

## The use of space for Civil Protection in Europe

Laurence Nardon  
and Christophe Venet

November 2011

Natural and man-made<sup>i</sup> disasters are not new in the history of mankind, although recent trends indicate an increasing occurrence of such events<sup>ii</sup>. What has changed in the last decades is the socio-economic costs of such events<sup>iii</sup>. While the number of people actually killed by natural disasters decreased between 1900 and 2010 due to better overall preparedness, the number of people *affected* by natural disasters has increased significantly since the mid 1960s, due to higher concentration of industry and population centers<sup>iv</sup>. The figures for 2010 illustrate this trend: 373 natural disasters killed 296,800 people, affected 208 million others and cost around US\$110 billion<sup>v</sup>.

Developed countries, or *Very High Human Development Countries* (VHDC), suffer their fair share of natural disasters. The March 2011 tsunami in Japan, the 2010/11 floods in Australia, or the 2010 and 2011 earthquakes in New Zealand are very recent examples. Since 1990, natural disasters in VHDC have killed more than 127,500 people, affected 59 million others and cost more than US\$1,543 billion<sup>vi</sup>.

In this perspective, the EU shows growing interest in Civil Protection (CP), whose goal is “to minimise the impact of catastrophic events”<sup>vii</sup>, and has recently brought to the task the idea of using space tools in a coherent and systematic manner. The potential of the three space applications (observation, communication and navigation) for the mitigation and management of disasters is well-known<sup>viii</sup>. The central challenge in Europe is to overcome technical and governance challenges to make use of space technologies in support of CP most efficiently. To sum it up, there is both an increasing need for concrete action at the European level and an increasing demand for political decisions in this field. There is no European “grand strategy” on space for CP as of yet. At the same time, the EU is currently rethinking its CP architecture, which constitutes a political window of opportunity to include the space component into it. As a matter of fact, the use of space for CP is currently under the spotlight, as the Polish EU Presidency has placed the topic on its agenda<sup>ix</sup>.

To understand what is at stake, this paper will lay down what CP means in the European context (1) and describe the role of space in this respect (2) before showing that the use of space for CP in Europe is associated with important political benefits (3).

Europe is increasingly considering space as a useful tool to support Civil Protection (CP). Through a demand-driven approach, it intends to create new services tailored to the needs of the CP community.

Laurence Nardon is Head of the Space Policy Program, and Christophe Venet is Research Associate to the Space Policy Program.

Ifri is a research center and a forum for debate on the major international political and economic issues. Headed by Thierry de Montbrial since its founding in 1979, Ifri is a non governmental and nonprofit organization. As an independent think tank, Ifri sets its own agenda, publishing its findings regularly for an international audience. Using an interdisciplinary approach, Ifri brings together political and economic decision-makers, researchers, and internationally renowned experts to animate its debate and research activities. With offices in Paris and Brussels, Ifri stands out as one of the rare French think tanks to have positioned itself at the very heart of the European debate.

*The opinions and remaining errors are the responsibility of the authors alone.*

ISBN: 978-2-86592-934-4  
© All rights reserved, Ifri, 2011



## Civil Protection in Europe

The concept of CP in Europe emerged at the national level during the 1980s. As a consequence, the main task of the European CP architecture is to coordinate national activities and to pool national resources efficiently.

### *The concept of Civil Protection*

The concept of CP was shaped and defined in the early 1980s in France and Italy, two countries where the exposure to disasters has always been high. European nations put emphasis on different risks, depending on their specific geography or climate (earthquakes and forest fires for southern Member States, technological or industrial risks of a smaller scale for northern Member States)<sup>x</sup>.

The objective of CP in Europe is to “better protect people, their environment, property and cultural heritage in the event of major natural or man-made disasters occurring both inside and outside the EU”<sup>xi</sup>. CP has two major tasks: a political and social one -interact with the political and social institutions in order to achieve a consensus on a number of issues, such as land use; and a technological one -use the most advanced and efficient tools to observe, predict and manage natural disasters<sup>xii</sup>. Space applications apply to the second task.

CP actions fit into the well-known concept of *Emergency Management Cycle* that identifies four phases: Mitigation activities aim at decreasing the probability of future disasters and reducing their effects. Typical mitigation actions include improving land use management, educating the public or implementing safety procedures. Preparedness enables to build emergency management capacity before a disaster. Its main objective is to minimise damage. The Response phase concerns the immediate assistance after a disaster. The Recovery phase takes place after the disaster<sup>xiii</sup>.

