a coordinated management approach with all authorised users (in particular at national level but also at EU level). A coordinated mechanism fully respecting the command chains at EU and at national level will be ensured. Furthermore, the access to existing mapping products and reference data in Member States will be fully exploited depending on their availability at national level and in compliance with the INSPIRE directive. This will avoid any risk of potential duplication. By definition the activations being 'on-demand' and depending on the number of crises which cannot be predicted in advance, a **flexible mechanism** should be implemented.

<sup>4</sup> Target requirement as expressed by the users

<sup>5</sup> Combination of satellite-based data and existing reference data, when available

The service encompasses:

- (i) The operation of the 24/7/365 service focal point handling activations and the tasks of service coordination in case of a crisis, (ii) the administration of a quotas mechanism, (iii) the production and delivery of data and added-value information products in rush mode and non rush mode through service contracts signed in the context of the 2011 work programme, (iv) catalogue, archive and dissemination tasks, (v) validation and quality control tasks, including external validation through contract signed in the context of the 2011 work programme.

The quotas mechanism and a system monitoring the activations will be set up at the Commission level. It will be based on pre-defined envelopes allocated to each type of mapping service (rush mode and non rush mode) and adjusted dynamically, at least every six months, according to the real activations and depending on the specificities of the crisis (e.g. in case of a major crisis, exceptional measures may apply). In case of overconsumption or under consumption of the quota for rush products (less emergency activation), the quota for non rush products will be respectively decreased or increased accordingly. The Commission will also manage the list of authorised users.

The activations as described above

- will be placed by authorised users and will be analysed and authorised by the Commission based on pre-defined guidelines and the quotas status..
- The mapping service (either rush or non-rush mode) will be triggered based on the specifications adapted to the user request. Each activation will be linked to a number of criteria, in particular: the area of interest, the type of products (e.g. reference map, damage assessment map, other products in non rush mode), the type of satellite images, the activation mode (rush mode, non rush mode). Specific orders will be placed for each activation or a group of activations.
- Based on these specifications, the service provider will request the relevant space data and will generate the products
- The products will be delivered to the authorised users. Quality control and external validation will be carried out at various levels. Dissemination, catalogue and archiving are part of the system.

The rush mode service will maintain an on duty activity, available on a 24/7/365 basis, for the reception and handling of service requests by authorized users of the service. This on duty activity will be dimensioned to handle, at least, 50 rush mode activation requests per year. The service can be activated at any time during the day, including weekends, public holidays and both within and outside normal working times.

Expected output of the implementing measure

### **Mapping in support of crisis management inside and outside EU**

1. Operation of a 24/7/365 service focal point handling activations by users and service coordination tasks

2. On demand mapping in rush mode in support to emergency response to crisis and disasters inside and outside the EU, delivered to users within the demanded time frame and with necessary legends, interpretations on the maps
3. On demand mapping in non-rush mode in support to other phases of the disaster cycle (prevention, preparedness, recovery...) inside and outside the EU
4. Catalogue, archiving and dissemination of all generated products
5. External validation and quality control

#### Indicators

##### **Mapping in support of crisis management inside and outside EU**

1. Number of activations of the service by users in rush mode (for 'rapid mapping' during the response phase)
2. Number of activations of the service by users in non-rush mode for preparedness / prevention and recovery mapping
3. Number of maps produced in rush mode for the emergency response
4. Number of maps produced in non-rush mode for the preparedness / prevention and recovery phase
5. Number of satellite images produced
6. Timeliness in rush mode: average time between the activation and the first crisis product delivery highlighting the disaster extent
7. Results of validation/quality control of products
8. Evaluation by the users based on questionnaire (user satisfaction regarding the quality of the service)

#### Implementation mode

The Commission will implement the budget on a centralised direct management basis in accordance with Art 53 a) of the Financial Regulation.

The budget foreseen for this activity is **EUR 3.7 Million**.

According to Art. 4 of Reg. 911/2010, the Commission is in charge of the overall coordination of the GMES programme:

- The Commission (DG Humanitarian Aid and Civil Protection - ECHO) will ensure the operational coordination and interaction with authorised users, in particular national civil protection authorities for the operational activities and through the Civil Protection Committee for political coordination, humanitarian aid actors and EEAS (including EUSC). It will also validate compliance of service requests with agreed criteria and priorities for activation.
- The Commission (JRC) will be in charge of the technical coordination of the activities and it will provide technical support to Commission services. Its role will be to continue service procurement activities already started in 2011. The JRC will not be involved in the production of service outputs. The service provisions will be done by the contracted entities according to service contract. The Commission (JRC) will also monitor the

activations of the service by Member States and other authorised users, including international activations through DG ECHO and EEAS. It will implement and manage a quotas management mechanism based on priorities defined by the users and host a catalogue of all generated products.

