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COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS

"Global Monitoring for Environment and Security (GMES): we Care for a safer planet"

IMPACT ASSESSMENT

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IMPACT ASSESSMENT

EXECUTIVE SUMMARY

This Impact Assessment has been prepared by the Commission services to support the Communication entitled "Global Monitoring for Environment and Security (GMES): we Care for a safer Planet."

Substantial R&D effort has been invested on Earth observation by the EU, the European Space Agency (ESA) and their respective Member States to develop infrastructure and pre-operational services. It is now time to guarantee their sustainability, to bring together actors from different institutional nature, to ensure proper representation of the EU Member States and to associate other countries involved.

To achieve this goal, the GMES initiative should be implemented operationally through the establishment of an EU-led programme, GMES. The objective of GMES is to provide services allowing access to accurate environmental and security data and information, tailored to the needs of a wide range of users.

An extensive stakeholder consultation, which started with the 2005 Communication "From concept to reality", has indicated that the following major problems are hindering the progress towards the realisation of the political and operational goals of GMES:

- despite the user-driven character of GMES and the establishment of expert groups (known as service implementation groups), there is currently no formal process to involve the users in the definition of the scope and architecture of the services;

- equally, there is no process to consolidate the contributions of the various partners in the development of GMES, which could result in a duplication of efforts in Europe. In this context, it should be remembered that Member States and intergovernmental organisations, in particular ESA, have been investing significant sums in earth monitoring activities. Nevertheless, a common approach is still missing among co-existing frameworks at EC, intergovernmental and national level which all have separate decision and financing mechanisms;

- GMES is currently a set of research projects financed by the EU, ESA and Member States budgets. These projects aim at developing services and infrastructure, but cannot ensure a continuous and sustainable flow of information in an operational environment.

This baseline would undermine users' and industrial confidence in GMES. GMES would continue in the form of research projects, without an overarching governance framework for the coordination of the contributions from different GMES partners.

The main objectives of the 2008 Communication are therefore to

- make proposals for the overall programmatic approach and the governance of GMES as a whole and of its service and infrastructure components; and

- indicate the willingness of the Commission to propose a Basic Act establishing the EU GMES programme, without prejudging future financial decisions.

This two step approach, consisting of a Communication published in 2008 and a proposal for a basic legal act published in 2009, is considered of paramount importance for the success of GMES for strategic reasons, as it is essential to use the current momentum created by the French presidency to convey the political messages contained in the Communication already in 2008, with a view towards a providing the (political) grounds for a comprehensive legal act for the initiative in 2009. Further, the Communication will constitute a decisive input for ESA Ministers that will have to make their decision concerning the continuation of GMES space infrastructure development in November 2008.

The specific objectives of the Communication are to:

(1) define a transparent and sustainable governance framework that contains a clear division of the roles of the *partners* in the GMES partnership, based on the principle that GMES should use to the largest extent possible existing capacities;

(2) guarantee user uptake, in particular through constant involvement of users so that GMES remains *user driven;*

(3) *reassure stakeholders* about the EU commitment to GMES in the sensitive phase of demonstration which precedes the move to operation;

(4) outline how the governance and financing framework can be *implemented in a reasonable timeframe*.

In addition to the baseline described above, the Impact Assessment defines the following options concerning the sustainability of financing (S) of service provision and contribution to infrastructure development and operations beyond research:

- No action, S0-option: The EU continues to limit its financial contribution to GMES to research funds.

- Option S1: same as the previous option until 2013, but a programme is proposed in the context of the preparation of the next financial framework. A gap is left between the preparatory action (2008-2010) and 2014;

- Option S2: a Community programme is proposed in due time to bridge the gap between 2011 and 2014.

Concerning the roles and responsibilities of different actors (governance scheme- G), policy options at hand are:

- No action G0 option: No specific governance structure is maintained within the Commission in addition to the structures for the management of research funds.

- Option G1: The Commission takes strong political and managerial control and is in charge of the management of the GMES programme, a formal process for the compilation of user requirements and of the coordination of the contributions of various GMES partners which continue to act according to their mandate and own governance scheme.

- Option G2: The Commission could propose to create a new external entity (e.g. a Community agency, or to extend the mandate of an existing Community entity) to manage the programme on its behalf.

- Option G3: A single governance body managing all GMES elements and representing all stakeholders is established.

- Option G4. The responsibility for overall programme management is delegated to the ESA.

The baseline scenario described above would correspond to a combination of the no change S0-G0 options. It serves as the benchmark for the impacts of the other scenarios. The combination of options on Sustainable funding and Governance can be summarised as follows and leads to the further analysis of four scenarios.

	G0	G1	G2	G3	G4
S0	Base line	Discarded	Discarded	Discarded	Discarded
S1	Discarded	Scenario 1	Scenario 2	Discarded	Discarded
S2	Discarded	Scenario 3	Scenario 4	Discarded	Discarded

All combinations involving options S0 and G0 are discarded because they correspond to a large extent to the baseline described above. Finally, all combinations involving option G4 have been discarded for two main reasons. First, the governance framework must respect the role of the Commission as defined in the EC Treaty and the jurisprudence of the European Court of Justice concerning the institutional balance within the EC. Consequently, it is not possible that the Commission delegates the political responsibility for coordinating and managing the GMES programme to an external entity, such as ESA. Additionally, the implementation of GMES extends beyond the technical capacity and mandate of ESA. In particular, although ESA is assigned a key coordination role for the space component, for political, practical and legal reasons, it cannot be delegated the management of the in situ and service components.

The combination of options that are not discarded are analysed in the light of the specific objectives of the Communication as set out in the table below.

Objectives				
	Transparent and sustainable governance framework	Users buy-in	Stabilisation of industrial base (upstream and downstream)	Feasibility in needed timeframe
Scenario 1	+	+	-	+
Scenario 2	+	+	-	--
Scenario 3	++	++	++	+
Scenario 4	+	++	++	--

The timely submission of a proposal for a Community programme to ensure continuity after the preparatory actions, as foreseen in Scenario 3, seems to best fit the Communication

objectives and best respond to stakeholders' concerns expressed so far. Its combination with an internal Commission management structure would minimise implementation obstacles.

1. SCOPE OF THE IMPACT ASSESSMENT

1.1. What is GMES?

The objective of GMES is to provide services allowing access to accurate environmental and security data and information, tailored to the needs of a wide range of users such as European and national policy makers, scientists, companies, health and environmental agencies, NGOs and private citizens.

GMES will deliver services under the supervision of the EU in the fields of land, marine and atmosphere monitoring as well as in support of emergency and security management. The GMES Bureau, whose task it is to federate the user needs proceeded with a consultation of the various user communities in 2006/2007. Annex II of this impact assessment identifies the consolidated needs as expressed by users for (i) monitoring of the earth components (land, marine and atmosphere) and (ii) a contribution to emergency and security management.

GMES is conceived as a system of systems and its development and implementation are based on maximising the use of existing European capacities. The EU concentrates its actions on filling the gaps in full respect of the subsidiarity principle. As such, GMES is a partnership involving different actors:

- the Commission, acting on behalf of the European Communities,
- agencies of the EC, in particular the European Environmental Agency (EEA) the European Maritime Safety Agency (EMSA), and the European Agency for the Management of Operational Cooperation at the External Borders of Member States ,
- the European Space Agency (ESA) that will implement the space component of GMES,
- EUMETSAT, which could operate space observation systems on behalf of the EC;
- owners and operators of space and in situ observation infrastructure that produces data needed for GMES services;
- GMES service providers,
- Users, including downstream service providers and European and national authorities.

While the first objective of GMES is to enhance the available Earth observation-based information to the benefit of informed policy making, it is expected that, once the information of GMES services is fully and openly available, it will allow the development of a downstream sector where value-adding service providers will use them to develop and provide tailor-made services for their own customers. For example, the GMES Atmosphere Services can be used as an input by value-adding companies to produce targeted air quality monitoring information to local customers.

Likewise, the combination of GMES land monitoring service and meteorological information will allow the marketing of precision farming information tools to farmers. This market will develop only if potential enterprises are confident that the available services will be sustained on a long-term basis.

The observation data necessary to feed the catalogue of GMES services are derived from observation infrastructure, which is divided into space-borne infrastructure and "in situ" infrastructure, the latter including seaborne, airborne, or ground-based data. Many of these observation systems already exist and have been developed by Member States for their own needs, either directly or through intergovernmental organisations. The challenge for GMES is therefore two-fold:

- create a system of systems based on a coordination of existing capabilities and the development of new ones where gaps are identified;

- make these systems sustainable, which means ensuring the availability of infrastructure (and of the services derived from data collected through that infrastructure) on a long-term basis.

The socio-economic case for GMES, or GMES as the initiative has been called until now, was demonstrated by several studies. Annex III to the Impact Assessment gives some details on these studies, both in terms of general benefits and, more particularly, on the expected impact on downstream industry.

1.2. Defining the scope of the analysis

The decision to implement GMES (now GMES) has already been taken. In a Resolution in 2001, it was mentioned that the Council "URGES the Commission to start, in close coordination with the ESA, the initial period of global monitoring for environment and security (GMES), […] STRESSES the importance of the initial period in preparing the next phase of GMES, aimed at achieving by 2008 an operational and autonomous European capability for global monitoring for environment and security based on a sound cost/benefit assessment and avoiding any overlap with activities carried out under the common foreign and security policy".

The decision to implement GMES is therefore beyond the scope of the Communication and consequently of the present impact assessment analysis. Instead, the Communication addresses the issues of governance and funding that need to be clarified in order to ensure the operational implementation of GMES within a reasonable time frame.

As such, the Communication is not intended to create any financial impact on the EC budget whatsoever and it does not amount to a formal proposal for the governance and funding of GMES. As outlined in the Communication, the formal proposal for a Basic Act establishing a GMES programme is expected to be tabled in 2009 by the Commission. The Impact Assessment accompanying this Commission proposal for a Regulation will analyse the financial impact in a detailed manner. In Chapter 7 of the Communication it is explained that the share of the EU budget will depend on the scope of the activities funded and managed at EU level.

This two step approach, consisting of a Communication published in 2008 and a proposal for a Basic Act published in 2009, is considered of paramount importance for the success of GMES for the following reasons:

- For strategic reasons, it is essential to use the current momentum created by the French presidency to convey the political messages contained in the Communication already in 2008, with a view towards a providing the (political) grounds for a comprehensive legal act for the initiative in 2009. These messages include the way forward for the establishment of a GMES programme, objectives for a GMES data and information policy and the governance and financing of GMES. It is of key importance to give this message in 2008 in order to avoid that other stakeholders (in particular States participating in the GMES Space Component Programme of ESA) reconsider planned investments due to the lack of progress at Community level (see also the bullet below);

- the Communication will also constitute a decisive input for ESA Ministers that will have come to a decision concerning the continuation of GMES space infrastructure development in the framework of the GMES Space Component Programme in November 2008;

- it cannot be excluded that the basic legal act published in 2009 will not comprise all the aspects that are covered by this Communication;

- a two step approach was followed in previous cases in order to structure the debate concerning Community actions in complex high tech sectors, including electronic communications[1] and the Shared Environmental Information System[2];

- the Commission has received a mandate from Council in the Resolution on the European Space Policy of 21 May 2007 to propose appropriate mechanisms for the financing and effective management of GMES in 2008;

- in its the Resolution "Taking forward the European Space Policy" of 26 September 2008, the Council welcomed "the intention of the Commission to address all of these issues in a Communication to be adopted by the end of October 2008, having consulted with the main stakeholders, in particular agreeing with ESA an overall programmatic approach for the GMES Space Component."

The objective of the GMES Communication is thus to give a political message and to establish a basis for further discussions and consolidation of the political consensus among the various partners involved in this initiative. The Communication does not to create any financial commitments for the Commission and does in no way prejudge future financial decisions concerning GMES.

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1 See the Communication on the Review of the EU Regulatory Framework for electronic communications networks and services, COM(2006) 334 of 29 June 2006 that preceded the proposals for an amendment of legislative acts tabled on 13 November 2007.

2 See the Communication entitled "Towards a Shared Environmental Information System (SEIS)", COM(2008)46 final of 1 February 2008 that will eventually be followed b a revision of the Standardised Reporting directive 91/692/EC.

In line with the principle of proportionality, the present Impact Assessment is framed within the scope outlined in the paragraphs above. It goes without saying that all subsequent measures eventually proposed, after further discussions with stakeholders on the basis of the orientation defined in the Communication, will be subject to an assessment of their own impact, including a careful evaluation of their costs. As it is currently foreseen that a proposal for a Basic Act establishing the GMES Programme could be published in 2009, the relating Impact Assessment will have to be prepared in the first half of next year, at the latest.

2. PROCEDURAL ISSUES AND CONSULTATION OF INTERESTED PARTIES

2.1. Organisation and timing

This Impact Assessment has been prepared with reference to the following Commission Legislative and Work Programme priority item for 2008: GMES Communication. The foreseen adoption of the Communication is November 2008.

