

Making Space-based Technologies Available to Developing Countries for Improved Risk Reduction and Disaster Management

S. Camacho ^a, J-L. Bessis ^b, H. Mehl ^c

^a United Nations Office for Outer Space Affairs (OOSA)

^b Centre National d'Études Spatiales (CNES)

^c German Aerospace Center (DLR)

Follow up to UNISPACE III

The Third United Nations Conference on the Exploration and Peaceful Uses of Outer Space (UNISPACE III) made 33 major recommendations on the use of space science and technology to provide solutions for problems of global and regional concern.

In 2001, COPUOS established Action teams, led by Governments to implement the recommendations

Action Team on Disaster Management

Mandate from UNISPACE III:

Study and recommend how to implement “an **integrated operational global system**, especially through international cooperation, **to manage natural disaster** mitigation, relief and prevention efforts **through Earth observation, communications and other space-related services**, making the maximum use of existing capabilities and filling gaps in worldwide coverage.”

Activities

- The Action Team first meet on occasion of the 52nd IAC in Toulouse in October 2001.
- Action Team members gave Canada, China and France the responsibility of being Co-chairs.
- A three-year work plan was approved by the Committee on the Peaceful Uses of Outer Space (COPUOS) - 2002.

Action Team membership:

- Open to all States members of the U.N. – 40 States
- United Nations entities - 9
- Inter- and non-governmental entities - 4
- Private sector entities only as part of the national delegations

Key Findings

- Considerable global investment has been made in EO, communications, navigation and positioning systems that can be used for disaster management applications.
- There are some notable international efforts to promote the use of space-based information for disaster and natural resource management, for example:
 - **The International Charter “Space and Major Disasters”**
 - **Disaster Monitoring Constellation (DMC)**
 - **Integrated Global Observations Strategy (IGOS)**
 - **GMES**
 - **GEO**

Building synergies and avoiding duplication is essential
- Current use of **space operations** needs to be expanded to long term prevention and preparedness.

Considerations and Recommendations

- Disasters indiscriminately affect all parts of the globe; thus **coordinated international effort is required** to minimize their impact.
- **Disasters require timely and up-to-date situational analysis** in a cost effective way through the full cycle of reduction - mitigation – preparedness – response – recovery and linked to local geo-social and thematic databases.
- Currently there is some emphasis on disaster response but **too little on prevention and mitigation**.
- **Space technology** (EO, communications, positioning) **can provide the necessary information to help in disaster management**.
- **A more integrated and coordinated approach** to space-based disaster management **is needed** to reduce the gap in all areas of space technology application.

Recommendation 1

- **Establish an international space coordination entity for disaster management**, nominally identified as the 'Disaster Management International Space Coordination Organization' (DMISCO).
- **Through linkages with stakeholders**, DMISCO's perceived role:
 - Provide the necessary coordination to optimise the efficiency of services in support of DM by **fully utilizing the existing and planned space and ground-based assets and infrastructures (e.g. GEOSS)**, with the full participation of existing organizations and mechanisms, including DM authorities
 - Product and service delivery **standardization**
 - Data policy **harmonization**
 - Improved **access to EO data archives** and **database maintenance**
 - Technical support for **capacity building**
 - Education and training and capacity building services

Recommendation 2

- **Establish a fund to provide sustainable resource to support international disaster management efforts**, particularly in the developing world:
 - Development and relief organizations
 - Funding institutions
 - Resource management institutes
 - Insurance companies
 - End users

Recommendation 3

- **Encourage member states to allocate a portion of their disaster management/relief and environmental security funds to using space technologies and appoint single point of contact.**

Present situation

- **Final report was accepted by COPUOS June 2004 in Vienna.**
- **In its report to the UN General Assembly, COPUOS proposed actions to carry the recommendations made by AT-7 forward**
- **Proposed actions were endorsed by the General Assembly in 2004. As a result, a study has been conducted on the possibility of creating an international entity to provide coordination and the means of optimizing the effectiveness of space-based services for use in DM. The Office for Outer Space Affairs (OOSA) coordinated the organization of the work.**
- **Study to be presented to in February 2006 to the Scientific and Technical Subcommittee of COPUOS.**

Present situation (cont)

The study:

- **Defines the key functions of the entity**
- **Describes the benefits**
- **Defines the scope and nature of the entity**
- **Proposes an implementation plan** that includes the estimated cost of such entity and possible sources of funding
- **Was prepared by an ad hoc expert group** with experts provided by interested member States and relevant international organizations

The ad hoc expert group will meet in February 2006 during the session of the Scientific and Technical Subcommittee

Defining a Global Strategy for Developing Countries

5 Regional Workshops

- Latin America and the Caribbean – La Serena, Chile - 2000
- Africa – Addis Ababa, Ethiopia – 2002
- Asia and the Pacific – Bangkok, Thailand – 2002
- Europe – Poiana Brasov, Romania – 2003
- Western Asia – Riyadh, Saudi Arabia – 2004

International Wrap-Up

All regions – Munich, Germany – October 2004

Co-sponsored by OOSA, ESA, CEOS, DLR

Organized with ISDR, UNESCO

Inter Agency Meeting on Outer Space Activities

18-20 Jan., 2005 Paris, France

Hazard Areas (26 + 2)

- **Avalanches, Landslides, Flash floods and Mudflows**
- **Climate change and sea level changes**
- **Coastal management, marine systems (including mangroves and coral reefs) and coastal erosion**
- **Crop pests and plagues**
- **Cyclones, Tsunamis and Storm Surges**
- **Deforestation**
- **Desertification**
- **Drought**
- **Earthquakes**
- **Epidemiological and entomological risks**
- **Extreme weather conditions (temperatures, thunderstorms, snowstorms, windstorms, and lightning)**
- **Fires – Forest and grassland**
- **Floods**
- **Food security**
- **Glaciers**
- **Haze and Fog**
- **Land degradation and soil erosion**
- **Land mines**
- **Oil spills**
- **Refugee flows**
- **Sand and Dust storms**
- **Subsidence**
- **Technological, industrial and nuclear risks**
- **Transportation accidents**
- **Volcanoes**
- **Water pollution**
- **Capacity building**
- **Development of IT and space technology systems and solutions**

Inter Agency Meeting on Outer Space Activities

18-20 Jan., 2005 Paris, France

Munich Recommendations (1)

Capacity Development and Knowledge Building

The space technology community should reach out to understand specific needs of user community and develop end-to-end solutions that meet their requirements.

Space technologists have a responsibility to reach out and bring together all relevant players.

There is a need for continuous education on space capabilities (technical, institutional and decision-making levels) and development of national and regional expertise.

Munich Recommendations (2)

Data Access, Data Availability and Information Extraction

Limited or no mechanisms in place to make data rapidly available at all decision levels during disaster response; when data is available it is not always in a “user friendly” format.

Need to jointly develop standards for information extraction from remotely sensed data and disaster mapping procedures. This will foster better understanding and acceptance of space-based information by civil protection and disaster relief communities.

Munich Recommendations (3)

Enhancing Awareness

Create awareness among national and international stakeholders that space-based solutions reduce risk and vulnerability and are cost effective.

Disseminate lessons learned from the application of space-based technologies for the mitigation of hazards to the public, beginning with school children and including the scientific community and the media.

Institutions within each country that use space technology should take on the responsibility to periodically carry out activities that contribute to raising awareness such as promoting World Space Week (held 4-10 October annually).

Munich Recommendations (4)

National, Regional and Global Coordination

At the national level institutions within a country should be responsible for coming together to define actions to be carried out collectively.

Channelling of space technology for risk reduction and disaster management activities at the national and regional levels **should be carried out through a partnership of interested institutions and UN agencies**, to be registered in the context of the WCDR.

At the regional level, interested international, regional and national institutions should come together as a Regional Task Force to advance the actions that are relevant to the region as a whole.

At the global level, there is a need for a coordination entity to provide for the coordination and the means of optimising the effectiveness of space-based services for use in disaster management. This “Coordinating Entity” would be a one-stop shop for knowledge and information sharing (including best practices) and a platform to foster alliances of international initiatives. Each country should identify one National Focal Point, originating from the user community, who would be the primary link between the proposed Coordinating Entity and the national institutions.

The Munich Vision:

A Global Strategy for Improved Risk Reduction and Disaster Management Using Space Technologies