Operation timetable

| <b>MILESTONE DESCRIPTION</b>   | <b>INDICATIVE QUARTER</b> |
|--|---------------------------|
| Service delivery   | Q1/2012 – Q4/2014         |
| The contracts signed in the frame of work programme 2011 are expected to be renewed up to 3 times. |                           |

Budget

| <b>ACTION</b> | <b>ABAC PROJECT REFERENCE</b> | <b>YEAR</b> | <b>BUDGET LINE</b> | <b>BUDGET</b> |
|---------------|-------------------------------|-------------|--------------------|---------------|
| Procurement   |                               | 2012        | 02.0215            | 3.700.000     |

## GIO1.2-2012: GMES emergency management services - Early Warning Systems

Reference to the GMES Regulation

Article 3(1) point 1; Article 2(2)(a) third indent, emergency management; Annex, point 1.

Political priorities and link with other funding sources

This action will focus on the **sustainability of the Early Warning System (EWS) EFAS (European Flood Awareness System) at European level**. EWSs in general are considered as a key in support to the preparedness phase, in order to better anticipate the probability of a crisis event occurrence and to be better prepared. The DG Humanitarian Aid and Civil Protection (ECHO) has contributed in the past to the development of several EWS at EU level, one of which is for floods - EFAS (European Flood Awareness System). The objective of this tool is to complement national EWSs by providing information in case of major crises (including cross-border crises) requiring coordinated response at European level.

**With full respect for the principle of subsidiarity**, this action will ensure a coordinated approach respecting the national mandates for the provision of the warnings through the national agencies indicated by the competent Member States' authorities (hydrological, meteorological, and other organisations with similar mandate). A coordinated mechanism fully respecting the command chains at EU and at national level (national relevant authorities, e.g. civil protections) will be ensured. So far the system has been developed by the JRC (Joint Research Centre of the European Commission).

The objective in 2012 is to ensure the continuity of the activities already started by JRC and DG Environment in 2003, taken partly over in 2011 and aiming at a fully operational system in the frame of GMES. This includes the future use of GMES Sentinel data, once available, in the EFAS system.

Description

*Scope*

### **Support to EU Early Warning System**

EFAS is strongly linked to meteorology, hydrological data and forecasts. The activities foreseen within the frame of GMES Initial Operations in 2012 should cover:

- Continuity of forecast activities:
  - o Provision of numerical weather forecasts, and pre-processing for running EFAS
  - o Running of EFAS in operational mode, twice daily, producing pan-European flood forecasts for potential floods 3 or more days in advance
  - o Preparing results for dissemination
- Collection of historic and near-real time river flow data including automated data

from National Hydrological Services, quality control and near-real time transfer of data to EFAS for storage in the EU-Flood GIS database, which is used to update real-time forecasts. Verification of past flood forecasts, and calibration and validation of the hydrological model used for EFAS.

#### Expected output of the implementing measure

- 1 Twice-daily pan-European flood forecasts (3 – 10 days) – complementary to national available information - provided to relevant entities indicated by the competent MS's authorities as national and regional hydrological services, 31 Participating States in the Civil Protection Mechanism (27 MS, 3 EEA (European Economic Agreement) states and 1 EU-candidate country (Croatia), and the European Commission, also available on a password protected web-interface
- 2 A daily updated pan-European overview of ongoing floods available on a public website
- 3 Making available the pan-European forecasts for potential use in the GMES Emergency Management Service and its rapid mapping products.

#### Indicators

1. Number of EFAS ‘warnings’ sent out to MS hydrological services, Participating States in the Civil Protection Mechanism and the Commission
2. Number of EFAS ‘watches’ sent out to MS hydrological services, Participating States in the Civil Protection Mechanism and the Commission
3. Evaluation by the users based on questionnaire (user satisfaction regarding the quality of the service)
4. Real warnings / False warning ratio

#### Implementation mode

The Commission will implement the budget on a **centralised direct management** basis in accordance with Art 53 a) of the Financial Regulation.

*The budget foreseen for this activity is **EUR 0.6 Million**.*

According to Art. 4 of Reg. 911/2010, the Commission is in charge of the overall coordination of the GMES programme. For the Emergency management service the coordination will be entrusted to DG Humanitarian Aid and Civil Protection (ECHO) with the technical support of the JRC.