Work on the Impact Assessment started in 2006 by an intensive consultation process summarised below, which fully meets the Commission's standards. In parallel, an analysis of external studies was performed and a new study was launched to have a clear picture of the competitiveness of the existing EU GMES downstream sector of Earth observation-based service industries, and of the potential impacts that the GMES services might have on this market. An Inter-service Steering Group was established at the end of 2007 by enlarging the existing GMES Bureau Steering Committee (AGRI, FISH, RELEX, DEV, ECHO, AIDCO, TREN, JLS, TAXUD, OLAF, REGIO, ESTAT, RTD, INFSO, ENV, JRC) to horizontal services (Secretariat-General and DG Budget). This Group met three times between February and July 2008 and written comments were exchanged between meetings.

On 3 September 2008, the draft Impact Assessment was discussed with the Impact Assessment Board, that sent its opinion to DG ENTR on 10 September 2008. The Impact Assessment was re-submitted to the Impact Assessment Board on 1 october 2008. The Impact Assessment Board adopted its second opinion on 14 October 2008. The recommendations from the Impact Assessment Board are reflected in the following parts of the present document:

- existing budgetary and political commitments of the Commission with regard to GMES are explained in detail in chapter 3.2, which now also contains an overview of the role and functioning of the GMES Bureau, and Annex IV;
- the added value of the Communication is underlined in Chapter 1.2.;
- it is made clear that the Communication does not prejudge future financial decisions concerning GMES in chapter 1.2;
- a specific option concerning management of the programme by ESA has been defined in Chapter 5.2.;
- the analysis of Scenario 1 (internal Commission management through a dedicated internal structure) has been deepened significantly;

- stakeholder involvement has been described in more detail throughout Chapter 6.

2.2. Consultation and expertise

A number of external studies, some specifically targeting GMES and others Earth observation from a more general perspective, are available and have been analysed in support of this impact assessment. A list of these studies is presented in Annex 1[3].

2.3. Stakeholders consultation

In 2005 the Commission issued a Communication entitled "GMES, from concept to reality", which outlined the roadmap towards the availability of first pre-operational services by 2008.

In 2006 the GMES Bureau was created by Commission decision as part of the Directorate General for Enterprise and Industry in the European Commission. The Bureau has the task of federating the user needs and preparing the transition of GMES to operational status, which implies preparing the necessary financing and associated governance scheme.

Since then a wide consultation process with stakeholders has taken place:

- the preparation of each service (land, marine, emergency, atmosphere, security) was initiated by a thematic workshop gathering users of the future service;

- except for the Security domain which raises specific political and institutional issues, the workshops were followed by the setting up of 'Implementation groups' (composed of user representatives) with the task of describing scope, architecture and implementation plans for each service, including the necessary infrastructural requirements;

- experts were selected to join these groups and others were seconded to the GMES Bureau to assist the Commission in developing GMES;

- one important channel for consulting stakeholders is the GMES Advisory Council[4], which also gives access to a network of dedicated national coordinators. These coordinators have the specific role of mobilising their national user and developer communities, therefore representing a wide range of stakeholders.

- the European Commission's GMES Bureau has had regular bilateral meetings with stakeholders from industry, regions and other actors in order to gather the widest possible input from users and developers of GMES/GMES services and related infrastructure.

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[3] The GOSIS study in particular looked more specifically at the governance aspects of GMES rather than at the benefits linked to GMES as a whole.

[4] The GMES Advisory Council brings together EU/ESA Member States, the European Commission and ESA, as well as other stake-holders on an ad-hoc basis: relevant international organisations (e.g. EEA, EUMETSAT, European Maritime Safety Agency, EU Satellite Centre, etc.), representatives of end-users, industry, service providers, research organisations, academia.

- successive EU Presidencies have organised conferences dedicated to GMES/GMES[5], gathering stakeholders around specific aspects of the programme;

Annex II to this impact assessment is a synthesis of the results of this intensive consultation process. As an overall synthesis, it may be said that stakeholders believe that GMES is an initiative of key political importance and has created benefits both for service providers and users through significant R&D investment by the EU, ESA and their respective Member States.

R&D investments, however, are not a goal by themselves, but have been made with a view to preparing an operational provision of GMES services. The stakeholder consultation has clearly demonstrated that users, including the downstream service sector, require access to a continuous and sustainable flow of high-quality information produced by GMES service providers that cannot be ensured in the framework of research projects.

Stakeholders have thus confirmed the need to create a legal basis for an operational GMES programme in order to:

- consolidate the contributions of the various partners involved in GMES, taking into consideration the roles of the EU, ESA, EUMETSAT, their respective Member States and of other organisations as necessary, including international partners;

- ensure that, as a user-driven initiative, GMES is designed in such a way that there is continuous uptake of user requirements through on-going consultations with users communities and integration of their changing needs in an iterative process;

- implement financial and programmatic schemes to guarantee long-term sustainability of GMES, efficient management of Community funds and continuation of support to scientific and technical service evolution;

- facilitate market uptake by the value-adding service industry (including SMEs) by ensuring an open data policy that maximises the use and sharing of GMES data and information products (to the extent permitted by data owners) and contribute to the sustainability of the infrastructure that provides data for GMES.

3. WHAT IS THE CHALLENGE?

3.1. Problem definition

The extensive stakeholder consultation, which started with the 2005 Communication "From concept to reality", has indicated that the following major shortcomings are

[5] See the conference organised by the Austrian presidency in June 2006 “A Market for GMES in Europe and its regions - the Graz Dialogue”, Munich conference "The Way to the European Earth Observation System GMES - Munich Roadmap" organised by the German presidency in April 2007, the “Bridging the Gap: Responding to environmental change - from words to deeds” conference, hosted by the Slovenian presidency in Portoroz in May 2008, and the forthcoming GMES Forum organised by the French presidency in Lille in September 2008.

hindering the progress towards the realisation of the political and operational goals of GMES:

- despite the user-driven character of GMES and the set up of expert groups (known as service implementation groups), there is currently no formal process to involve the users in the definition of the scope and architecture of the services. This means that there is no formal assurance that users get what they need in terms of services and that the observation infrastructure is adequate to deliver the necessary data;

- equally, there is no process to consolidate the contributions of the various partners in the development of GMES, which could result in a duplication of efforts in Europe. In this context, it is to be recalled that Member States and intergovernmental organisations, in particular ESA, have been investing significant sums in earth monitoring activities. Nevertheless, a common approach is still missing among co-existing frameworks at EC, intergovernmental and national level that all have separate decision and financing mechanisms. To give best added-value to its contribution, the EU should be able to coordinate the contributions of other partners. There is also the need to involve regions and their networks in this process;

- GMES is currently a set of research projects financed by the EU, ESA and Member States budgets. These projects aim at developing services and infrastructure, but cannot ensure a continuous and sustainable flow of information in an operational environment. The consequence of this situation is that users are reluctant to invest in adapting their working methods to the emerging services as a guarantee on their continued availability is lacking. Equally, the lack of an overall long-term programmatic scheme is seen as high-risk by the adding-value downstream industry. Downstream market players are reluctant to invest as they cannot build business models based on short-term products available only within the framework of a consortia-led research project that are not subject to an operational service delivery mechanism and may impose restrictions on the commercial use of data.

This means that, for the moment, GMES simply amounts to a number of research projects, without an overarching legal and financial framework, and very limited operational funds. Without changes to this scenario, an operational capacity required to provide autonomous and strategic information on matters of environment and security cannot be realised.

3.2. How would the problem evolve, all things being equal?

The evolution of the problem, all things being equal, corresponds to the baseline scenario. The purpose of this subchapter is to describe the baseline scenario in terms of governance and financing aspects, taking into consideration existing financial and political commitments of the Commission. A more detailed description of political commitments of the Commission concerning GMES can be found in Annex IV.

3.2.1. Baseline scenario – governance aspects

Currently, the steering of the development of services and preparing the financing and governance for the longer term is under the responsibility of the GMES Bureau,

that was created - by Commission decision in 2006[6] - within the Directorate General for Enterprise and Industry, for a period of three years. The tasks of the GMES Bureau include:

- establishing the focal point for the co-ordination of GMES related activities of the Commission;
- identifying priorities related to GMES activities;
- consolidating and updating Commission needs and corresponding technical requirements;
- developing a data policy and mechanisms to ensure long-term access to data and sharing, taking into account and supporting the implementation of the Community rules concerning the infrastructure for spatial information in the Community;
- establishing relations with a broad range of providers and users leading to identification of an overall GMES management structure;
- developing partnerships based on international cooperation, including strengthening relations in the framework of the Global Earth Observation System of Systems;
- developing awareness and communication activities;
- developing the next phase going beyond Commission needs to include other European Union institutions and bodies.

Staff from other the Directorates-General of the Commission, in particular the JRC, the European Space Agency, the EEA and national experts have been assigned to work in or with the Bureau.

The Bureau receives guidance from a Steering Committee consisting of Commission services which are users of GMES services, and is assisted by the GMES Advisory Council. The primary mission of the GAC is to:

- provide strategic advice to the GMES Bureau concerning the long-term implementation of GMES services, creating favourable conditions enabling the development of services, stressing the user driven orientation of GMES, the need for interoperability, data harmonisation and avoidance of duplication of efforts;
- foster the co-ordination among, and the complementary role of European and national activities, thereby encouraging the creation of a "*GMES partnership*", as outlined in the GMES Communication;
- facilitate consensus-building in the relevant community(ies) around the development of a GMES capacity.

[6] See Decision C(2006) 673 of 8 March 2006.

The mandate of the GMES Bureau expires at the end of May 2009. The Commission has no obligation whatsoever to prolong this mandate. Although the Terms of Reference of the GAC do not contain a reference to its duration, the GAC would loose its main objective, namely to provide strategic advice to the GMES Bureau, in the event the Bureau ceased to exist.

From a governance perspective, the baseline scenario would thus correspond to a situation where the mandate of the GMES Bureau is not prolonged and no other dedicated structure is created in the Commission to replace it with a view to compiling user needs.

This means that regarding the EU budget the funds available for GMES under the space theme of the 7th Framework Programme (FP7) would simply be managed in line with standard FP 7 rules, without a specific management structure within the Commission services.

Activities of Member States and intergovernmental organisations, in particular ESA, in the field of earth monitoring would continue without a general governance framework.

3.2.2. Baseline scenario – financing aspects

Thus far, important investments have already been made in the EU and other intergovernmental entities. Within FP 6, the EU has spent 100M€ on GMES projects, whereas ESA invested another 100M€ in the GMES Service Elements projects. In FP 7, the EU will make available 550M€ for GMES service projects and procurement of data for these Services. Additionally, 650 M€ will be used to contribute to the development of the ESA Space component programme, which amounts to 1236 M€ for its first segment 1. ESA Member States will make a decision concerning the financing of the second segment of this programme in November 2008.

Despite these research investments, the Commission does not have a political or legal commitment to finance operational activities following up on research actions. According to the 2005 Communication "GMES – From concept to reality", GMES is to be developed in steps through the introduction of fast track and pilot phase services, starting with three fast track services (land, marine, emergency) by the end of 2008. These fast track services will be launched this year on the basis of research funds. This demonstrates that GMES could be continued simply as a research effort without violating political commitments of the Commission.

In addition to the funding of research projects through FP 7, the Commission is implementing a preparatory action (3 M€ in 2008[7]) to prepare proposals with a view to the adoption of future actions. Nevertheless the fact that a preparatory action exists, with a very limited scope (emergency services) does not imply a commitment for the Commission to make a proposal that covers all the areas mentioned in chapter 3.1. above.

[7] A budget of a comparable order of magnitude was requested for 2009. The Commission intends to request a further budget to continue the preparatory action in 2010.

From a financial perspective, the baseline scenario would thus mean that no operational funds are requested by the Commission in addition to existing FP 7 funds and the preparatory action, which cannot last longer than three years in accordance with Article 49 of the Financial Regulation.

3.2.3. Impact of the baseline scenario

This baseline would undermine users' and industrial confidence in GMES. The disappearance of any internal Commission structure to federate user needs, together with the discontinuation of operational funding in the absence of a legal base, would mean that the EU would not have the necessary decision making power for the future governance of GMES.

- On the users' side, the baseline would be read as a lack of commitment of the Commission towards GMES[8]. As a consequence, confidence in this initiative as a whole would be lost and users would not invest to modify their own structures in order to integrate the first available services. As no entity would exist in charge of federating user needs and taking them into account in shaping services, GMES would be seen as a technology-push project (but without political support), of little interest to users[9].

- On the service provider side, according to the stakeholder consultation, the main disappointment would come from the absence of perspective of EU financing outside research budgets. Service providers would probably still continue seeking research co-financing and therefore co-investing in GMES for a short time, but the absence of a flourishing Earth Observation downstream market coupled with the maturity of most GMES projects (already at the level of demonstration rather than pure research), would very likely preclude continued interest from industry.