In Europe, the implementation of Civil Protection is rooted in the concept of intra-European cooperation. When disasters occur in single EU Member States, emergency assistance is often required from other Member States. It is thus helpful to rely on an established mechanism rather than on ad hoc arrangements. In addition, individual Member States often have very specific expertise, and it makes sense to pool these national capabilities<sup>xiv</sup>. The principle of subsidiarity is also at the heart of the European CP mechanism, as the primary responsibility for dealing directly with disasters remains at national level<sup>xv</sup>. The institutional architecture of CP in Europe reflects these features.

### *The architecture of Civil Protection*

The European Commission (EC) plays a central role in the establishment of a European disaster response that intends to become more coherent, more effective, and more visible<sup>xvi</sup>. The two major objectives are to “strengthen individual EU response instruments” and to “ensure consistency and synergies between the different instruments, to the benefit of the coherence of the international response”<sup>xvii</sup>.

To facilitate reinforced cooperation in the field of CP, a *Community Civil Protection Mechanism* (CCPM) was established in 2001. Operated by the EC, it relies on the *Monitoring and Information Centre* (MIC) and the *Common Emergency and Information System* (CECIS)<sup>xviii</sup>. A particular focus on the MIC is needed, as it constitutes the operational heart of the CCPM. The MIC gives Member States access to a platform collecting information on all the available national CP means. In case of a natural disaster, Member States and third countries can send a request for assistance to the MIC, which in turn forwards the request to all participating countries. It then gathers the responses of these countries and send them back to the requesting country, which can choose the help available which best fits its needs<sup>xix</sup>.

The Lisbon Treaty consolidates this architecture. Article 196 gives a legal basis to EU action in the field of CP; Article 222 introduces a Solidarity Clause, establishing an obligation for Member States to assist each other in the event of a natural or manmade disaster on EU territory<sup>xx</sup>.

The area of CP in Europe seems well organised, taking into account national specificities and

responsibilities, and leaving the EC to coordinate efforts in the most efficient way. The effective use of space assets could now add a further dimension to CP in Europe. However, it has to be noted that the EU does not possess its own space capabilities to be used in support of CP.

## The role of space in Civil Protection

Space would play a crucial supporting role in all four phases of the Emergency Management Cycle. In addition, there is an increasing trend towards bringing together CP and humanitarian assistance.

### *An efficient tool*

Satellite applications offer inherent advantages over terrestrial solutions, as they can deliver global data on a continuous basis to any geographical location<sup>xxi</sup>. Space-based services can offer support along the full Emergency Management Cycle<sup>xxii</sup>.

During the Mitigation and Preparedness phase, Earth Observation (EO) satellites can contribute to baseline mapping, identifying disaster-prone areas (for floods, droughts or forest fires for example), and thus facilitating the implementation of appropriate mitigation measures. Similarly, EO satellites can be used to monitor critical infrastructures, such as pipelines or oil refineries, and thus reduce industrial risks<sup>xxiii</sup>. Meteorological satellites are also useful for the forecasting and monitoring of tropical cyclones<sup>xxiv</sup>, as well as for the prediction of flooding. Satellite communications can be used during CP training exercises<sup>xxv</sup>. Finally, Global Navigation Satellite Systems (GNSS) and radar satellites can monitor earth crustal motions, thus helping to assess earthquake-prone areas<sup>xxvi</sup>.

Space applications are particularly precious during the Response phase, as they provide real-time information. As terrestrial communication networks are often interrupted after disasters, satellite communications allow the connection of logistical, rescue and first responder resources<sup>xxvii</sup>. In this respect, satcom is probably the most crucial application for disaster management, as it ensures the integrity of the chain of command. EO applications enable precise damage assessment mapping and provide vital information to rescue teams on the ground by determining safe transportation routes or safe evacuation zones for example<sup>xxviii</sup>. Last but not least, GNSS is useful to optimise the search and rescue activities as it enables real-time localisation of rescue teams and equipment<sup>xxix</sup>.

In the Recovery phase, satellite communication applications provide back-up solutions until the recovery of terrestrial communication infrastructure while EO applications provide environment recovery maps that can be regularly updated<sup>xxx</sup>.

Space assets are not only supporting the Emergency Management Cycle, but also crisis management in a broader understanding, including in particular humanitarian assistance. In this perspective, there is a trend to bring the MIC closer to the EC's DG ECHO (European Community Humanitarian Office).