- The Commission (DG ECHO) will further encourage the national Civil Protection authorities (through the existing Civil Protection Committee) to have a stronger coordination with national hydrological services in their use of EFAS and the longer term warnings provided there.
- The Commission (DG ENV) will ensure the co-ordination with the Member States involved in the Common Implementation Strategy of the Water Framework Directive, which includes the implementation of the Floods Directive through the activities of the established Working Groups.

- The JRC will be in charge of the technical coordination of the activities and it will provide technical support to Commission services. Its role will be to handle service procurement activities already started in 2011. The JRC will not be involved in the production of service outputs. The JRC will also be in charge of product validation and their dissemination to Commission services.

#### Operation timetable

| <b>MILESTONE DESCRIPTION</b>   | <b>INDICATIVE QUARTER</b> |
|--|---------------------------|
| Service Delivery   | Q4-2011 until Q4-2014     |
| The contracts signed in 2011 are expected to be renewed up to 3 times. |                           |

#### Budget

| <b>ACTION</b> | <b>ABAC PROJECT REFERENCE</b> | <b>YEAR</b> | <b>BUDGET LINE</b> | <b>BUDGET</b> |
|---------------|-------------------------------|-------------|--------------------|---------------|
| Procurement   |                               | 2012        | 02.0215            | 600.000       |

## ACTION NO 2: Land Monitoring Service

### GIO2.1-2012: Pan-European Land Cover monitoring service

#### Reference to the GMES Regulation

Article 3(1) point 1; Article 2(2)(a) fourth indent, land monitoring; Annex, point 2.

#### Political priorities and link with other funding sources

The Work Programme 2012 focuses on the Pan-European land cover component which can be considered as the most mature and consolidated part of the land monitoring service.

This action will aim to ensure the continuity of activities started in 2011.

The objective of the Land monitoring service is to provide users in the field of environment and other terrestrial applications with information based on space data combined with other sources of data. The service will also be of high relevance to Civil Protection and Humanitarian Aid work within the fields of Prevention, Preparedness and Disaster Risk Reduction, which is often also related to land use (e.g. building/no building etc.). It addresses a wide range of policies such as environment, agriculture, regional, development, transport, energy as well as climate change at EU level and European commitments to International Conventions. The Land monitoring service will focus on the priorities defined by the Land Monitoring Service Implementation Group and the results of consultation of user communities. The Land Service also builds on precursor activities (GEOLAND and GEOLAND2 which will continue to carry-out additional development of the service until the end of 2012), ESA GSE projects, Corine Land Cover, Land Fast Track precursor project), on preparatory action (Reference Data Access project) and existing operational activities at European level and national level. The details of these priorities and their relevance to users will be validated by the Commission with the advice of the GMES User Forum. The development of this service should ensure compliance with, and actively contribute to the development of, the relevant INSPIRE Implementing Rules and associated technical guidelines, in particular the relevant themes of Annex I.

The initial operations (2011-2013) should focus on the priority for multi-purpose information common to a large community of users, i.e. land cover/land cover change at various scale and periodicity, bio-geophysical variables for dynamic land monitoring, improved access to reference data. On this basis, four components have been identified for the Land service in GIO: (i) a Pan-European Land Cover component, (ii) a Global component producing bio-geophysical variables at global scale (iii) a 'Local' component providing very high resolution information on specific areas of interest and (iii) an access to reference data component building on INSPIRE architecture and useful for several GMES services.

- The Land monitoring service starts with the **Pan-European land cover component** which can be considered as the most mature and consolidated. It encompasses (i) continuity of Corine Land Cover (CLC) with a new exercise for the reference year 2012, (ii) production of 5 additional High Resolution (HR) Pan-European layers with specific land cover characteristics in complement to CLC, and (iii) support to harmonisation efforts of the MS in order to improve synergies between Pan-European and national land cover activities and

in support to the implementation of the INSPIRE Annex II Land Cover Spatial Data Theme. The 2012 Work Programme focuses on the production of the 5 High Resolution Pan-European layers which will be expected to be used in a second step (in 2012 and 2013) as input both for Corine Land Cover and the Urban Atlas production.

In complement to GIO, the update of the Urban Atlas (considered as part of the Land local component), will continue to be financed under FEDER in 2012 or 2013.

The acquisition of space data required for the Land Monitoring service, in particular the wall-to-wall Pan-European coverage of High Resolution images (10-30m resolution) acquired in 2011 and 2012, hereby called IMAGE 2012 (2012 being the Reference year), and required for the Pan-European component, will be carried out outside the funding frame of this action and work programme. It will be available to Member States' public authorities according to terms and conditions available at the website [http://gmesdata.esa.int/web/gsc/terms\\_and\\_conditions](http://gmesdata.esa.int/web/gsc/terms_and_conditions).