- On the infrastructure side, the stakeholder consultation demonstrated that it would become extremely difficult to justify European investment in the absence of European-level user representation. The already approved co-financing of satellites through ESA would represent a sub-optimal investment if the data from those satellites could not be used for sustainable operational services but only for research purposes. As a result, the continuation of those observation capacities would be put at risk. In parallel, no downstream business would be created or expanded without the certainty that the necessary flow of data will be there without interruption;

- Regarding the activities of public authorities in the field of Earth monitoring (including regional, national and intergovernmental authorities), the baseline scenario would mean that the development and operation of infrastructure and the provision of services at regional, national and intergovernmental level could remain fragmented. Without a governance framework for GMES, which would provide for efficient coordination mechanisms a risk of infrastructure and service duplication exists

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8 As outlined in the Vega study entitled "The state of the health of the European and Canadian EO industry in 2006", the downstream sector is still dependent on public investments.

9 In its study entitled „Space 2030, Tackling society's challenges" the OECD confirmed the necessity to encourage private and public sector use of space data.

3.3. Does the EU have the right to act?

The Communication responds to a mandate defined in Paragraph 6 of the Resolution on the European Space Policy[10]. Further, the governance and financing schemes proposed in the Communication have been examined in the light of the subsidiarity principle. Past experience has clearly shown that the national/intergovernmental framework alone is inadequate to move GMES to an operational stage. Action at EU level will not replace but rather complement actions at Member States and intergovernmental levels (ESA, EUMETSAT, etc.) in order to achieve the common policy objectives. The overall structure will be designed so that GMES remains user-driven. The step-by-step approach followed until now in the GMES development will be further promoted. Therefore the approach proposed in the Communication is fully in line with the subsidiarity principle.

4. WHAT ARE THE OBJECTIVES OF THE COMMUNICATION

As GMES is a system of systems building on existing capacities at regional, national and intergovernmental level, the EU needs to formalise and consolidate its involvement in terms of decision making and financing and ensure that its own interest as a principal user of GMES services is preserved. To this aim, it will be necessary to formalise the contributions of all GMES partners in the same way and establish the programme as a contribution to a partnership of different actors in which the EU plays an important role.

Moreover, in order for the envisaged benefits to materialise, it is necessary to establish a framework for a programme definition and implementation, with particular focus on the involvement of users and the appropriate management of EU financial resources, in addition with resources contributed by other partners and mobilised for the common objectives.

Consequently, the EU has to fulfil a double role:

- the overall **partnership coordination** including contributions financed by other partners at national, regional, local and intergovernmental levels.
- the **implementation of the Community contribution** in this partnership.

4.1. Objectives

The main objective of the 2008 Communication is therefore to

- address the fundamental problems, namely lack of governance structures, sustainable funding and user representation; and
- indicate the willingness of the Commission to propose a Basic Act establishing the EU GMES programme, which, however, does not prejudge future financial decisions.

[10] OJ C136/2 of 20.6.2007.

The specific objectives of the Communication are to:

(5) define a transparent and sustainable governance framework that contains a clear division of the roles of the ***partners*** in the GMES partnership, based on the principle that GMES should use to the largest extend possible existing capacities;

(6) guarantee user uptake, in particular through constant involvement of users so that GMES remains ***user driven***

(7) ***reassure stakeholders*** about the EU commitment to GMES in the sensitive phase of demonstration which precedes the move to operation;

(8) outline how the governance and financing framework can be ***implemented within a reasonable timeframe***.

While the Communication will only identify broad principles and orientations, the detailed elements (scoping of the services, development and management of the observation infrastructure, share and proportion of the EU funding in the various GMES components) will be defined at a later stage in the proposal of a legal act. As stated above, these measures, which will be presented as a follow-up the Communication, will be accompanied by their own impact assessment. Consequently, the Communication does in no way prejudge future financial decisions and therefore does not have a financial impact on the EU budget.

4.2. Consistency with other EU policies

4.2.1. General considerations

GMES is a tool in support of existing EU policies as well as their implementation by Member States. Its Earth Observation-based services are meant to inform and support policy decisions that are knowledge-based, proportionate and effective, while respecting the principle of subsidiarity. Among these policies, there are areas of strategic importance such as climate change, security and the European Space Policy. GMES will similarly enable a better assessment and evaluation of the effectiveness of EU policies, e.g. with regard to air pollution or water quality. For Member States, GMES will make it easier to fulfil their monitoring and reporting obligations imposed by European legislation e.g. in the field of environment. Finally, GMES should also be a tool for cooperation actions linked to development, humanitarian aid and emergency situations worldwide, and more specifically with Africa[11].

GMES will be expected to have a significant impact on the streamlining of such reporting requirements through consistent data and information approaches from European to national and regional levels. Additionally, the Commission will ensure complementarity and consistency with other Community policies, in particular in relation to competition, the European GNSS programmes (see chapter 4.2.2), the

[11] In Africa, presently the Lisbon GMES Process is being implemented in collaboration with the African Union Commission and the African RECs. This will lead to a pan-African Earth Observation programme in the framework of the EU-Africa Partnership on S&T, Information Society and Space Technologies..

protection of personal data, the establishment of an infrastructure for spatial information in the European Community (INSPIRE), and the cohesion policy[12].

In the environmental sphere, the Communication announcing a Shared Environmental Information System (SEIS) adopted in February 2008 sets out the Commission's view on the approach needed to modernise and simplify the collection, exchange and use of the data and information required for the design and implementation of environmental policy. SEIS is based on a number of principles that the Commission sees as necessary in order to take full advantage of modern technology to provide the information base needed to address environmental challenges. In this context, GMES—now GMES—is seen as a basis for improving the provision of services both to public policy makers and to citizens.

Moreover, GMES services produce information for monitoring and understanding climate change and may contribute towards improvements in the transport sector and the deeper marine knowledge needed for implementation of the EU's new Integrated Maritime Policy[13].

It should also be mentioned that GMES is fully in line with the regional policy of the EU. Within the Regions For Economic Change initiative funded under the INTERREG IVC and URBACT II programmes, transnational networks of voluntary regions can work together to capitalise on the wealth of knowledge, experience and good practice available in other regions. This initiative works on the basis that ideas, tools and approaches are developed, experiences exchanged, and these then can be implemented through the mainstream Operational Programmes. 'Improving monitoring of environment and security by and for the regions' is one of the themes recommended by the Commission. Finally, the development of an Urban Atlas included in the Land Monitoring Core Service is financed through the budget for regional development.

Finally, the GMES services are considered essential not only because their more direct users are policy makers, but also in order to stimulate innovation and growth in the downstream sector. The Earth Observation-based services sector is, in fact, expected to develop much faster owing to GMES, mostly to the benefit of SME's. While the GMES downstream sector competitiveness study has shown how this sector is today relatively small and in an immature stage, the availability of GMES services has the potential to accompany the sector towards maturity while creating innovation spin-offs in other sectors, but also to integrate GMES information in major industrial sectors such as energy, agriculture, water resources management, transports, etc. In these aspects, GMES fully supports the Lisbon objectives.

4.2.2. Consistency with the European GNSS programmes (EGNOS and Galileo)

Galileo and GMES are both flagship programmes of the European Space Policy. It is therefore of paramount importance to avoid inconsistencies between Galileo and GMES, to use synergies to the maximum extent possible, and to take into

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12 The Community Strategic guidelines on Cohesion 2007 and 2013 underline the need to strengthen the links between environmental protection and growth and make specific reference to GMES in section 1.1.2.

13 An Integrated Maritime Policy for the European Union ("The Blue Book"), Brussels, 10.10.2007, COM(2007) 575 final

consideration lessons learned from Galileo and the European Geostationary Navigation Overlay Service (EGNOS), a predecessor of Galileo. For this reasons, staff members of DG TREN and DG ENTR are in regular contacts at working level. Further, the governance and financing of Galileo has been assessed in detail in the context of the assessment of the options analysed in chapter 6 below. Nevertheless it should be recalled that major differences exist between Galileo and GMES:

- technically speaking, GMES and Galileo cover two different fields: GMES is essentially an Earth observation programme, whereas Galileo is a satellite navigation programme;

- the architecture of GMES infrastructure, a system of systems, is much more complex than the architecture of Galileo and EGNOS;

- the five Galileo services will mainly depend on input from Galileo space infrastructure, whereas GMES services will use input from multiple sources, including space infrastructure co-financed by the EC and contributing space missions, and a large variety of in situ infrastructure.

Further, it should be recalled that the management structures established for the Galileo development phase (in particular the Galileo Joint Undertaking created under Article 171 of the EC Treaty) are of limited relevance for the purpose of the Communication, which mainly covers the legal, institutional and financial framework for operational activities. A Joint Undertaking is body established for research and development purposes according to the EC Treaty. Therefore they could not be used to manage operational GMES activities[14].

The Community agency that assists in the management of deployment and operational phases of the European GNSS programmes, the GNSS Supervisory Authority (GSA), is also currently not entirely relevant for GMES because of the moratorium concerning the establishment of new regulatory agencies (see Scenarios 2 and 4 below).

5. POLICY OPTIONS

For the sake of clarity, policy options will be outlined separately for the two key issues covered by the Communication: sustainability of funding and governance scheme. These options are based on the assumption that GMES services will be made available fully and openly, unless this would endanger EU security interests. This will help to promote the widest possible use and sharing of Earth observation data and information according to the principles of the European Shared Environmental Information System (SEIS)[15] and Global Earth Observation System of Systems (GEOSS) initiatives. Additionally, public investment will encourage industry to explore innovative ways of integrating observing, communications and

[14] For the sake of completeness it should be mentioned that the co-operation with ESA relating to the development of space infrastructure for GMES (the Sentinel missions) is based on a delegation agreement under Article 53d of the Financial Regulation, whereas the other funds available under FP 7 for GMES are managed under standard grant mechanisms, in line with normal FP 7 procedures.

[15] Towards a Shared Environmental Information System (SEIS) (COM(2008) 46 final)

information technologies and should facilitate market uptake by value-adding service providers, notably Small and Medium Enterprises (SME).

5.1. Options on Sustainable financing

Concerning the **sustainability of financing (S)** of service provision and contribution to infrastructure development and operations beyond research, policy options at hand are:

- No action, S0-option: the 2008 preparatory action has no follow-up. The EU continues to limit its financial contribution to GMES to research funds, without proposing a legal base for the continuation of the operational activities launched through the preparatory actions.

- Option S1: same as the previous option until 2013, but a programme is proposed in the context of the preparation of the next financial framework. A gap is left between the preparatory action (2008-2010) and 2014.

- Option S2: a Community programme is proposed in due time to bridge the gap between 2011 and 2014, giving continuity to the preparatory actions and defining the role of the actors in the implementation of the GMES programme.

The exact scope and the underlying rationale of the activities covered either by a programme starting in 2014 (see option S1) or in 2011 (see option S 2) will be analysed in the Impact Assessment accompanying the corresponding Basic Acts. In this context, it is recalled that GMES is a system of systems that can be implemented in a modular way, depending on the available EU resources, which will determine the EU contribution to each component (Space, In situ, services). Unlike Galileo, which aims at deploying a constellation with a predetermined number of satellites and (corresponding ground segment facilities), GMES will be subject to a phased implementation approach. For instance, the current agreed priorities include the development of land monitoring, emergency response, marine and atmosphere services and corresponding infrastructure.

5.2. Options on Governance schemes

Concerning the roles and responsibilities of different actors **(governance scheme-G),** policy options at hand are:

- No action G0 option: The mandate of the GMES Bureau is not prolonged in 2009 and no other dedicated internal management is created. Further, no specific governance structure is established in addition to applicable rules for research funds.

- Option G1: The Commission takes strong political and managerial control and is in charge of the management of the GMES programme, a formal process for the compilation of user requirements and of the coordination of the contributions of various GMES partners which continue to act according to their mandate and own governance scheme. Within the Commission, a dedicated internal management structure is responsible for coordinating GMES, whose mandate should be defined, based on the outcome of the evaluation of the GMES Bureau, which will

be available at the end of 2008. Technical implementation tasks could be delegated to other entities.

- Option G2: The Commission could propose to create a new external entity (e.g. a Community agency, or to extend the mandate of an existing Community entity) to manage the programme on its behalf.

- Option G3: A single governance body managing all GMES elements and representing all stakeholders is established.

- Option G4. The responsibility for overall programme management is delegated to the ESA.

5.3. The discarded options

An analysis in the light of the objectives presented in chapter 4.1. demonstrates that some options (or combination of options) are clearly not viable and will therefore not be discussed in further detail in chapter 6 below.

In particular, combining the G0 option with options S1 and 2 is inconsistent because the first specific objective of the Communication, namely to propose a stable and transparent governance framework, would not be met. In fact, any combination involving the G0 option would pose substantial management problems, as the preparation and management of a new programme either before or in the context of the preparation of the next financial framework cannot be implemented without a responsible body, with appropriate mandate and staff. Although it would be possible, in theory, to manage Community funds simply on the basis of the Financial Regulation, this approach would not correspond to the specific characteristics of GMES, a complex system of systems involving many partners. Combinations involving G0, which are close to the baseline scenario described in chapter 3.2, are therefore discarded.

