**DISASTERS**

**Reducing loss of life and property from natural and human-induced disasters**

**DI-01 Informing Risk Management and Disaster Reduction**

Task implementation is supported by the Geohazards Community of Practice and Coastal Zone

Community of Practice

**Related GEOSS Strategic Targets** (*from GEO-VI Document 12 Rev1*)

*Disasters*:

Before 2015, GEO aims to enable the global coordination of observing and information systems to support all phases of the risk management cycle associated with hazards (mitigation and preparedness, early warning, response, and recovery).

***This will be achieved through:***

Development of multi-hazard and/or end-to-end approaches, as appropriate to meet the

needs for disaster risk reduction, preparedness and response in relevant hazard environments.

Moretimely dissemination of information from globally-coordinated systems for monitoring, predicting,

risk assessment, early warning, mitigating, and responding to hazards at local, national, regional, and

global levels.

Support to the successful implementation of the Hyogo Framework for Action 2005-2015.

**Description**

Improve disaster risk management and reduction by providing timely information relevant to the full

cycle of disaster management (mitigation, preparedness, warning, response and recovery). Adopt a

multi-hazard end-to-end approach to ensure that relevant Earth observations and information

effectively reach decision-makers and the public. Focus on three main areas: (1) Provide support to

operational systems and conduct gap analyses in order to identify missing data, system gaps, and capacity gaps.

; (2) Enable and inform risk and vulnerability analyses; and (3) Develop regional end to-

end systems with a focus on building institutional relationships.

**Components**

**C1 Disaster Management Systems**

*Leads*

China (BNU), European Commission (EC FP7), Nigeria (NASRDA), Spain (CSIC), United Kingdom

(GMI), United States (NASA), CEOS (CSA, guy.seguin@asc-csa.gc.ca) and ESA

*Priority Actions*

• Improve access to information produced through key disaster management mechanisms such as

the International Charter on Space and Major Disasters, Sentinel Asia, GMES Emergency

Management Services, and SERVIR

• Promote quick and easy access to in-situ data and reference maps required in case of emergency.

Integrate baseline geographic information and reference maps with real-time data from satellite or

in-situ platforms into online Graphical User Interface and Decision Support System tools

• Make information related to environmental risk and vulnerability easily accessible to a wide range

of decision-makers through a centralized platform. Build upon the South African Atlas (based on a

spatial database system and a repository of global-change related information) and the Chinese

disaster assessment system (based on Geographic Information Systems)

• Enhance the use of satellite data for disaster management, based on lessons-learned and

experience from countries and organizations, and develop best practice guidelines for technical

and procedural cooperation in satellite-based emergency mapping

• Review global and regional disaster risk management systems such as theWildland Fire Early Warning system, in view of developing an end to end approach. Perform a gap analysis considering

data, metadata, systems, and capacity to cover all phases and types of disasters. (building upon existing analyses)

**C2 Geohazards Monitoring, Alert, and Risk Assessment**

*Leads*

China (BNU, CAS, CEA), Germany (GFZ Potsdam), Italy (EUCENTRE, fabio.dellacqua@unipv.it),

Nigeria (NASRDA), CEOS (CSA, NASA) and ESA

*Priority Actions*

• Apply a fully integrated approach to geohazards monitoring, based on collaboration among

existing networks and international initiatives, using new instrumentation such as in-situ sensors,

and aggregating space (radar, optical imagery) and ground-based (subsurface) observations.

Develop open comprehensive natural-hazards datasets, initially focusing on selected targets (e.g.