## Description

### *Scope*

The main objectives under the GMES Regulation in 2012 will be (i) to complement the High Resolution layers at Pan-European level started in 2011 on areas which were not covered in 2011 and (ii) to start the production of Corine Land Cover 2012 with the mapping of Corine Land Cover Change (2012 vs. 2006).

Given the fact that the wall-to-wall HR image coverage will be acquired in 2011 and 2012 the approach is to split the production of the 5 HR layers into regional blocks which are defined on the basis of availability of cloud-free images across the 39 European Environmental Agency (EEA) countries. It is anticipated that in 2012 approximately 2/3<sup>rd</sup> of the images will be delivered and processed, completing the Pan-European coverage acquisition started in 2011.

The service in 2012 will focus on the post-processing of images for producing a multi-temporal image mosaic, the production of primary products (bio-geophysical and variables), the production of the 5 High Resolution (HR) layers on additional areas as compared to WP 2011 and the verification and validation of the layers, and the initialisation of Corine Land Cover and Land Cover Change production. This type of land cover product is useful for elaborating additional information at European or national level.

The services/products covered in 2012 are:

- The **post-processing of space data and the automatic extraction of intermediate products** for the remaining 2/3<sup>rd</sup> of Pan-European coverage
- The **production of five high resolution layers** of 5 thematic layers with land cover characteristics (artificial surfaces, forest areas, agriculture areas, wetlands, water bodies) for additional areas which were not covered by the WP 2011. The production will be split into processing, verification and refinement (which are expected to be further completed in 2013). It will also include methodology consolidation for high resolution layers when required (e.g. agriculture areas, wetlands).
- The initialisation of Corine Land Cover and Land Cover Change mapping activities (which are expected to continue in 2013)

- Validation and quality control of products, notably by the use of relevant reference data in particular LUCAS 2012
  - Implementation of cataloguing, archiving and dissemination services for the generated land cover products based on SEIS (Shared Environmental Information System) principles and Inspire compliant.
  - Data and Service management.
- The approach will be based on a mix of centralised and decentralised activities and will maximise the national contribution to the verification and enhancement of the HR layers and Corine Land Cover mapping, depending on MS capacities. Synergies with national activities and datasets (e.g. national land cover, Land Parcel Identification System for the management of the Common Agriculture Policy) and harmonisation at European level will be enhanced as well. This is fully in line with the principle of subsidiarity.

#### Expected outputs of the implementing measure

- Pan-European Land cover activities**
1. Post-processing of space data and intermediate products based on automatic extraction for approximately 2/3<sup>rd</sup> of Pan-European coverage.
  2. Production of five high resolution layers with land cover characteristics for artificial surfaces, forest areas, agriculture areas, wetlands, water bodies for approximately 2/3<sup>rd</sup> of the Pan-European coverage.
  3. Catalogue and archive of all generated products, including an overview of dissemination services.
  4. Report on independent validation and quality control.

#### Indicators

1. Total area covered by cloud free mosaic of multi-temporal satellite imagery
2. Number of bio-geophysical variables extracted by automatic processing
3. Total area covered by the high resolution data
4. Number of high resolution layers produced and for each layer the number of land cover characteristics produced
5. Number of downloads and page views of the validated land cover datasets
6. Results of validation/quality control of products<sup>6</sup>
7. User satisfaction survey regarding the quality of the service

#### Implementation mode

According to Art. 4 of Reg. 911/2010, the Commission is in charge of the overall coordination of the GMES program. Art. 4 (5) stipulates that the coordination of the technical implementation of the GMES services shall be entrusted to competent Union bodies or intergovernmental organisations. For the Land monitoring service the coordination of the Pan-European and the local components will be entrusted to the EEA which has already a long experience in these activities (Corine Land Cover and GMES Land Fast Track precursor). In this coordination activity, EEA will take into account the requirements of all relevant user

<sup>6</sup> The target of the expected overall accuracy for land cover products is 85% as expressed by user community

communities including the emergency service requirements.

The Commission will implement the budget on a **centralised indirect management** basis.

The budget implementation will be delegated to the EEA (European Environment Agency) in accordance with the delegation agreement signed in 2011. The EEA will use the delegated budgets to (i) conclude grant agreements with all the Member States which will cover the national inputs, and (ii) to conclude procurement contracts for the aggregation of these products at European level. The EEA will take into due account the synergies with national activities and existing data sets, harmonizing national and European approaches, building on existing national capacities and providing a value added at national and European level.