Similarly, all combinations involving the Option S0 are inconsistent. Generally speaking, the impacts of the different governance options are strictly related to the sustainability scenarios: in the absence of a programmatic approach beyond research no governance option would be beneficial. It is obvious that the third objective of the Communication, namely to reassure stakeholders, would not be met if the Community continued to finance GMES on the basis of research projects only. The stakeholder consultation has clearly shown that a research environment alone cannot provide the stability and confidence necessary to allow for significant investments in the downstream sector. Additionally, it would be inefficient to create specific management structures if no budgets other than research ones are available for GMES, given that the structures for the management of FP funds are in place anyway. Combinations involving option S0 are to a certain extent a variation of the baseline and are thus discarded.

Even though at first sight option G3 could make the programme easier to manage, it has also been discarded since:

- GMES is a system of systems, it would therefore not be feasible for political and legal reasons to centralise decision-making power that would also concern activities financed through national budgets in a single entity.

- Option G3 could probably only be implemented through the establishment of a new intergovernmental organisation, which would be extremely burdensome (needing the creation of a large management and technical team) and difficult to accept for existing actors.

- Option G3 would not be built on existing structures and would run the risk to duplicate what is already exiting and be in direct competition.

- This option is also the most difficult to reconcile with the mandate given by the Council to build GMES on existing capacities.

As a consequence, all combinations of options containing G3 are not taken into account in the impact assessment.

Finally, all combinations involving option G4 have been discarded for two main reasons. First, the governance framework must respect the role of the Commission as defined in the EC Treaty and the jurisprudence of the European Court of Justice concerning the institutional balance within the EC[16]. Consequently, it is not possible that the Commission delegates the political responsibility for coordinating and managing the GMES programme to an external entity, such as ESA.

Additionally, the implementation of GMES goes beyond the technical capacity and mandate of ESA. In particular, although ESA is assigned a key coordination role for the space component, for political, practical and legal reasons, it cannot be delegated the management of the in situ and service components.

5.4. The baseline and combined options

The baseline scenario described above would correspond to a combination of the no change S0-G0 options. It serves as the benchmark for the impacts of the other scenarios.

The combination of options on Sustainable funding and Governance can be summarised as follows and leads to the further analysis of four scenarios, the impacts of which have to be assessed with respect to the objectives of the Communication as defined above, and in comparison to the baseline.

	G0	G1	G2	G3	G4
S0	**Base line**	Discarded	Discarded	Discarded	Discarded
S1	Discarded	Scenario 1	Scenario 2	Discarded	Discarded
S2	Discarded	Scenario 3	Scenario 4	Discarded	Discarded

[16] See, in particular, the Judgment of the Court of 13 June 1958. - Meroni & Co., Industrie Metallurgiche, SpA v High Authority of the European Coal and Steel Community. - Case 9-56.

6. ANALYSIS OF IMPACTS OF SCENARIOS

As outlined in Chapter 1 the object of this Impact Assessment is not the socioeconomic and environmental impact of GMES itself, which will be analysed in detail in the Impact Assessment concerning the Basic Act establishing the GMES programme. Conversely, the present document assesses the impact of options for the establishment of efficient governance and funding framework for GMES. The following chapter therefore concentrates on an assessment of the impact of these options in the light of the objectives defined in chapter 4.1.

6.1. Baseline Scenario

The impact of the baseline scenario is analysed above in chapter 3.2.

6.2. Scenario 1

Scenario 1 consists of a combination of Options S1 and G1. In this scenario, a GMES programme coordinated by a dedicated internal management structure would be launched in 2014. A strong role of the Commission in the management of GMES, as foreseen in option G1, would fulfil the first objective stated above, as the programme would be managed in a stable governance framework. The Stakeholder Consultation described in more detail in Annex II to this Impact Assessment demonstrated the importance of a robust programme management, particularly to ensure integration between existing GMES components, coherent management of key programme elements, and full involvement of all players. The ultimate responsibility for programme management will therefore be with the Commission, as in the case of the European GNSS programmes. Experience with these programmes has shown that an outsourcing of programme management tasks (either to a Community agency or an external entity outside the EU framework, such as ESA) may limit the capacity of the Commission to take effective political responsibility of the programme[17]. Nevertheless, it is in line with the principle of sound financial management to delegate technical implementation tasks to ESA, which will be responsible for the coordination of the GMES space component, including the development of new satellites, the procurement of recurrent satellites, the operation of space infrastructure and the coordination of access to data from contributing missions.

The management of the GMES programme should be the task of a specific internal management structure. Options for such internal management structure include the establishment of a normal Commission unit within a Directorate that takes over the tasks of the GMES Bureau, without a decision of the Commission, or a prolongation of the mandate of the GMES Bureau. The decision on the way the tasks currently under the responsibility of the GMES Bureau will be covered after May 2009 depends on the outcome of an independent evaluation of the GMES Bureau. The final report of the evaluation will be available at the end of 2008 and is in no way prejudged by the present Communication and Impact Assessment. The contract with the external evaluator does not provide for Interim Reports.

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[17] In this context, see also page 11 of the Communication from the Commission to the European Parliament and the Council - Progressing Galileo: Re-Profiling the European GNSS Programmes of 19.9.2007, COM(2007) 534 final.

Regarding stakeholder involvement, the Commission could be assisted (i) by the GMES Partners Board, for the co-ordination of contributions of GMES partners (i.e. in particular the Member States owning or controlling infrastructure that will be made available to GMES), and (ii) a comitology committee. It is obvious that the comitology committee cannot be set up before the adoption of the Basic Act establishing the GMES programme. The establishment of two separate bodies (GMES Partners Board and a comitology committee) is necessary for legal and institutional reasons. The comitology commitee will assist in the management of EU funds, whereas the GMES Partners Board will coordinate activities that are financed not only by EU funds, but also through national or intergovernmental funds. The creation of one single body both for the management of EU funds in line with the comitology procedure, and the coordination of other activities funded through non-EU sources that are managed according to national or intergovernmental governance schemes could lead to important institutional difficulties.

Further, it is likely that under Scenario 1 a dedicated internal Commission structure would delegate the technical implementation of the programme to other entities. Within the infrastructure component,

- ESA could coordinate the implementation of space infrastructure;
- the European Environment Agency (EEA) could coordinate the in situ component.[18]

Within the service component, in particular the following entities could play a role:

- the European Centre for Medium-range Weather Forecasting (ECMWF)[19];
- Joint Research Centre (JRC);
- Eurostat;
- the European Environment Agency (EEA);
- the European Maritime Safety Agency (EMSA)[20];
- the European Union Satellite Centre (EUSC);
- the European Defence Agency (EDA);

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18 Some specific coordination activities could be delegated to other existing relevant coordination bodies For instance, EUMETNET (the European network of meteorological services) for meteorological in-situ observation systems and services; EUROGOOS (the European Association for the Global Observing System); EUROGEOGRAPHICS (the European association of National Mapping and Cadastral Agencies) and Eurogeosurveys (the European Association of Geological Surveys) for cartography, geology, mapping and reference data; and EMODNET (the European Marine Observation and Data Network) for marine data. The EEA should take into consideration research activities of the Commission services (including DG INFSO) in the in situ field.

19 The ECMWF could be assigned the coordination of the Atmosphere network, in consultation with the EEA, which could compile user requirements.

20 Both EDA and EMSA do not have a competence in security matters, which will be managed by FRONTEX, EUSC and EDA.

- European Agency for the Management of Operational Cooperation at the External Borders (FRONTEX).

Regarding user involvement, a risk exists that a delay in the implementation of long-term governance mechanisms could jeopardize user acceptance before 2014. This is because the current ad hoc mechanisms for compiling user requirements, based on standard rules concerning public consultations organised by the Commission, might not be sufficient to guarantee a structured involvement of users in the establishment of their requirements. In this context, it is to be recalled that the ultimate decision concerning user requirements will be with the Commission, which will manage the programme on behalf of the Community. A direct involvement of users other than Member States in the adoption of formal decisions is difficult to implement in the current legal environment.

The impacts of option S1 on users and providers of GMES services are more difficult to estimate. While operational financing would in the end be present, a gap is left in a phase when demonstration would be practically at its end. It is possible that both industry and users could adapt to a further stretch of the demonstration phase (with the positive signals sent by preparatory actions) and accept to wait until 2014 before seeing operational financing from the EU. However, there would be a significant risk of losing support from both sides if confidence is eroded in this timeframe, for several reasons. First, the Vega study referred to in footnote 5 clearly indicates that the Earth observation market in Europe is still dependent to a relatively large extent on national, ESA or EC contracts. This means that a lack of EU funding would have a negative impact on GMES service providers. Secondly, a delay in the introduction of operational services would mean that downstream services would not have access to information produced by GMES service providers, which could hamper the development of this sector. Thirdly, a delayed provision of GMES services would result in a lower demand for data from space and in situ infrastructure. This could have a negative impact on the sustainability of these infrastructures, which are of key importance for the development of the sector according to the OECD. Moreover, one would have to consider a risk of losing any first-mover advantage internationally through this delay, as emerging and established space nations have shown signs of following European plans on their own agenda to compete with Europe. Consequently, it cannot be excluded that S1 meets the objective of reassuring stakeholders only in part.

Finally, it must be asked whether S1 would allow for a timely implementation of the governance and funding framework of GMES. As mentioned above, there is a risk that even though this Scenario would provide for a stable governance framework, the launch of the GMES programme in 2014 could result in a discontinuity of some services. Consequently, users that have integrated GMES services provided through research projects in their management procedures would face a gap in the information input necessary to fulfil their specific needs. This means that users might not be willing any more to use GMES services available operationally only after 2013.

6.3. Scenario 2

Scenario 2 corresponds to a combination of the options S1 and G2 where a programme prepared in the context of the next financial framework would be

managed by an external entity. The main difference between Scenario 1 and 2 lies in the way the Commission organises overall programme management and coordination of the GMES partnerships. In Scenario 2, management tasks would be outsourced to an external Community body, which could be an executive agency or a regulatory agency. Regarding the establishment of an executive agency, it would have to be assessed whether the extra costs incurred to create a new body would be justified by efficiency gains. Currently, it is assumed that an externalisation of management function would not be cost-efficient because it could lead to a duplication of existing capacities (in particular the GMES Bureau).

Alternatively, the Commission could propose the establishment of a new regulatory agency or extending the mandate of an already existing one. Nevertheless the current Commission position is not to propose the creation of new agencies pending the results of the evaluation of existing agencies[21].

Stakeholder involvement would be organised in a way comparable to Scenario 1, i.e. through a GMES Partners Board and a comitology committee. Depending on the set up of the external Community body, there could be additional ways of involving Member States, including an Administrative Board in the event a regulatory agency were to be created.

In theory, Scenario 2 would therefore meet the first objective referred to in chapter 4.1. It is assumed, however, that this Scenario is not cost-efficient, or would be in contradiction with the current community position concerning regulatory agencies.

6.4. Scenario 3

Scenario 3 consists of a combination of options G1 and S2. In this scenario, the Commission would directly manage a GMES programme that would already be launched before 2013. The fact that the Commission takes strong political and managerial control would ensure a stable and transparent governance mechanism. Furthermore this corresponds to the views of stakeholders which expect the Commission to take the lead for the definition, by the EU, of the overall vision for GMES and the extent of the use of its available instruments such as coordination, financing and regulatory measures for the governance of the different components of GMES.

As in the subchapter concerning Scenario 1, the internal management of the Commission could be based on the GMES Bureau or another specific internal management structure. Before the adoption of the Basic Act establishing the programme, an interim governance structure would be put in place (see 6.2. above).

Scenario 3 would also allow the Commission to formalise the process leading to the establishment of user requirements already in the short to medium run. This is one of the main expectations expressed by the user communities during the consultation process. The close involvement of users within a stable mechanism would encourage public sector use, which is of key importance according to the OECD study referred to in chapter 4 of Annex 3. Further, private users, including downstream service

[21] See the Communication from the Commission to the European Parliament and the Council, "European agencies – the way forward", COM(2008) 135 final of 11.3.2008.

providers, will have the possibility to contribute to the compilation of user requirements, thereby ensuring that the information produced by GMES services will correspond to their needs.

Stakeholders contributing in situ or space infrastructure would be part of the GMES Partners Board; Member States would be represented in a comitology committee.

Scenario 3 would have maximum benefits in terms of stabilising the industrial base and also in terms of involving users, as a smooth and seamless transition from research to operation would be guaranteed. This would also trigger maximum benefits as compared to other options in terms of stimulating the Earth observation downstream sector in a short timeframe, helping to sustain the impressive growth of Earth observation markets in Europe[22] and encouraging private sector participation, as recommended by the OECD. This means that Scenario 3 would fully meet the third objective referred to in chapter 4.1. above.

Regarding the fourth objective, the major advantage of this scenario is the timing of entry into operation of GMES services, which would allow the EU to reap maximum benefits from the environmental information coming from GMES (and where the establishment of trends requires the provision of long, uninterrupted time series), and other users who intend to continue using operational GMES services previously provided on a pre-operational basis by research consortia.

6.5. Scenario 4

Scenario 4 is a combination of options G2 and S2. In this scenario, the Commission would externalise the management of a programme launched already before 2013. For the reasons already mentioned in the sub-chapter covering Scenario 2, this Scenario does not seem to meet the first objective referred to in chapter 4.1 1 in the most efficient way:

- An externalisation of management function would not be cost-efficient because it could lead to a duplication of existing capacities (in particular the GMES Bureau);
- It would be premature to propose the creation of an external entity that could contradict community orientations concerning regulatory agencies.