Supersites)

Support the establishment of Supersites and Natural Laboratories. Provide an electronic

infrastructure allowing easy access to data (space & in-situ) and a wide range of tools, and a

platform for on-line collaboration. Develop a consolidated Supersites Strategic Plan (covering

space, ground, infrastructure meta-data, processing and data dissemination)

Enhance global earthquake and volcano monitoring, alert, and damage assessment. Improve the

global and regional coordination of seismographic networks. Enable rapid access to waveform and

space-borne (e.g. optical, radar) data for early warning, rapid shaking assessment and rapid

damage assessment

Support global earthquake risk assessment. Improve global standards and establish regional

programs for hazard and risk assessment in a global framework. Support the implementation of the

Global Earthquake Model initiative (GEM)

Develop large-area vulnerability modeling and mapping using novel algorithms and

methodologies based on Synthetic Aperture Radar (SAR) and optical satellite data

Support tsunami early warning and hazards assessment. Promote real-time data sharing in

particular seismic and sea-level (deep-ocean and tide-gauge data). Enable and develop a global

tsunami hazard map through provision of bathymetry and topography data. Build on existing

systems such as the German Indonesian Tsunami Early Warning System (GITEWS) and the

European Tsunami Alerting Device (TAD)

**C3 Regional End-to-End Systems**

*Leads*

Canada (CSA), CEOS (NASA, stuart.w.frye@nasa.gov) and CMO (CIMH)

*Priority Actions*

Implement regional and cross-cutting end-to-end projects. Develop natural-risk decision-support

tools and applications supporting the full cycle of disaster management, especially for developing

countries. Support the implementation of the GEO Caribbean Satellite Disaster Pilots and Sensor

Web applications in Namibia.

* Expand pilots to others types of disasters
* Develop a world wide scheme of regional end to end system and identify lead for each region in synergy with existing one such as sentinel Asia, GMES, etc.

Identify locations for tandem centers of excellence in developed and developing regions, and

initiate the formation of these centers

**To Be Implemented in Connection with**

SB-01 Oceans and Society: Blue Planet

SB-04 Global Urban Observation and Information

HE-01 Tools and Information for Health Decision Making

CL-01 Climate Information for Adaptation

WA-01 Integrated Water Information

WE-01 High-Impact Weather Prediction

AG-01 Global Agricultural Monitoring and Early Warning

All “Infrastructure” and “Institutions and Development” Tasks

**Resources Available for Implementation** (tentative)

ESA-funded review for improving access to the International Charter Space and Major Disasters

in Africa

In-kind contributions in support of the Supersites initiative from ESA, UNAVCO, USA

(University of Miami), and several space agencies

Caribbean Satellite Disaster Pilot and Namibia Flood project co-funded by Canada (CSA), USA

(NASA), and others

Related activities of the Chinese Academy of Disaster Reduction and Emergency Management

(http://adrem.org.cn/). GIS-based disaster assessment system covering earthquake, flood, landslide,

debris flow, forest fire, and tsunami

SERVIR regional visualization and monitoring system (http://www.servir.net) supported by USA

(NASA, USAID)

EC (GMES) Emergency Management Service (www.emergencyresponse.eu/gmes/en/ref/home.html)

Sentinel Asia Geographic Information System catalogue maintained by Japan (JAXA)

(https://sentinel.tksc.jaxa.jp/sentinel2/topControl.action)

Satellite constellations committed to provide data through the International Charter in case of

major disasters

International Charter Space metadata catalogue maintained by France (CNES)

(http://www.disasterschartercatalog.org)

South African Risk and Vulnerability Atlas (SARVA) (http://www.rvatlas.org)

Supersites Web Portal (http://supersites.earthobservations.org) including ESA’s Virtual Archive

cloud infrastructure

Global Seismographic Network (GSN; http://www.iris.edu/hq/programs/gsn)

Global Earthquake Model (GEM) facility (http://www.globalquakemodel.org/model-facility),

including the GEM’s risk assessment platform (OpenGEM) and the OpenQuake software

Sensor network of German Indonesian Tsunami Early Warning System, including ocean bottom

units, buoys and tide gauges

Global Fire Danger Forecast Web Portal (www.fire.uni-freiburg.de/gwfews/forecast\_ews.html)

Global Fire Information Management System (GFIMS, http://www.fao.org/nr/gfims/gf-home/en/)

Caribbean regional platform for sharing geospatial data and maps relevant to atmospheric risk,

supported by Italy (CIMH)

Namibia flood sensor-web portal (http://geobpms.geobliki.com/namibia)

Global Volcano Model (GVM) (http://www.globalvolcanomodel.org