The budget foreseen for this activity is **EUR 9 Million**.

#### Operation timetable

| <b>MILESTONE DESCRIPTION</b> | <b>INDICATIVE QUARTER</b> |
|------------------------------|---------------------------|
| Product delivery             | Q1/2012 – Q4/2013         |
|                              |                           |

#### Budget

| <b>ACTION</b>                        | <b>ABAC PROJECT REFERENCE</b> | <b>YEAR</b> | <b>BUDGET LINE</b> | <b>BUDGET</b> |
|--------------------------------------|-------------------------------|-------------|--------------------|---------------|
| delegation agreement (Art. 54 of FR) |                               | 2012        | 02.0215            | 9.000.000     |

## GIO2.2-2012: Global Land Component

### Reference to the GMES Regulation

Article 3(1) point 1; Article 2(2)(a) fourth indent, land monitoring; Annex, point 2.

### Political priorities and link with other funding sources

The objective of the Global Land component of the Land Service is primarily to support EU policies at international level and the European commitments under international treaties and conventions, such as the three Rio conventions on Climate Change, Desertification and Biodiversity. The Global Land component will also be a major contribution to the Global Earth Observation System of Systems (GEOSS); in particular, to the implementation of the task SB-02 "Global Land Cover" of the GEO (Group on Earth Observation) 2012-15 Work Plan and other related ones<sup>7</sup>.

The objective will be to provide products on the status and evolution of land surface at global scale with the provision of terrestrial parameters (e.g. bio-geophysical, radiation and water). The Global Land Component will also allow the integration of these parameters into land data assimilation schemes for providing relevant information on biomass, carbon and water cycle which are relevant for addressing the policies indicated here after.

Production and delivery of the parameters will take place approximately 3 days after the data acquisition time and will be complemented by the constitution of long term time series. A specific attention will be given to continuity and consistency of production of this phase with previous pre-operational activities already serving the policies described here after, in particular avoiding gaps in the operational phase and ensuring time consistency of the generated parameters. The service should also allow the re-analysis of the data.

#### Priority Policies:

- 1) The Global Land Component may provide information on the land component needed for the GMES Climate Change Monitoring service in support to the adaptation and mitigation policies;
- 2) The Global Land Component will generate input products for the global crop monitoring system in place for the implementation of the EU Common Agricultural policy and for the implementation of the Food Security policy<sup>8</sup>;
- 3) It will ensure continued provision of products to support the European Development policy in the implementation of the EU activities on the EU-Africa partnership: e.g. "GMES and Africa"-related projects as AMESD (African Monitoring of the Environment for Sustainable Development) and MESA (Monitoring for Environment and Security in Africa);

<sup>7</sup> AG01: Global Agricultural Monitoring and Early Warning, BI 01: Global Biodiversity Observation (GEO BON) and CL 02: Global Carbon Observation and Analysis

<sup>8</sup> For example, the MARSOP (Monitoring Agricultural ResourceS Operational activities) project funded by Directorate General Agricultural and Rural Development of the Commission

- 4) The information will also support EU development policies on Forest, Fibre and Fuel Resources evaluation, Resource Efficiency, Water Management, Hydrology environment, Biodiversity, Desertification and Drought Monitoring;
- 5) It will support the Earth system modelling with a focus on the land / atmosphere processes, the related carbon and water fluxes which are also highly relevant for the EU's climate policy.

## Description

### *Scope*

The Global Land component of the Land service will focus in the WP 2012 on the delivery of bio-geophysical terrestrial parameters which are mature and of high priority for ensuring the immediate continuity of the activities serving the identified policies. The parameters have been selected through consultation with stakeholders. It builds on the results of FP 7 projects as GEOLAND2 (BioPar service), and other FP7 "GMES and Africa" related projects, on the EUMETSAT LANDSAF developments, on the JRC policy support activities and the GMES User Forum. The first activity to be launched in 2012 will cover the Agriculture sector, the support to the food aid and international cooperation policies, with the production of a set of biophysical parameters relevant for crop monitoring, crop production forecast, carbon budget, biodiversity and climate change monitoring<sup>9</sup> at worldwide level as well as additional biophysical parameters relevant for environmental monitoring purposes in Africa. These parameters will also be available for use in other applications.