7. COMPARING THE SCENARIOS

In the table below, the scenarios assessed in chapter 6 (with the exception of the discarded ones as explained above) are compared to the baseline examined in chapter 3.2. above in the light of the objectives of the Communication.

Comparison is based on qualitative analysis, which is proportionate to the form and content of the Commission Communication (not legally binding) and to the issue at stake (not GMES as a whole, but its implementation mechanisms).

[22] According to the Vega study, European earth observation markets have grown 7 – 8% per annum in the last years.

More detailed cost-benefit analyses will be performed if necessary when the Commission will propose a Basic Act establishing a GMES programme, including the relevant budget appropriations.

	Objectives			
	Transparent and sustainable governance framework	Users buy-in	Stabilisation of industrial base (upstream and downstream)	Feasibility in needed timeframe
Scenario 1	+	+	-	+
Scenario 2	+	+	-	--
Scenario 3	++	++	++	+
Scenario 4	+	++	++	--

The timely submission of a proposal for a Community programme to ensure continuity after the preparatory actions, as foreseen in Scenario 3, seems to best fit the Communication objectives and best respond to stakeholders' concerns expressed so far. Its combination with an internal Commission management structure would minimise implementation obstacles.

In Scenario 3, Commission would opt for adopting the necessary proposals in 2009 and work as closely as possible with the legislator in order to have a final adoption by 2011. This would represent an important signal to stakeholders, to industry and users in particular, that would ease transition to the operational phase and avoid loss of confidence.

Alternatively, postponing the programme to the next financial framework (while also avoiding creation of new external entities) would represent the easiest option to implement (see Scenario 1). However, as explained above, the gap between 2010 and 2014 represents an important risk of losing stakeholders' confidence that should be carefully managed.

8. MONITORING AND EVALUATION

The Communication itself will not directly result in the financing of new activities through the EU budget, in addition to the actions financed through FP 7 and the preparatory action. The latter activities are not the object of this impact assessment, they will be monitored and evaluated according to standard Commission procedures.

The Communication, however, contains a list of actions that will be carried out by the Commission itself. For the implementation of theses actions, the Commission will also consult the GMES Advisory Council, or its successor in an interim governance framework. An evaluation of the relevance, efficiency and effectiveness of the European Commission's GMES Bureau activities was started in July 2008 and the final report is expected for January 2009, in time to feed any further proposals implementing this communication.

The preparation of the Basic Act establishing the GMES Services will be carried out by the Commission itself in line with applicable rules. In particular, an Impact Assessment will be prepared, which will contain an evaluation of the costs of the activities to be implemented either starting from 2010/2011 or 2014, depending on the option chosen.

The Basic Act establishing the GMES programme will contain detailed provision on the monitoring and evaluation of activities financed through the EU budget.

ANNEX I

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ANNEX II

RESULTS OF THE STAKEHOLDER CONSULTATION

Introduction

In 2004[23] the Commission underlined the strategic role of GMES, identified elements for its implementation and the next year defined the strategy to move from concept to reality notably through a phased implementation approach[24]. The Space Council supported this approach and at the same time stressed the need for a consolidation of the overall GMES architecture, and the identification of appropriate governance and financing schemes.

In 2006, the Commission set up the GMES Bureau to strengthen the management of GMES. The Bureau is tasked to prepare, in close coordination with the relevant stakeholders and users, the Commission proposals and requirements on GMES.

The following chapters provide a synthesis of the input received by the Commission in the last two years from expert groups, stakeholders and Member States, and highlight the consensus achieved on the main issues where it is necessary to act to ensure an operational implementation of GMES.

Towards an Operational EU GMES Programme

So far, GMES has been a European initiative that has drawn political attention to the need to preserve and strengthen service and infrastructure elements. Substantial R&D effort has been invested by the EU, ESA and their respective Member States. In the future, it is considered that GMES should be the product of a series of partnerships that need to be defined at the EU level, taking into consideration the role of agencies, Member States, value added services industry (including SME's) and user communities.

The variety of partnerships, infrastructure and services involved in GMES is linked with the areas of interest of the different partners, notably Member States. Consequently, in the operational phase of GMES, this should be reflected in the programmatic, management and financing schemes.

As a user-driven initiative, GMES should be designed in such a way that there is continuous user uptake through constant consultation with users and integration of their changing needs in an iterative process.

Financial and programmatic schemes should be designed to guarantee long-term sustainability of GMES and the efficient management of Community funds, and to support scientific and technical service evolution.

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[23] Global Monitoring for Environment and Security (GMES): Establishing a GMES capacity by 2008 – Action Plan 2004-2008 (COM (2004) 65 Final).

[24] Global Monitoring for Environment and Security (GMES): from concept to reality (COM (2005) 565 Final).

8.1. Definition of the EU GMES Programme

Following various Council Orientations and Resolutions, the EU has been assigned a leading role in the development of GMES, with ESA being the implementing agency for its space observation component. The roles of all actors need to be consolidated. It is imperative that the EU defines the overall vision for GMES and uses its available instruments such as coordination, financing and regulatory measures for the governance of the different components of GMES. Those financial and programmatic instruments should guarantee a long-term sustainability of services and infrastructure.

Building on existing operational activities, previous and current R&D activities and the Preparatory Action, the GMES programme should contain a definition of its overall objectives and the areas where EU action is required, and indicative budgetary resources. It should have a clear scoping complementing the actions at national and intergovernmental levels and ensuring the user driven character of GMES.

The GMES architecture consists of several individual components. Each of these components has its own characteristics in terms of ownership, facilities, decision-making process, financing model, industrial and economic set-up and management. Where lacking, dedicated governance mechanisms should be implemented for each of these GMES components taking into account existing and future technical and institutional specific characteristics and structures.

The overall governance scheme will aim at establishing a sustainable institutional and financial framework for GMES and integrating GMES actors with a view to establishing genuine partnerships. It should allow for the interaction of the individual GMES components and their associated sub-governance schemes, and should ensure the efficient management of Community funds allocated to the programme, the management of necessary contractual relations for the operation of GMES, and legal representation towards external actors and international communities and coordination bodies, including the Group on Earth Observations (GEO).

Within the overall governance of the programme, mechanisms able to bring together actors of different institutional nature should be defined, ensuring a proper representation of the EU Member States. The specific issue of countries who are not members of the EU and who are involved in the implementation of GMES has to be addressed in this context.

Key issues raised by Stakeholders

- Ensuring that the EU and its Member States have the level of engagement and incentive to commit to the long-term availability of institutional observation and service infrastructure and resources for GMES.
- The EU GMES Programme should be defined in such a way that it adequately complements existing financing and programmatic schemes, thereby becoming a decisive factor for the establishment of a partnership between the EU and national and intergovernmental actors.

- Decision-making should be streamlined with clear roles and responsibilities involving all different actors, and especially funding bodies, and putting users at the forefront. The role of mandated bodies in this process is particularly important. The process at the operational phase should be transparent and binding on reaching consensus and on implementing decisions including the evolution of GMES.

- To ensure transition to a governance system for an operational GMES architecture, robust programme management is needed, particularly to ensure integration between existing GMES components, coherent management of key programme elements, and full involvement of all players.

- User communities should be involved in governance and management at overarching and component level, so as to promote a continuing dialogue between the entities defining user requirements, observation and service infrastructure and service operators, and the bodies deciding on the future evolution and funding of GMES.

8.2. Funding

GMES is essentially a shared and distributed system and therefore it is expected to be co-financed at European, intergovernmental and national levels.

The costs of GMES during its operational phase depend on the scope of the services, the consolidated cost of the observation infrastructure needed to provide these services, and the extension of the international cooperation.

The share of the EU budget in the overall amount will depend on the scope for the activities funded and managed at EU level. According to the additionality principle, the EU contribution will not replace existing and planned national investments but will rather complement them in order to ensure a long-term sustainability for GMES. There is a need for continuity of EU R&D budgets as well as for the establishment of new budgets at EU level to support the operations of GMES.

Key issues raised by Stakeholders

- Preparing an operational funding line in the European Union budget by 2014 while ensuring the phased operational implementation of GMES in line with Space Council orientations at the same timeframe.

- Taking the necessary steps to expand the preparatory operational budget line introduced in 2008 in order to cover expenses required for the finalisation of the build-up and early operation of GMES services and the GMES observation component.

- The long-term GMES funding approach should ensure a smooth transition between three stages that partly overlap: demonstration stage to be funded from R&D appropriations, pre-operational stage with mixed R&D and operational funding, operational stage with operational funding from EU and national operational budgets, bearing in mind that demonstration activities and future operational elements will continue to require R&D funding during the operational stage.

8.3. The Downstream Sector

GMES has been selected as one of the quick start projects in the Commission's Initiative for Growth[25]. It should stimulate the industrial sector to expand its service offer and to develop the innovative integration of observing, communications and information technologies that will create opportunities for increased private sector usage of information sources. The European industrial base will be an important asset in maintaining a European autonomous capacity and political independence in decision making.

The stimulation of the downstream sector should also be facilitated by the mobilisation of traditional EU instruments in support of competitiveness and innovation. Full, equal and open access to GMES data and information will contribute to the Lisbon growth and job strategy and preserve the competitive market in the value adding sector.

Key issues raised by Stakeholders

- The GMES data and information policy should be based on the principle of "full and open access" to the extent allowed by the overall financial model and other legal and security-related constraints.
- Structured user support measures, with special focus on capacity building for shared needs among different Member States and for different application sectors.
- Structured business support measures with special focus on small and medium enterprises should stimulate growth and job creation.
- In order to support the continued development of innovative services, primarily in the downstream sector, R&D funds must continue to be made available.

8.4. International Cooperation

Although European autonomy for GMES services is of key importance, the EU recognises that international cooperation in Earth Observation is imperative to fulfill the need for information based on global in-situ and remote sensing data. This cannot be pursued without exchanging equivalent observation data through cooperation schemes, thereby sharing the burden and cost of an expensive observation infrastructure with major non-European partners.

Further, only a coordinated approach bringing together the main actors in the world can lead to efficient counteraction facing global threats. The joint development of shared or complementary Earth observation tools has led the major actors in the world to recognise the reality and criticality of the on-going climate change process.

International cooperation should, when appropriate and efficient, build on existing cooperation schemes developed by European national and intergovernmental actors with international counterparts.

[25] "A European initiative for growth: Investing in networks and knowledge for growth and jobs: Final report to the European Council" COM(2003) 690 final/2 (21.11.2003)

Among those is the GEO process. GMES will be the main European contribution to the global 10-year implementation plan for the Global Earth Observation System of Systems (GEOSS). By registering GMES components in the GEOSS, GMES will contribute to increasing the knowledge of the Earth processes, enhance the prediction of the Earth systems, and will encourage the increased use of Earth observation, the development of a system of worldwide observation systems, and collaborative tools for observation and analysis with international partners.

Key issues raised by Stakeholders

The strategy regarding possibilities of international cooperation linked to GMES should be built along the following lines:

- Balanced cooperation on observation infrastructure that does not compromise the GMES objective for European autonomy in information generation, access and control and technological capacity in key areas;
- R&D cooperation to prepare the future and foster interoperability;
- Cooperation, in line with EU external relations policies, especially for contributing to sustainable development, as well as for European solidarity and capacity building approach including for instance support to food security, humanitarian aid, management of emergencies and crises.
- Strengthening the existing political mandate to support a co-ordinated European approach within the current development of the GEO process to implement the GEOSS data sharing principles and to define the European contribution to this international endeavour.

Implementing GMES: consolidated views and open issues per component

Following the wide consultation notably through the GMES Advisory Council and in accordance with the *Munich Roadmap*, there is now a shared vision on the scope, architecture, and governance principles for GMES. The following sections summarise, starting from the existing stakeholders' consensus where available, the main issues raised by Stakeholders and linked to the different components of the GMES architecture.

8.5. The GMES Service Component

Through its service component, GMES will ensure regular observation and monitoring of the sub-systems of the Earth– including its atmosphere, oceans and continental surfaces – and will provide reliable, validated information in support of a broad range of environmental and security applications and decisions. According the current analysis of the user needs, the scoping of these services is as follows:

- *Land monitoring*

The Land Monitoring Core Service (LMCS) addresses a wide range of resources and policies (concerning soils, water, agriculture, forestry, biodiversity, transport, regional development etc.) involving very diverse user communities at global, European, national, regional and local level, requiring different types of information, from common multi-purpose up to specific information in terms of thematic or geographical area.

The LMCS will offer a portfolio of data and products, with different levels of elaboration (from pre-processed images to elaborated information), finding a compromise between multi-purpose requirements and specific thematic requirements, that are important for addressing European policies and for land management support.

Multi-purpose products will include pre-processed spaceborne and airborne observation products, specific reference data complementing existing reference data (e.g. European Digital Elevation Model), bio-geophysical parameters (dynamic vegetation and surface parameters in real-time at global level); a set of land use / land cover and land cover change products.

Thematic products at European or global levels such as crop forecasts, agricultural statistics, water models (quality, irrigation), environmental indicators, carbon fluxes, soil degradation and desertification models, urban and industrial areas and hot spots, will address more specific thematic requirements.