### *Current and planned capabilities*

The flagship programmes GMES and Galileo will support European CP activities once they become operational. GMES in particular, will provide emergency response services to cope with natural disasters, technological accidents, humanitarian crises and civilian-military crises. The FP7 SAFER ("Services and Applications for Emergency Response") project already provides pre-operational services<sup>xxxi</sup>. In addition, the 2012 FP7 work programme for space will focus on space in support of the *non-response* phases of the crisis management, including risk and vulnerability mapping and support to emergency recovery<sup>xxxii</sup>.

The main objective is to build a European integrated space architecture for crisis response<sup>xxxiii</sup>. Given the national-centered CP architecture in Europe, the key issue here is interoperability. In addition, a user-driven approach was adopted to develop new services for the CP community. ESA's *Integrated Applications Promotion* (IAP) programme focuses on user-demand to develop

tailored operational services, including CP<sup>xxxiv</sup>.

As a matter of fact, ESA has already launched a number of initiatives to fully reap the potential of space assets in support of CP. The *Short Term Action Plan* launched in 2006 aimed at improving the overall operational capabilities of CP agencies in Europe by fostering the use of satellite communication. Similarly, the CiProS project launched in 2007 helped defining the space-related requirements of European CP agencies. Surveys were conducted among the European CP community to identify their needs in terms of satellite services. Finally, two other projects were exclusively focusing on satellite communication services (*IP-based Services via Satellite for European Civil Protection and Decision*)<sup>xxxv</sup>.

Even though all three space applications are relevant, most of the recent initiatives in the field of space for CP focused on satellite communications, which is also one of the priorities of the Polish EU Presidency. The objectives are to improve interoperability, to increase the availability of space assets in case of disasters and to provide cost-effective services<sup>xxxvi</sup>.

The approach to space for CP in Europe is very pragmatic and incremental. Indeed, CP is a policy area that is less prone to governance problems that constitute the traditional burden of the *European Space Policy* (ESP). This owes to the precise distribution of tasks and responsibilities: the primary responsibility for CP lies with individual Member States; the EC is in charge of coordinating and increasing the efficiency of national responses; and ESA is providing a precious tool to end-users by tailoring space-based services in support of CP. The actual political gains associated with the use of space assets for CP are justifying these efforts.

### **Political benefits for Europe**

The systematic use of space for CP could also bring substantial political benefits to Europe:

#### *Increasing the visibility of space*

A Eurobarometer survey conducted in 2009 on the perception of space issues by European citizens showed mixed results. For example, while 20% of the people surveyed pledged for an increase of budgetary resources for space, 23% had the exact opposite view. Similarly, 42% of the respondents were not aware of European EO satellites<sup>xxxvii</sup>. This reflects a chronic shortcoming of the ESP, namely the general lack of awareness about space issues among the European population.

Meanwhile, “the primary aim of CP is to make the public aware of the risks it faces and offer reassurances that adequate resources are available to minimise those risks<sup>xxxviii</sup>. CP is not only about providing tangible emergency responses after a disaster, but also about creating a sense of security among the population. Using space tools to provide this sense of security to the citizens, and communicating about it could enhance general awareness on the concrete benefits of space for earth-bound policies.

#### *Binding smaller States to the European Space Policy*

The added-value of space for CP activities could constitute a strong incentive for smaller European States to take part more actively in the ESP. Indeed, one of the main imbalances within the ESP is the discrepancy between a few established spacefaring nations and a majority of smaller States with fewer industrial capabilities. Central and Eastern European countries for example, focus too much on the industrial aspects of the ESP to realise that the downstream application sector could also offer them huge societal benefits. This is precisely the rationale for a demand-driven approach such as implemented in the case of space services for CP. It is already an encouraging sign that the Polish EU Presidency is taking steps to foster space for CP, and that the IAP *Ambassador Platform for the Central & Eastern European Region* is taking the lead in establishing space for CP as a topic on the European public agenda<sup>xxxix</sup>.

#### *Fostering a broader security concept*

The use of space for CP is very much in line with the broadening of the security concept.