The following activities will be initiated in 2012:

- ñ The production of spatial and temporal compositing of global systematic observations.
- ñ The timely production of the bio-geophysical terrestrial parameters at worldwide and African levels that are already being delivered in a (pre-) operational mode according to the user requirements of the above-mentioned applications, and subject to regular update, i.e. for example NDVI (Normalized Difference Vegetation Index), Fcover (Fraction of Vegetation Cover), FaPAR (Fraction of Absorbed Photosynthetically Active Radiation), LAI (Leaf Area Index), albedo and land surface temperature at global scale. This initial list is expected to be completed with additional products that will have demonstrated maturity and user acceptance during the forthcoming months. The typical time integration and update frequency will be 10 days for the output products.
- ñ The support to the integration of the parameters into land surface modelling schemes.

<sup>9</sup> In the context of climate change, particular regards should be dedicated to the question of "attribution" which seeks to establish the most likely cause for a detected change in the climate with some level of confidence. Attribution will provide a link between Disaster Risk Reduction and Climate Change through information on whether high impact environmental disasters (such as severe weather events, flooding, etc) are attributable to natural climate variability or non-natural effects. It will also provide a tool for evidence based climate change adaptation policies.

- ñ The reprocessing of historical data to ensure re-analysis and inter-annual comparisons
- ñ The archiving and cataloguing system, including the metadata production following standards (in particular INSPIRE)
- ñ The data dissemination service (timely provision of data to the operational users as well as access to archived products)
- ñ The reviewing, validation and quality control of the production chains, and of the data dissemination service.

#### Expected outputs of the implementing measure

##### **Global Land Component activities**

1. Space input data acquisition and internal archiving
2. Pre-processing of space data if needed, including compositing
3. Timely production of bio-geophysical parameters
4. Production of historical archive of bio-geophysical parameters
5. Cataloguing and archiving of all generated products, including an overview of dissemination services.
6. Data dissemination using INSPIRE download service and EUMETCAST/GEONETCAST service
7. Maintenance of the production service
8. Service evolution based on research results, including FP 7 outputs
9. Independent validation and quality control of all aspects of the service.

#### Indicators

1. Number of bio-geophysical parameters produced
2. Service availability: number of on-time deliveries
3. Uptake of the parameters by institutional services and other institutions
4. Results of the validation/quality control of the process

#### Implementation mode

The Commission will implement the budget on a **centralised direct management** basis in accordance with Art 53 a) of the Financial Regulation.

The Commission will launch a procurement procedure for this activity. The service will use as much as possible the existing capacities available in the EU.

*The budget foreseen for this activity is **EUR 1 Million**.*

According to Art. 4 of Reg. 911/2010, the Commission is in charge of the overall coordination of the GMES programme. For the Global Land Component, the Commission (JRC) will be in charge of the technical coordination of the activities and it will provide technical support to Commission services. The Commission will carry out service procurement activities and will not be involved in the production of service outputs.

Operation timetable

| <b>MILESTONE DESCRIPTION</b>          | <b>INDICATIVE QUARTER</b> |
|---------------------------------------|---------------------------|
| Contract notice                       | Q1/2012                   |
| Invitation to tender and notification | Q1/2012                   |
| Evaluation of tenders                 | Q3/2012                   |
| Signature of contract                 | Q3/2012                   |
| Products delivery                     | Q4/2012 – Q3/2014         |
| Total duration (months) 24 months     |                           |

Budget

| <b>ACTION</b> | <b>ABAC PROJECT REFERENCE</b> | <b>YEAR</b> | <b>BUDGET LINE</b> | <b>BUDGET</b> |
|---------------|-------------------------------|-------------|--------------------|---------------|
| Procurement   |                               | 2012        | 02.0215            | 1.000.000     |

### ACTION NO 3: Take-up of services by users

#### GIO3-2012: Take-up of services by users

Reference to the GMES Regulation

Article 3(1) point 2; Annex, point 7.

Political priorities and link with other funding sources

The GMES regulation underlines the need to implement measures aiming to support the take-up of services by users, including the implementation of technical interfaces adapted to the specific user environment, training and communication.

Ensuring the sustainability and continuity of services is a key for the success of GMES. However, supporting the take-up of users is also essential for accompanying the transition to the operational service phase and for ensuring the key role of GMES in supporting policy making. Very often the users are not fully aware of the potential of Earth Observation information and sometimes there is a resistance to new technologies which may hamper the success of GMES services.

Therefore, this action in 2012 aim to implement specific measures which are essential to stimulate and facilitate the use of GMES products, data and information, by the users and the interfaces between the GMES services and the user-specific environment / information flow<sup>10</sup>. The user uptake action will be essential to demonstrate the added value of GMES services and to strengthen the *capability building* element of GMES. In 2012 work programme, these measures will be mainly addressed to the public user sector both at EU and at national level, addressing a wide range of policies such as environment, agriculture, regional, development, transport, energy as well as climate change. This action will also be closely linked to the User Forum process.