- *Marine*

The objective of the Marine Core Service (MCS) is to establish an integrated European capacity for ocean forecasting and monitoring allowing a systematic delivery of forecasts (from one day nowcasting to one month seasonal forecasting), re-analysis (time series) and scenario simulations (for climate change impact assessments):

– on sea state and dynamics (e.g. 3D currents, temperature, salinity) and primary ecosystem (surface phytoplankton and primary production) characteristics; and

– at global scale (all world ocean) with daily updates on 5-10 km horizontal grids and over European regional seas (Baltic, Mediterranean, North Sea, North East Atlantic Basin), with daily updates at customised space resolution (1-5 km horizontal grids).

As oceanographic models form the basis of its global and regional forecast services, the MCS depends on observation data from space and in-situ infrastructure and weather analysis and forecast information from numerical weather prediction models. Thematic Assembly Centres will be responsible for specific pre-processing of different parameters to be used as observation time-series and input to the global and regional Monitoring and Forecasting Centres. Regional models are foreseen for the Baltic, Mediterranean, Black Seas, Arctic Ocean, Northwest Shelf and the North Atlantic.

- *Atmosphere*

The GMES Atmosphere Core Service (GACS) provides products for three main application areas: (i) air quality, including long range transport of pollution, (ii) climate forcing and (iii) stratospheric ozone, UV and solar radiation. These products cover short term (including near real-time) to long term information needs (especially through reanalysis).

The atmospheric service will fill existing gaps in accessible information on atmospheric chemistry and composition. This will include:

– provision of Global Climate Observing System (GCOS) Essential Climate Variables (ECV's) compliant with Global Climate Observing System (GCOS) requirements;

– gridded information on atmospheric composition;

– long-term databases in order to clearly establish trends;

– reanalysis at regular intervals;

– ensuring effective access to in-situ and satellite observation data, including in near real time for services, e.g. in the field of solar energy;

– forecasting and assessment capabilities for policy development, health and other applications.

- *Emergency management*

The objective is to deliver a set of basic services to improve the capability of users to face major emergencies at national, European and global levels either within or outside Europe. It will cover information relating to natural disasters including meteorological-driven hazards (e.g. storms, fires, floods), geophysical hazards (e.g. earthquakes, tsunamis, volcanic eruptions, landslides and subsidence), and man made disasters and humanitarian emergencies.

The initial scope of the GMES Emergency Response Core Service (ERCS) is to provide rapid mapping services, delivering reference maps and assessment maps with a synthetic representation of anomalous events, their impact following effects and their time and space evolution, as well as the distribution in space and time of the available resources (rescue teams, equipment, material etc.), assets, and the actual damage. The ERCS will expand beyond the emergency response part of the crisis cycle and evolve to cover the entire crisis cycle (crisis prevention, early warning, post-crisis reconstruction and situation assessment). The products will be diversified (mapping services, forecasts and early warning systems, scenario preparation).

- *Security*

Preliminary discussions with different stakeholders have shown that security users should be offered the same rights as other user users of GMES services bearing in mind that GMES is a civil system under civil control. Experienced security actors underlined the sensitivity linked to the acquisition, handling and dissemination of geospatial information. Security users have specific needs which justify the creation of specific services.

In order for GMES services, data and information, to be used for public decision-making, most particularly but not solely for what concerns security-related services, they should fulfill basic security criteria in terms of confidentiality, anonymity, traceability as well as security of infrastructure and processes. These requirements will need to be considered by GMES services in general without hindering their overall development.

With the aim to raise stakeholder's awareness and to obtain guidance for scoping and implementation, the EU Institute for Security Studies held a seminar on the security dimension of GMES in March 2007. The discussions at the seminar identified a number of areas where GMES could have a relevant role to play in facilitating monitoring or implementation of policies, including e.g. maritime and border surveillance and global situation awareness. Following the coordination between the Commission and the General Secretariat of the Council, a number of action areas meeting policy requirements have been identified including: border surveillance, maritime surveillance and support to EU external action.

The specific support of GMES to security applications as well as the importance of correctly addressing security of information produced by GMES is currently being elaborated by the Commission. The results of ongoing analyses will be communicated at a later stage.

Key issues raised by Stakeholders

- Ensure in the definition of the initial scope for GMES services that their deliverables meet user needs (including the needs of downstream sector).
- Establish a mechanism for approval and continuous management of user feedback and requirements as well as for the validation of their implementation.
- Appropriate balance among coordination, financing and regulatory actions by the EU.
- Establish operational financing sources and associated procurement policy.

8.6. The GMES Space Component

The GMES Space Component (KSC) shall ensure sustainable provision of satellite derived Earth observation data to the GMES service component. The KSC architecture is driven by and derived from service requirements provided by the user communities represented in the overall GMES governance scheme. This requires that any investment in the space component needs to correspond to user requirements aggregated by the Commission.

The GSC is subject to a space infrastructure mission lifecycle which is driven by service requirements and which determines the roles and responsibilities of the various actors, funding sources and decision-making process. This lifecycle includes the following stages:

- demonstration stage through missions or technologies implemented with R&D funding;
- pre-operational stage with initial elements of an operational series through a mix of R&D and operational funding; and
- operational stage with recurrent elements of an operational series[26].

Stakeholders agree that the main challenge today is to ensure the implementation of the second and third stages mentioned above. This is true for a major part of KSC missions, including the ESA Sentinels and most of the national missions in Europe.

The current situation presents gaps and cannot guarantee the availability and continuity of the whole GSC mission range and mission lifecycle described above. The availability of GSC missions covering the third stage of lifecycle, i.e. recurrent elements of operational series, should be specifically considered. This would imply organising different funding and associated procurement policies.

[26] For instance, regarding the Sentinel missions, the recurrent units are defined as those units that follow after the completion of the full operational capability. In addition, it is essential that also during the operational stage R&D elements are implemented, e.g. for the development of the next generation Sentinels, which will incur the need for R&D funds.

Moreover, it is clear that at least four major functional roles are required, including coordination of infrastructure availability, procurement and operations of the operational infrastructure, and R&D for future infrastructure. These functions need to be further developed or created for sustaining an operational European capacity as shown in the following paragraphs. While the operation of national assets will clearly remain in the hands of respective national and commercial operators, the EUMETSAT and ESA capacities will be operated by European public entities that have the appropriate mandate and are technically capable of providing such operational services.

There is need to identify a decision-making process which brings together all relevant GMES Space Component partners in Europe. This process should build on the distributed architecture of the GMES Space Component. It should start with the definition and prioritisation of GMES service requirements through the general GMES governance scheme. Subsequently, these service requirements should be translated into mission and architecture requirements taking into consideration especially the available resources and plans for Earth Observation space infrastructure. ESA, as coordinator of this GMES component, should then develop an implementation plan to be steered and approved by the general GMES governance which will allocate its resources, if necessary with prioritisation decisions. At this stage, the GMES Space Component partners coordinated by ESA should then proceed with the implementation following the most appropriate programmatic scheme.

The decision-making process should take into consideration the implementation process, including decision making and funding, of individual partners. Nevertheless, there is a need to establish a process linking the various partners enabling to reach consensus and to drive the implementation (including financing) process.

Regarding financing, as the GSC capacities gradually reach the third stage of the operational lifecycle (i.e. recurrent elements of operational series), one major issue linked to the long-term continuity of the GSC is the availability of operational funding sources, notably the possibility to establish operational funding from the EU budget completing future operational funding sources at national level.

The precise content and costing of the GSC will drive the establishment of new operational budgets. Such issues are carefully examined in the long-term implementation plans for the GMES Space Component to be elaborated by ESA with EUMETSAT, Member States and other stakeholders. This process is expected to be finalised by 2009 to allow the Commission to fulfil its commitment to prepare proposals on the necessary EU operational budget.

Key issues raised by Stakeholders

- Ensure that the KSC corresponds to the requirements of GMES services
- Ensure an overall programmatic approach for a full mission lifecycle with special focus on a sustainable approach for recurrent elements of operational series.
- Identify how Member States can contribute to the GMES Space Component with their national missions and how the continuity of these missions can be ensured.
- Finalise content and costing of the GSC through overall consensus of the long-term KSC implementation plans to be coordinated by ESA.
- Identify the steps towards the establishment of operating entities and the definition of their role.
- Establish decision-making processes within the GMES Space Component and identify its involvement in the GMES overall governance.
- Establish operational financing sources and the associated industrial policy for infrastructure and data.

8.7. The In-situ Component

The in-situ observation component is based on an observation infrastructure owned and operated to a large degree by the Member States, in some cases coordinated in the frame of European or international networks. In-situ observation activities and associated infrastructure derive from a range of national, EU and international regulatory requirements and agreements or form part of research processes. None were created to meet the needs of GMES, and they generally cover a much wider field than the requirements of GMES services. In-situ data flows, and products, are often inconsistent between different collection bodies, incomplete, not well-adapted to GMES service needs (e.g. for near real time data), subject to usage conditions that can affect their ready availability, and dependent on research funding. They therefore do not have the necessary operational sustainability.

In-situ observation data provide data not available from space sources (e.g. in the marine area, data from submersible floats) or essential reference data (e.g. topographic maps), and could also be used for calibration of space data or validation of space-based derived parameters.

The existing observation infrastructure is subject to a complex pattern of ownership and management, responds to a range of national, EU and international regulatory requirements and from numerous research processes. Many national, European and international networks coordinate monitoring and the analysis and consolidation of data.

In-situ observation data flows are highly fragmented; there are significant gaps in the data; there are inconsistencies between data collected by different bodies; and

systems are not well adapted to GMES service needs (e.g. for near real time observation requirements in some cases).

Each service Implementation Group (IG) has produced its own list of essential in-situ data flows. This process has demonstrated wide differences between the requirements of the services. Given the complexity of the in-situ observation component, the European Environment Agency (EEA) has been tasked by the Commission to analyse and coordinate the in-situ observation data requirements of GMES.

Discussion among stakeholders of how to realise these requirements has brought to the surface a number of issues, including:

- concerns that Member States might not in practice, and for various reasons, be able or willing to guarantee the provision of in-situ observation input and that EU funding might need to be considered;

- a need for more clarity about what environmental communities might gain from GMES services in return for the provision of input, particularly as in practice their interest would often be in downstream services;

- what some regard as lack of transparency in the development of the initiative so far, and inadequate engagement of national authorities;

- the importance of quality control for input data for services.

A service-driven approach based on the evolving GMES Services needs to be followed. This will require close engagement with bodies in Member States and international and European coordinating bodies, which are key players in the management of data provision; global in-situ observation networks; and channels of user focus, especially in ensuring that data and products delivered by GMES services to which they contribute genuinely meet their needs – including for downstream services.

The financial responsibility for most in-situ observation data gathering and management is outside the EU framework, and GMES should not change this. But funding issues for new elements may need to be addressed in the framework of GMES funding.

Key issues raised by Stakeholders

- Reviewing organisational structures and ensuring adequate engagement of environmental bodies as both providers of data and products, and users of services.

- Identifying possible instruments of coordination, regulation or funding, shared between the EU and Member States, to facilitate the provision of *in-situ* input.

- Identification of content and costs of GMES in-situ observation component through overall consensus on the medium and long term scenarios under the coordination of relevant European institutions.

- Identification and co-ordination of the European approach on global in-situ observation

networks.

- Contributing to the continuity of data provision and a mechanism for assessing data quality.

8.8. GMES Data and Information Policy and data management

The complex GMES architecture includes data and information flowing among the different components and from/to sources outside the GMES perimeter. In particular, the observation infrastructure component produces and delivers data of various processing levels and sources. Data from this component are regularly processed by the GMES Service component (in this case, there is a flow of data between the components) in order to generate information made available to users, including the downstream sector.

Due to the complexity of an operational GMES architecture, a two-step process should be envisaged for elaborating a GMES data and information policy, based on (i) the definition of objectives and principles of a GMES Data Policy, and (ii) the implementation of these objectives and principles.

The principles of the GMES data policy are to promote the widest possible use and sharing of GMES data, to strengthen markets using Earth Observation (and especially the European downstream sector) and consequently to enable growth and job creation, to contribute to the sustainability of the provision of GMES data, to ensure adequate protection of GMES data, and to support the European public sector, including its research communities. An objective should then be that GMES data should therefore be fully and openly accessible, within the constraints and exceptions (e.g. security issues) deriving from the overall GMES legal and policy environment. This principle is not only compliant with the INSPIRE rules and in accordance with the GEOSS Data Sharing Principles, but also targets the objective of promoting the widest possible use and sharing of GMES data.

GMES data are provided in a complex legal and financial environment. Data flows will be subject to binding rules at national, Community and international level. The detailed implementation mechanisms for a GMES data and information policy will not only depend on these legal constraints, but also on the governance framework and financing model for the GMES Service in question.

Key issues raised by Stakeholders

- Achieve consensus on the high-level objectives and principles for GMES data and information policy and the related financial model.

- Identify ways to implement data policy objectives and principles.