Indeed, space applications for CP are often associated with security applications in the wider sense, coming under the umbrella of “crisis management”<sup>xi</sup>. The debate on the scope of the security concept is politically loaded, as it mirrors conflicts on political contents and strategies<sup>xii</sup>. As a matter of fact, there is no political consensus yet in Europe on the sensitive questions of military uses of space assets<sup>xiii</sup>. By focusing on more neutral areas such as CP and by anchoring security-related space applications in a broader framework including economic, ecological, natural or humanitarian risks, Europe may overcome the political obstacles linked to military space. In addition, this “broader security approach” allows for incremental and concrete steps, focusing on the real user needs of the European security community. Finally, it also fosters a specifically European approach to security from space, in line with the “formative and principled” identity<sup>xiiii</sup> Europe is seeking in this field.

#### *Strengthening Europe as an international leader*

CP has an internal and an external dimension, as Europe is not only responding to intra-European disasters, but is also providing support actively for disasters hitting other parts of the world. International CP is embedded in multilateral cooperation frameworks, such as the Tampere Convention for satellite communications, or the International Charter on space and major disasters for EO. Giving Europe strong space systems to deal with natural and man-made disasters will also enhance its credibility and prestige as a partner in these multilateral endeavours.

#### **Conclusion**

The use of space for CP illustrates some of the key priorities of the ESP: it focuses on space for the benefit of the citizens; it raises Europe’s profile on the international scene; it is in line with the Europe 2020 strategy by encouraging innovative applications; it fosters broad institutional cooperation arrangements and it contributes to Europe’s security. In a context where the future of the two flagships is uncertain, this should constitute a strong case for the usefulness of European space applications.

Until now however, the use of space to support CP is not fully integrated at the European level, as it is relying on intergovernmental cooperation mechanisms. A first concrete suggestion to increase the efficiency of the EU CP mechanism could be to provide the MIC with its own space capabilities. A second idea could be implemented in the framework of EU humanitarian assistance actions. DG ECHO is already providing emergency funds for NGOs on the field in the case of a natural disaster or a humanitarian crisis. It could go one step further, by providing satellite services to these NGOs, thereby giving a more tangible reality to the use of space for crisis management.

<sup>i</sup> e.g. of industrial or technological nature. The difference between natural and man-made disasters can be seen as arbitrary though, as both factors are intertwined in many cases, the best example being the tsunami of March 2011 in Japan leading to a major nuclear disaster.

<sup>ii</sup> Center for Research on the Epidemiology of Disasters (CRED). <http://www.emdat.be/>

<sup>iii</sup> United Nations International Strategy for Disaster Reduction (UNISDR). « Guidelines. National Platforms for Disaster Risk Reduction. », March 2007.

<sup>iv</sup> CRED. « Natural Disasters Trends » <http://www.emdat.be/natural-disasters-trends>; Lesourne, Jacques. « L’Etat submergé. Le nouveau contexte des catastrophes. », in: T. de Montbrial and P. Moreau-Defarges (Eds.), Ramses 2012, p. 89-91.

<sup>v</sup> UNISDR. « Killer year caps deadly decade – reducing disaster impact is “critical” says top UN disaster official », 24 January 2011.

<sup>vi</sup> CRED. « Disaster Data: A Balanced Perspective », CRED Crunch No. 24, July 2011.

<sup>vii</sup> UNISDR et. al. « The structure, role and mandate of Civil Protection in Disaster Risk Reduction for South Eastern Europe », p. 3.

<sup>viii</sup> Venet, Christophe « L’outil spatial. D’Haïti à Fukushima, l’espace à la rescousse de la Terre », in: T. de Montbrial and P. Moreau-Defarges (Eds.), Ramses 2012, p. 104-107.