The approach builds on the experience and the outcome of GMES precursor activities such as the LINK-ER Preparatory Action or GRAAL<sup>11</sup> or Doris\_Net<sup>12</sup>.

Description

*Scope*

This action will start with an analysis aiming to define the best strategy to reach the users at various levels (European, national, local/regional) and adapted to various communities, based on lessons learnt from GMES precursor activities.

On this basis a range of activities will be carried out:

- Communication and awareness raising activities to disseminate the information on GMES services to various communities at national, regional or European level. This should be closely linked and coordinated with existing thematic or regional networks or user groups.

<sup>10</sup> In order to guarantee consistency and, where appropriate, to facilitate the availability of these products and services within the Commission, their compliance with the specifications of the Commission internal geo-portal and activities coordination within the framework of the COGI (Interservice Committee for Geographical Information) should be ensured.

<sup>11</sup> FP7 project: "GMES for Regions: Awareness and Access Link"

<sup>12</sup> FP7 project: "Downstream Observatory organized by Regions active In Space – Network"

It encompasses:

- The elaboration of communication material dedicated to users, maximising the use of already existing communication packages (video, press pack, ...)
- Taking stock of the current developments to provide access to Earth Observation data implemented in the context of the GEO initiative and more specifically to build the GEO Common Infrastructure (GCI).
- The organisation of user workshops and GMES presentations/events at national level to support GMES coordination activities upon request of national coordinators
- Support to the integration of GMES services in user specific environments and organisations, including
  - the support to functional workflow integration, formatting or conversion toolboxes, and information-exchange protocols needed for users to access the GMES services and to be ready for an operational use of the service deliveries in support of their activities
  - the support to the integration of user data assets to enhance service outputs (e.g. topographic, cartographic data sets, or other user specific datasets).
- User training activities: elaboration of tutorials, organisation of training sessions or specific GMES sessions (in already existing training courses) at European and/or national level (generic or thematic), building on existing material and experience
- Mainstreaming of GMES services in existing monitoring and reporting systems in order to stimulate the use of GMES services and demonstrate their added-value based on pre-identified test cases. This activity encompasses the preparation of a series of test cases in close collaboration with users from various user communities, based on very interactive demos which will demonstrate how the GMES products can help them in their monitoring, management or decision making tasks. The test cases material will be disseminated on any adequate media and will be presented to other potential users. Users will be invited to share their experience with others thus stimulating the exchange of experience and good practices between users, and the creation of user communities of interest e.g. through thematic or regional clusters.
- User feedback: monitoring of the use of the services should be presented thanks to the collection of user feedback on the adequacy of the GMES service/products for their own use. The performance of the service will be measured in terms of timeliness of delivery, product usefulness and quality of the products. The user feedback will be gathered through a series of interviews, the collection of 'Frequently Asked Questions' or by organising specific technical workshops, user groups' discussion etc.

Expected outputs of the implementing measure

1. Training and communication support material
2. Technical interfaces adapted to specific user environment
3. Increased awareness of GMES value added services/products
4. Increased number of GMES service users

Indicators

1. User satisfaction surveys
2. Workshop/Communication events' attendance

#### Implementation mode

The Commission will implement the budget on a **centralised direct management** basis in accordance with Art 53 a) of the Financial Regulation.

This activity will be implemented directly by the Commission via calls for tender.

*The budget foreseen for this activity is **EUR 2.0 Million**.*

#### Operation timetable

| <b>MILESTONE DESCRIPTION</b>      | <b>INDICATIVE QUARTER</b> |
|-----------------------------------|---------------------------|
| Tendering procedure               | Q3-Q4/2011                |
| Signature of contract             | Q1/2012                   |
| Products delivery                 | Q4/2012 – Q4/2013         |
| Total duration (months) 24 months |                           |

#### Budget

| <b>ACTION</b> | <b>ABAC PROJECT REFERENCE</b> | <b>YEAR</b> | <b>BUDGET LINE</b> | <b>BUDGET</b> |
|---------------|-------------------------------|-------------|--------------------|---------------|
| Procurement   |                               | 2012        | 02.0215            | 2.000.000     |

## **ACTION NO 4: Space Component**

### **GIO4-2012: Space Component**

Reference to the GMES Regulation

Article 3(1) point 5; Article 2(2)(b); Annex, point 10.

Political priorities and link with other funding sources

The GMES initial operations (2011-2013) phase - following the build-up-phase - marks the next step towards reaching a fully operational GMES Space Component.