ANNEX III

GMES SOCIETAL BENEFITS AND INDUSTRIAL IMPACT

Background

The socio-economic benefits of GMES and the expected impact on the related European industry sectors have been comprehensively characterised and documented in a series of independent studies conducted over the period 1995-2008.

The prime purpose of GMES is to provide information to support public policy. As such the GMES information services are a public good. From the available data, it seems reasonable to assume that the benefits resulting from GMES significantly exceed the associated costs for its development and operations.

Public sector investment to ensure the availability and operations of a Europeean autonomous global observing capability is a pre-requisite to achieving the long term societal benefits and facilitating the progressive participation of the private sector.

This annex provides an overview of studies conducted on societal benefits of GMES and assessments of related industrial sectors and commercial markets at European and global levels.

Two analyses of the benefits and impacts expected to result from GMES have been conducted; the "GMES Socio-Economic Study"[1] commissioned by EC was completed by ESYS in 2003, and the "GMES Socio-economic Benefits Analysis" commissioned by ESA, was completed by PriceWaterhouseCoopers in 2006. The analysis by PWC incorporated the results of 12 smaller scale cost-benefit analyses of individual services from the ESA GMES Services Elements (2002-2005). Both these studies concluded that GMES information products are public goods, i.e. the same information products can be used and reused by many different stakeholders to serve a wide range of public policies, and identified significant benefits from GMES.

The major benefit of GMES was identified as avoided costs. A more effective policy regime, using improved and up-to-date information from GMES, will avoid costs that would otherwise be incurred as a consequence of less well-informed decision making. In both studies, impact was assessed with respect to a no-GMES scenario. Thus benefits uniquely dependent upon GMES were identified. The no-GMES scenario was based on the BICEPS report, commissioned by the EC in 2003, which documents the technical baseline scenario for environmental monitoring within Europe.

Societal Benefits

The value of GMES information as a support to public policy decisions depends on several factors, such as: (i) the cost implications of a policy decision, (ii) the quality of information that is already available and (iii) the capacity of governments to exploit better information. Thus GMES information is of greatest value for policy sectors which are affected by high uncertainty associated with geospatial or environmental conditions, significant cost implications, and a lack of alternative information. For example, several of the Millennium Ecosystem Reports specifically

cite lack of such information as a major constraint for effective policy in domains such as deforestation, desertification and wetlands management. Most recently, the IPCC 4th Assessment Report identified gaps in climate observations over developing countries as an obstacle to effective policies on climate change.

The approach being taken in the on-going study of GEOSS societal benefits is consistent with the GMES socio-economic benefits studies. The GEOSS analysis also assesses benefits and impacts in terms of societal outcomes enabled by better informed decisions.

Major GMES benefits in the following EU policy domains were identified:

- Europe as a global player (climate change adaptation, global environment protection, humanitarian response);
- preservation and management of natural resources (air quality, marine environment, forest ecosystem management, civil protection); and
- sustainable growth (efficient delivery of public services).

Significant benefits were also identified in areas such as climate change mitigation and development aid (with respect to Europe as a global partner) and urban and rural policy, agriculture policy, water quality, management of wetlands (with respect to preservation and management of natural resources). However, an already established and widely accepted method for quantifying the economic value of these benefits was not available.

The benefits were grouped into three categories in order to provide insight into the timescales, external dependencies and uncertainties involved in realizing these benefits:

- efficiencies in implementing existing policies. These benefits could be realized almost immediately;
- European policy formulation benefits. Since they depend on future policy evolution, these benefits would accrue later, typically one decade hence;
- global action benefits: Since they depend on new international policy agreements, these benefits would accrue later again. Similarly, the external dependencies and uncertainties in their realization are greater. However, by virtue of their global scope, they hold the greatest potential benefits.

Industry and Markets

In addition to these socio-economic benefits, GMES will support the goals of the Lisbon Agenda of building a competitive knowledge based European economy. This concerns several industrial sectors within Europe, in particular but not only the space industry. At a global level OECD has, since 2004, been conducting an analysis of the global space economy. Input to this analysis came from the "Global Forum on Space Economics" set up in 2006, and the results ("The Space Economy at a Glance") were published in 2007.

OECD has estimated multipliers which characterise the direct impact of investment in the space manufacturing industry on OECD economies. In a cited case study, the US Department of Commerce estimated that in 2004, the US space sector was responsible for more than US$ 98 B in economic activity, i.e. approximately three times the space budget at that time. At present the satellite manufacturing turnover in Europe is approximately €5 B per annum. The planned annual investments in the GMES Space Component represent less than 8% of this and can be expected to deliver benefits to the European economy with comparable multiplier effects. In addition to the economic multipliers, investment in space also creates benefits via directs sales spin-offs. A second OECD case study demonstrates that these can be 4 to 5 times the value of the initial investment. Most recently the UK Case for Space analysis identified broader economic considerations such as the impact on job creation and the higher level of economic return achieved from investment in the space sector.

At the downstream level, the relevant GMES sector can be defined as those organisations that offer value added services based on Earth Observation (EO) data, but also large industrial sectors which integrate information derived from Earth observation in their service offer or production processes, according to the model of meteorological or geographical information. Within the downstream sector, two distinctions should be made:

- Companies that use EO data and derived information, the provision and availability of which would be affected by the introduction of GMES services, versus those that use other EO data;

- Public entities versus private actors.

The economic performance of the GMES downstream sector has been reported in three studies: a study by Euroconsult in 2007[27], and two studies by VEGA, from 2004[28] and updated in 2008[29].

Euroconsult assessed the downstream value-adding sectors of space-based applications. This concerned earth observation (EO), communication and navigation. An overview of the world and European revenues and the compound annual growth rate (CAGR) is provided in the following table.

Sector	**World revenues 2005**	**European revenues 2005**	**Europe %**	**2000-2005 CAGR Europe**
Telecom	€54.3 billion	€18.1 billion	33%	6.5%
Navigation	€17.3 billion	€2.3 billion	13%	22%
Earth observation	€1.3 billion	€0.4 billion	31%	4%
Total	€72.9 billion	€20.8 billion	29%	11%

[27] Euroconsult, 2007, Assessment of the downstream value-adding sectors of space-based applications.

[28] VEGA and Booz Allen and Hamilton, 2004, The state and health of the European and Canadian EO service industry

[29] VEGA, 2008, The state and health of the European and Canadian EO service industry in 2006

Table 1: Revenues of the downstream value adding sectors of space-based applications for 2005. Source: Euroconsult (2007). European data include Canada, an associate member of ESA, which accounts for around 10%.

The table indicates that EO is the smallest of the three value adding space segments in absolute numbers. European revenues take up around one-third of world revenues. European revenues from EO amount to approximately 2% of total European revenues of downstream value adding sectors, which is equal the share that world EO revenues have in world value-adding revenues.

The revenue figures above are for EO value adding activity undertaken on a contracted basis including public sector revenues, which account for around €150 million, mostly coming from Meteorology and Met-ocean. European data quoted above include Canada, an associate member of ESA, which accounts for around 10% of the total. The following table provides as split of total European revenues per segment, and additionally provides the growth rate in the period 2000-2005.

Segment	**Revenue in 2005**	**CAGR 2000-2005**
Meteorology	€ 211 million	2%
Defence and security	€ 65 million	5%
Oceanography	€ 49 million	10%
Natural Resource Monitoring	€ 52 million	2%
Land Monitoring	€ 13 million	2%
Total	€ 390 million	4%

Table 2. European revenues EO value adding industry per segment in 2005. Source: Euroconsult (2007). European data include Canada, an associate member of ESA, which accounts for around 10%.

Euroconsult also indicated that EO value adding industry is the only segment where, in commercial activity, the downstream sector is smaller than the upstream sector (Satellites, launches, operations and ground equipment).

The Euroconsult figures as mentioned above can be compared with the figures provided by VEGA. VEGA reports the total revenue in Europe and Canada for EO value adding industry at € 285 in 2002, growing 2% per annum on average to € 306 million in 2006. This figure does not entirely match with the € 390 million in 2005, as presented by Euroconsult. However, these revenues include public sector revenues from meteorology and met-ocean, while we understand that this is excluded in the VEGA study. If we correct for this, there is a 'gap' of around € 60 million. Part of this can be explained by the difference in base year (2005 for Euroconsult, and 2006 for VEGA), but not all. The discrepancy may arise from methodological differences.

VEGA indicates that about 30% of all revenues are from National/ESA/EC grants, hence not from customers paying for services. This figure rises to 50% for small/medium sized companies.

VEGA estimates employment in the sector to have risen from 2,900 employees in 2002 to 3,000 in 2006.An overview of employment and revenue is presented in the following table.

	2002	**2006**	**CAGR**
Revenue*	€ 285 million	€ 306 million	1.8%
Employees*	2,900	3,000	0.85%
Labour productivity (revenue per employee)	€ 98,000[30]	€ 102,000	0.93%

*Table 3. European revenue and employment. Source: VEGA. *Does not include revenue or employment generated by the public sector*

The table indicates that revenues have increased by around 2% per annum on average between 2002 and 2006, while employment evolved in a lower pace, slight under 1%. This implies that the productivity per employee has grown.

These figures from both Euroconsult and VEGA are for all EO activity, even if the company concerned is not in the "space sector". Hence they include, for example, the EO related revenues of large engineering /survey companies that use EO as part of their overall business. VEGA also estimated that the value adding products and services provided by the EO value adding industry are made up for 80% from a combination of spaceborne plus aerial or ground data. The OECD[31] indicates that in the total EO downstream sector (commercial remote sensing, including data sales), the revenues amounted to € 2 billion worldwide (satellite plus aerial component) in 2003. It was estimated that the satellite component amounted to one third of the total.

Conclusion

The GMES direct downstream sector employs around 3,000 persons in 2006. The total revenue in Europe amounts to € 250 - 300 million in 2006, excluding revenues by the public sector, which amount around € 150 million. These values include revenues from grants; corrected for this, revenues from paying customers amount to € 175 -210 million, excluding revenues by the public sector.

According to VEGA, there are 151 companies in Europe and Canada which can be defined as value adding companies (2006), excluding the public sector. In 2002 there were 162 companies identified. The decrease can be explained by consolidation activities that have taken place.

The sector is primarily made up of small and medium sized companies. The distribution among categories is presented in the following table.

30 VEGA reports revenue per employee being € 107,000, which is based on a correction for outliers in the survey sample. However, these outliers were not excluded when calculating total revenue, which does not seem methodologically sound. Therefore this table presents the 'raw' figures without correction for outliers.

31 Space 2030, Tackling society's challenges, OECD, 2005

Size class	Number of companies
Small (0-10 employees)	87
Medium (11-60 employees)	68
Large (>60 employees)	6
Total	151

Table 4. Size distribution of value adding companies (Europe and Canada). Source: VEGA

On average, the sector employs 20 persons per company and generates a turnover of around € 2 million per company. VEGA notes that profitability is highly concentrated with 89% of the profits coming from just 5 companies. VEGA indicates that the main operational centres of EO activity are in the UK and Germany, with France, Italy and Spain also making a significant contribution.

Conclusion

The GMES downstream sector is a relatively small sector, composed of around 150 companies. More than half of these companies are small companies employing less than 10 persons. The average turnover amounts to € 2 million per company. Note that the public sector is not included in these figures.

The use of GMES information in large industrial sectors such as energy, agriculture, water resources, etc should be comparable to those of similar information such as meteorology or cartography and remains to be assessed.

VEGA indicates that about 30% of all revenues of the EO value adding sector is from National/ESA/EC grants, hence not from customers paying for services. This figure rises to 50% for small/medium sized companies.

The European EO value adding sector takes up around one-third of global revenues. Both the below revenue and non weighted revenue tables give a picture of the geographical market reach of companies. The graph indicates that the majority of the users or customers of European value adding companies are located in the country of the company itself. The revenue weighted analysis shows that where there are activities outside Europe, the market is dominated by the activities of large companies operating in Asia and North America according to VEGA.

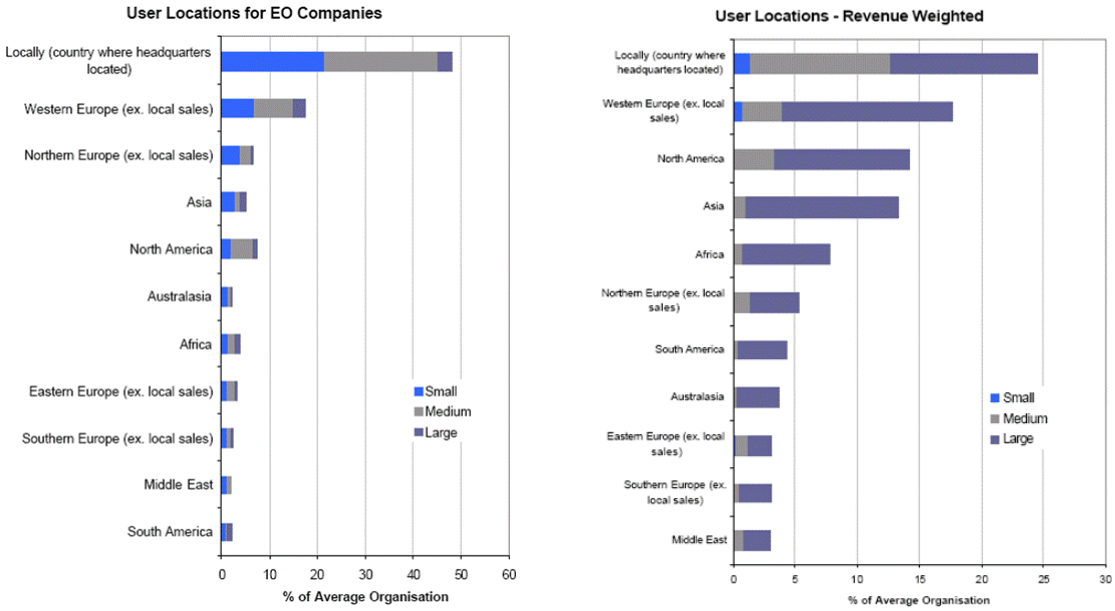


Figure : user locations for EO companies. Source: VEGA

Overall, nearly 10% of all European products are also sold to global users (VEGA 2008). Historical comparisons of growth in EO Services by customer location shows that in the period 2003 – 2006 there was a growth in products sold globally.