- <sup>ix</sup> Specifically, the Polish Presidency organised a high-level workshop linking space and CP on 19-20 July 2011, « An integrated approach to more effective crisis communication ».
- <sup>x</sup> UNISDR et. al. op. cit., p. 3.
- <sup>xi</sup> European Commission. « European Civil Protection » [http://ec.europa.eu/echo/civil\\_protection/civil/prote/cp01\\_en.htm](http://ec.europa.eu/echo/civil_protection/civil/prote/cp01_en.htm)
- <sup>xii</sup> UNISDR et. al. op. cit., p. 4.
- <sup>xiii</sup> Klock, Erich and Trögeler, Mildred. « Space Applications for Civil Protection » ESPI Report 37, September 2011, p. 9.
- <sup>xiv</sup> UNISDR et. al. op. cit., p. 3.
- <sup>xv</sup> European Commission. « European Civil Protection » [http://ec.europa.eu/echo/civil\\_protection/civil/prote/cp01\\_en.htm](http://ec.europa.eu/echo/civil_protection/civil/prote/cp01_en.htm)
- <sup>xvi</sup> European Commission. « Towards a stronger European disaster response: the role of civil protection and humanitarian assistance » COM(2010) 600 final, 26 October 2010.
- <sup>xvii</sup> Ibid.
- <sup>xviii</sup> UNISDR et. al. op. cit., p. 6.
- <sup>xix</sup> Ibid.
- <sup>xx</sup> Official Journal of the EU. « Treaty on the Functioning of the European Union », Volume 23, 30 March 2010.
- <sup>xxi</sup> Doldirina, Catherine « Case for space. Space applications meeting societal needs », ESPI Report 7, October 2007.
- <sup>xxii</sup> Klock, Erich et. al. « The use of satellite applications to enhance Civil Protection operational effectiveness », ESPI presentation, 19 July 2011.
- <sup>xxiii</sup> Venet op. cit.
- <sup>xxiv</sup> Lafeuille, Jérôme « Environmental threats and space responses », WMO Space Program presentation, 12 December 2007.
- <sup>xxv</sup> Kolodziejczyk, Tomasz « Crisis communication & satellite input », Plans of the Polish Presidency in the EU and needs of Civil Protection, May 2011.
- <sup>xxvi</sup> « GNSS and remote sensing for disaster management & Earth's environment monitoring in Indonesia », Technical presentation, 47<sup>th</sup> session of COPUOS, February 2010.
- <sup>xxvii</sup> Futron/GVF « Why satellite communications are an essential tool for emergency management and disaster recovery », White Paper, November 2005.
- <sup>xxviii</sup> Kolodziejczyk op. cit.
- <sup>xxix</sup> Schmitt, Tiphaine « Use of space technologies by French Civil Protection authorities », Presentation at the ESPI CP workshop, 5-6 May 2011.
- <sup>xxx</sup> Kolodziejczyk op. cit.
- <sup>xxxi</sup> SAFER website [http://safer.emergencyresponse.eu/site/FO/scripts/myFO\\_accueil.php?lang=EN](http://safer.emergencyresponse.eu/site/FO/scripts/myFO_accueil.php?lang=EN)
- <sup>xxxii</sup> European Commission « Work Programme 2012. Cooperation. Theme 9. Space » C(2011)5068 of 19 July 2011.
- <sup>xxxiii</sup> Naja, Géraldine « Space for Civil Protection: the European context » Presentation at the ESPI CP workshop, 5-6 May 2011.
- <sup>xxxiv</sup> Ginati, Amnon « ESA creating value, among the value chain » Presentation at the ESPI CP workshop, 5-6 May 2011.
- <sup>xxxv</sup> Klock, Erich and Trögeler, Mildred op. cit., p. 13-17.
- <sup>xxxvi</sup> Ibid., p. 46.
- <sup>xxxvii</sup> European Commission « Space activities of the European Union. Analytical report » Flash Eurobarometer 272, October 2009.
- <sup>xxxviii</sup> UNISDR et. al. op. cit., p. 3.
- <sup>xxxix</sup> The IAP Ambassador Platform for CEER organised for example a workshop on Space for CP in May 2011. [http://www.espi.or.at/index.php?option=com\\_content&view=article&id=669:espi-holds-workshop-on-space-for-civil-protection&catid=39:news-archive&Itemid=37](http://www.espi.or.at/index.php?option=com_content&view=article&id=669:espi-holds-workshop-on-space-for-civil-protection&catid=39:news-archive&Itemid=37); and published a subsequent study: Klock, Erich and Trögeler, Mildred. « Space Applications for Civil Protection » ESPI Report 37, September 2011.
- <sup>xl</sup> See for example: Naja, Géraldine. op. cit.
- <sup>xli</sup> Daase, Christopher « Der erweiterte Sicherheitsbegriff » Sicherheitskultur im Wandel, Working Paper 1, 2010.
- <sup>xlii</sup> This is particularly the case for the two flagship programmes Galileo and GMES. See: Nardon, Laurence and Venet, Christophe « The Europe & Space Series » # 1,2 and 3. <http://www.ifri.org/index.php?page=les-e-notes-du-centre&id=7>
- <sup>xliiii</sup> Rathgeber, Wolfgang and Remuss, Nina-Louisa « Space security. A formative role and principled identity for Europe » ESPI Report 16, February 2009.