The launch of first Sentinels is planned before the end of 2013 and therefore preparatory activities are needed for the build up. Funding from the GMES Regulation is included in the amended Delegation Agreement between the European Commission and ESA and will complement the funds from FP7. The GMES Committee will be kept informed about the measures to be agreed by the Joint Monitoring Board under the Delegation Agreement.

The GMES Regulation complementary funding shall ensure the operations and development of the GMES Space Component (GSC) (Annex 1, pt.10).

Description

*Scope*

The emphasis will be dedicated to the preparation of initial operations of Sentinel-1-2-3 and their data generation, management, distribution, and access to GMES Contributing Missions (GCMs) capacity.

The GMES Space Component Initial Operations comprise the following elements:

- Sentinel ground segment contract extension;
- Sentinels Operations, routine maintenance and operational set-up;
- Securing timely availability of B-launchers.

This will be implemented

- in line with the information and data policy referred to in the GMES Regulation in response to the GSC System Requirements Document, taking due account of the access rights of the EU Member States and of the access rights granted to the ESA Participating States in the Declaration on the GSC programme.

Implementation mode

According to Article 4.4 of the GMES Regulation, technical coordination and implementation of the GMES space component shall be delegated to ESA, relying on the European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT), where necessary.

The Commission delegates the implementation of the budgets earmarked for the GMES space

component to ESA through the delegation agreement concluded under Article 53d of the Financial Regulation. The amendment to this delegation agreement signed in June 2011 includes the GMES Regulation<sup>1</sup> additional contribution.

*The budget foreseen for this activity is **EUR 22.7 Million**.*

#### Operation timetable

| <b>MILESTONE DESCRIPTION</b>          | <b>INDICATIVE QUARTER</b> |
|---------------------------------------|---------------------------|
| Amended delegation agreement with ESA | Q2/2011                   |
| Advance payment                       | Q1/2012                   |
|                                       |                           |

#### Budget

| <b>ACTION</b>                         | <b>ABAC PROJECT REFERENCE</b> | <b>YEAR</b> | <b>BUDGET LINE</b> | <b>BUDGET</b> |
|---------------------------------------|-------------------------------|-------------|--------------------|---------------|
| Delegation agreement (Art. 53d of FR) |                               | 2012        | 02.0215            | 22.700.000    |

## 5. SUPPORT FOR GMES RELATED POLICY MEASURES

This chapter details measures which are planned to be launched or continued in 2012 to implement the GMES Regulation.

These measures will be funded under the "Expenditure on administrative management" budget line (up to EUR 1 million).

### 5.1. Support for the operation of the User Forum (including work of possible facilitators)

The Article 17 of the GMES Regulation provides the legal basis of the User Forum. The User Forum is a dedicated body advising the Commission with regard to the definition and validation of user requirements and to the coordination of the GMES programme with its public sector users. The Commission will have to **organise User Forum meetings; in addition, support activities by thematic facilitators and related technical working groups** may need to be supported.

### 5.2. Support for GMES Data and Information Policy (including the preparation of delegated acts)

The acquisition, processing and exploitation of Earth monitoring data is at the centre of GMES activities making the access to GMES data and information a fundamental policy issue. The GMES Regulation confers to the Commission the power to adopt delegated acts for the purpose of providing for a data and information policy framework. Implementing measures concerning GMES data security shall be adopted by the Commission through comitology procedure. These activities could involve the procurement of study services and/or the appointment of group of independent experts.

### 5.3. Support for the future Certification of GMES services

According to Article 5.3 of the GMES Regulation the Commission may define or validate appropriate procedures for the certification of the production of data within the framework of the GMES programme and shall ensure that these procedures are implemented in the contracts with service providers. The Commission will examine this issue in detail with a view to consulting the User Forum. **One or more supporting studies** to assess available standards and options for cost-effective implementation of this provision of the Regulation may be carried out in 2012.

### 5.4. Support to the interim evaluation of the GMES programme

According to the Article 14 of the GMES Regulation, the Commission shall monitor and evaluate the implementation of the operational actions. In this respect, the Regulation establishes that the Commission shall submit to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions an interim evaluation report by 31 December 2012. To this aim, **one or more supporting studies** may be performed to monitor and evaluate the implementation of the first phase of GMES programme operations started in 2011.

## **5.5. Legal services for supporting the implementation of GMES programme**

Given the phasing in of GMES into operational activities, the implementation of GMES programme could necessitate the analysis of legal issues. To address these questions, legal assistance may be sought in the form of legal service procurement, studies and/or appointment of experts.