In terms of the profitability trend of the EO service industry as a whole, profitability is typically below 10% and concentrated in a few larger companies, with only 89% of profit value across the sample companies from the VEGA survey (VEGA 2008) being delivered by five organisations. In 2006, a significant profit (greater than 1 million Euros) is limited to just five companies in the research sample[32], including all the large respondents and just one medium sized organisation.

Whilst it is not directly related to profitability, the current ratio[33] of the industry has been analysed in the literature. Whilst the trend is upwards in the EO value adding industry, many companies remain below the 'safe' level of 1 (for the current ratio) and the industry remains below benchmarks. For example, current ratios for engineering companies in the EU are 1.5 and in the US 1.1, while the EO industry as a whole is 0.89. (Galant 2007).

Despite issues with funding relating to support from the public institutions[34], the EO sector shows above average investment in R&D compared with other sectors, with the average R&D expenditure accounting for 27.5% of EO revenue. It is important to

32 Source: VEGA (2008). It should be noted that profitability of EO companies is shown by this study to be typically presented in low single figures as percentage of revenue, variable between companies and volatile year on year.

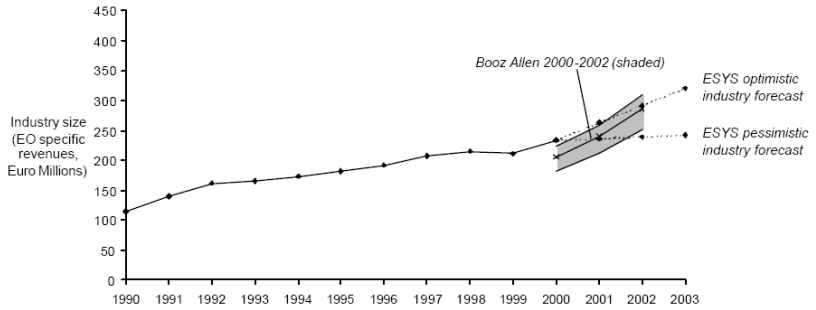
33 An indication of a company's ability to meet short-term debt obligations; the higher the ratio, the more liquid the company is. Current ratio is equal to current assets divided by current liabilities.

34 Issues being that revenues are primarily generated from operational services but revenues grants still comprise about a quarter of company revenues on average (VEGA 2008). Organisations awarding grants to the EO sector included National public grants, European public grants - ESA EC & other (VEGA 2008)

note that technical development activities in the EO sector are funded by clients / public funds and not direct by internal investment (VEGA 2008).

GMES aims at the delivery of information services. At the global level, a recent study of total revenues for meteorology, airborne and satellite remote sensing estimated global revenues of the order US$ 7B for 2007 rising to approximately US$ 10B in 2012. These figures include the larger airborne remote sensing data market. Concentrating only on EO, the projected growth is approximately 8% per annum. These estimates are consistent with an independent study by Euroconsult as well as related studies of the market for Geographic Information Systems.

Since 1995, total revenue of the European and Canadian EO service industry has been regularly assessed by a series of independent studies commissioned by both EC and ESA. Three snapshots of annual revenues within the industry (including both R&D grants and commercial sales) were compiled in 1995, 1998 and 2001 followed by two detailed assessments of the state and health of the EO service industry in 2004 and most recently in 2007. These studies show a consistent picture – Europe earns between 33% and 50% of the global commercial market for EO based services and this market is growing at approximately 7 – 8 % per annum. The most recent assessment estimates total European and Canadian EO service revenue (not including data sales) as approximately €306 M for 2006. In addition, combined data sales and ground station procurement revenues were estimated to be approximately €106M.



Historic evolution of total revenue in the European EO service industry – source ESYS and Vega

In comparison, the global commercial revenues in the much larger satellite telecommunications and navigation service sectors are estimated at approximately US$ 55 B per annum and US$ 21 B per annum respectively.

Relevance for GMES implementation

As well as assessing the space economy, OECD has also formulated a set of recommendations on emerging economic sectors, including the space sector. These recommendations are of direct relevance to GMES. In particular, the context cited for economic value to be delivered from space is centred on a set of key societal needs and challenges including environmental, managing natural resources and agriculture, security, mobility and challenges related to the move to the knowledge society.

OECD recognises that the financial sustainability of operational space systems delivering public good services remains a key challenge. Thus the recommendations, listed below, concern the role of government in strengthening the contribution of space in the context of global societal challenges:

- Implement a sustainable space infrastructure:

Implement a sustainable user oriented space infrastructure

Develop and maintain cost-efficient space transport and servicing infrastructure

- Encourage public sector use:

Encourage public sector use at national level, including creation of mechanisms for the effective generation and use of space based data and strengthening cooperation between user ministries and space agencies

Encourage public sector use at international level, including encouragement of the use of space applications for global disaster prevention, treaty monitoring and fostering social and economic development

- Encourage private sector participation:

Create a supportive legal and regulatory environment for commercial activities

Strengthen private provision of space based goods and services, including fostering of public procurement from the private sector and privatization of commercially viable business oriented government activities

- Foster a more supportive international business and finance environment

Although GMES was initiated prior to the OECD analysis, the GMES implementation strategy closely matches the independent OECD recommendations. At present a sustainable GMES space observation infrastructure is being built up by sustaining existing missions and developing new missions (e.g. the ESA Sentinels). The requirements for the Space Component are based on documented needs of public sector users derived from long term EU policy goals. Public sector usage of GMES (space and in-situ observation and service components) is being fostered by the implementation of dedicated GMES services. Specific mechanisms to ensure service to users at international and national level are being put in place. Over the next 5 years, GMES implementation will progress from the present pre-operational services and preliminary space component to a fully operational service capability with the launch of the first dedicated Sentinel mission in 2012. Thereafter, long-term sustainability of public sector usage and realisation of the socio-economic benefits is contingent on the establishment of stable governance and funding scheme for GMES operations. This will encourage private sector participation by establishing stable conditions within which industry and commercial operators can undertake their own independent initiatives and investments.

The conditions under which GMES observations and core services will be made available to users and service providers are an important factor in the encouragement of both public sector use and private sector participation. The PWC reports highlights

that an inappropriate access policy for GMES data and services would inhibit public sector use and private sector initiatives, and thus limit the realisation of socio-economic benefits. Several studies have demonstrated that an effective means to maximize public use and private sector development is to ensure free access to the basic observation data and some basic services via public funding. The economic benefits of such a policy were documented in a 1998 study which compared US and EU data access policies, and assessed the associated economic impacts. A 2001 study by KPMG demonstrated that free data access offered by US Government Agencies resulted in greater public sector utilisation and higher resulting economic activity than in comparable economies that implemented a policy of cost recovery via data sales.

ANNEX IV

POLITICAL FRAMEWORK FOR GMES AND STEPS AHEAD

The Global Monitoring for Environment and Security (GMES) initiative was launched in 1998 through the Baveno Manifesto[35] signed by a number of European space agencies, the Commission, ESA and EUMETSAT. In its Resolution of 16 November 2000 on a European space strategy (2000/C 371/02) Council noted "the importance of satellite data in managing the environment and regional planning, in safeguarding human life by managing the consequences of disasters, in monitoring risks and in improving civil security, and noting the need to develop, without delay, operational or pre-operational application services," and called on "the Commission, together with the ESA and the Member States, to complete the outline for this initiative, starting from the needs of users and civil society, so that specific implementing proposals can be drawn up by the end of June 2001".

In its Communication entitled "Global Monitoring for Environment and Security (GMES) - Outline GMES EC Action Plan - (Initial Period: 2001 – 2003) of 23.10.2001, COM(2001) 609 final reiterated the objective of to develop operational systems and services by 2008, making reference to Commission Staff Working Paper - Joint document from the European Commission services and European Space Agency[36]. Following this Communication, Council adopted the Resolution of 13 November 2001 on the launch of the initial period of global monitoring for environment and security (GMES), in which it was mentioned that the Council "URGES the Commission to start, in close coordination with the ESA, the initial period of global monitoring for environment and security (GMES), […] STRESSES the importance of the initial period in preparing the next phase of GMES…".

After the end of the initial period of GMES, the Commission adopted the Communication entitled "Global Monitoring for Environment and Security (GMES): Establishing a GMES capacity by 2008 - (Action Plan (2004-2008))" of 3.2.2004, COM (2004) 65 final. The Communication underlined that "from the experience gained during the initial period, there is significant support to justify the further development of the GMES, the objective being to achieve a "core capacity", i.e. the initial set of services and the supporting components needed to deliver these services on an operational basis by 2008. The capacity is to be built-up gradually, based on clearly identified priorities and by using existing elements wherever possible." This approach was supported by the European Parliament[37].

In its Communication entitled "Global Monitoring for Environment and Security (GMES):From Concept to Reality" of 10.11.2005, COM(2005) 565 final, the Commission reiterated that the he command of information on environment and security has geostrategic implications, referring to the above mentioned to the political mandate expressed at the June 2001 Gothenburg summit and in the later Council Resolution (see above) towards "achieving by 2008 an operational and autonomous European capability". Further, it was recalled that the

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35 The initial name of the initiative stated in the Baveno Manifesto was Global Monitoring for Environmental Security.

36 SEC(2001) 993 of 16/06/2001.

37 B5-0045/2004 European Parliament resolution on the action plan for implementing the European space policy.

second Space Council has confirmed that GMES will be the second EU flagship of space policy after Galileo.

In the orientations of the second Space Council, it was recalled that the EU will focus on space-based applications to contribute to the achievement of its policies, particularly Galileo and Global Monitoring for Environment and Security (GMES). The Third Space Council reaffirmed "the strategic dimension of GMES, which should be user-driven and service-oriented, meeting initially public sector needs through services delivered in the most efficient way , where possible by the private sector;" and supported "a phased approach for the implementation of GMES based on clearly identified priorities, starting with the development of three fast-track services on Emergency Response, Land Monitoring, and Marine Services due to begin their pilot phase as operational services by 2008, with other services to be developed and validated in due time…"

In its Resolution of 21 May 2007 on the European Space Policy[38], the Space Council recognized the strategic value of sustainability for GMES and reaffirmed the objective for an operational and autonomous capability for GMES before the end of 2008. it was emphasised that the European Commission needs to propose for GMES in due time and after full consultation with Member States and ESA, arrangements for:

(i) financing, including facilitation of funding by the users,
(ii) operational infrastructures, and
(iii) effective management — to become fully operational and to ensure sustainable services responding to identified user needs,

Finally, in its Resolution of 26 September 2008 entitled "Taking forward the European Space Policy", the Space Council identified the need to elaborate an action plan leading to the setting-up of an EU GMES programme, aiming at securing the continuity of GMES services and of the critical observation data which they require. This action plan should include:

- an approach for the overall GMES governance;
- a plan for sustainable funding of GMES, based on an assessment of the overall financing needs for GMES and the definition of the budgetary strategy at national and European levels;
- the definition of operational service delivery mechanisms for each GMES service;
- the definition between the EU and Member States of a process to formalise their commitments to contribute to GMES through existing *in-situ* observation and service infrastructures;
- τhe identification of the role of the GEO initiative and other intergovernmental or
- multilateral initiatives, such as CEOS, in accessing the whole range of data available, as
- well as the contribution of GMES to these international endeavours;
- a process to establish a comprehensive data policy for all data generated by the GMES system.

The Space Council of 26 September 2008 also welcomed the intention of the Commission to address all of these issues in a Communication to be adopted by the end of October 2008,

[38] 2007/C 136/01.

having consulted with the main stakeholders, in particular agreeing with ESA an overall programmatic approach for the GMES Space Component.

The details of the action plan, which contains all the major steps to be taken, will be elaborated in the course of 2009. Further, it is envisaged that in 2009, the Commission will propose a Basic Act concerning a “bridge financing” of operational activities in the period 2011 – 2013, accompanied by a detailed assessment of the costs and the impact of such activities. The funding of activities in the next financial perspective, starting in 2014, will be covered by an additional Basic Act to be adopted before the end of 2013.