Space in Support of Disaster Management – Where do we stand?

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Space for Disaster management is a young discipline

- From military applications, espionage, telecommunication, environmental monitoring, navigation to safety and security of people

- Disaster management is often a local/regional in scale and fast response tasks, where civilian satellite systems were useless for long time

- Today, space systems support
  - disaster management
  - humanitarian relief
  - Mitigation of threats to society
Earth Observation, Communication and Navigation

- **SatCom (voice/data) mature**, tricky to handle, limited bandwidth - off the shelf solutions exist and are applied widely


- **Earth Observation (EO) programmes dominate**, as EO takes more value adding to be applied

- **Push for integration** of EO/NAV/COM services => more coherence (ESA/EU)
  - Is it possible to integrate?
  - Do we have to integrate?

- **Different service types**
  - NAV/COM is individual / peer to peer
  - EO is “multilateral”: one image/map may serve different purposes or user groups
Spaced Assets can contribute to all phases of the disaster cycle

- Preparation/Prevention
- Risk Analysis
- Alertness
- Reconstruction
- Emergency Relief
- Transition Phase
- Relief & Reconstruction
Space and disaster management experiences a boom

Many programmes/initiatives:
- UN, International, Regional (Asia, Caribbean, EU,…), National
- CEOS-DMSG, UNISPACE Meetings, Int. Charter Space and Major Disasters, UN-SPIDER, GMES/Kopernikus, GEO/GEOSS, Sentinel Asia, Servir, …

A large window of opportunity

High responsibility for all actors
- To act coherently
- To convince, but not oversell
- To serve the user needs and not just promote the use of space assets and systems
Space Technology Push

- The push is large, and is even getting larger - good and dangerous at the same time
- Users are not (yet?) customers!
- Earth Observation: Sponsor – Provider – User
- NAV/COM: used more directly and commercially
User “Issues”

- 90% of the disasters are handled locally or regionally. This requires local to regional capacities and solutions.

- Data and information residing with UN, are not necessarily available at the local government/disaster management authorities.

- Users don’t like maps which are wrong, too few, too many or too late – customers would tell right away.

- Need to move from “users” to “stakeholders” and “customers”

- Of course blankets are more important then satellite imagery…
Tsunami 2004 – What have we learned?

- Three Charter activations, probably many more calls
- Many people started out in parallel
- After a few days at least in Europe we managed to sort the base mapping job out
- Many mapping activities to follow, building on the first basis mappings at all scales
- Maps were printed in hundreds and distributed by various actors locally

=> divide task, standardize analysis, cross-check results
China Earthquake May 2008

- Very fast provision of satellite imagery of all kinds, Charter data and beyond

- Analysis to large extent as centrally coordinated work

- Main mapping was procured in China with local to very local scale

- SAR data proved to be very difficult to interpret (COSMO/TerraSAR-X) due to missing archive data and the radar properties

=> AOIs were communicated fast, data was provided very informally, processing capacities were at hand nationally, supported by different international actors
Haiti September 2008

- Three different Charter calls => joint to one activation
- Many different actors, data sets and maps
- Some coordination via UN, some nationally
- Beneficiaries (UN, EU, National International Relief activities, local government?)
- “Some one send us a maps, we need more of this” => need more coordination who does what for whom, where, when and how?
- => Better coordination tools, how can create better synergy and coherence of different mapping products?
From concepts to operational and coordinated doing

1990+: Concepts
- IDNDR, CEOS DMSG, UNISPACE Meetings, national initiatives, etc.

2000+: Doing
- High resolution optical and radar made a difference.
- More satellite systems available
- Charter: A big success! First time we got something moving!

2010+: Coordination
- A map the diversity of space activates in support of disaster relief
- To better network what is available => brokerage of action, data and information
- Reliefweb of Space: Virtual Coordination Centre of Space Assets
Standards, quality and accountability

> **Approved emergency mapping standards:**

  > Standard procedures, methods
  > Nomenclature, legends, languages, etc.

> **Quality:**

  > People have to be able to blindly rely on results
  > Results have to be comparable when produced by different providers
  > universal quality, validation and benchmarking procedures

> **Reliability and liability:**

  > Operational mandates and institutions
  > Move from best effort to accountable services
What is going in Europe these days

- **Kopernikus** the EU program formerly known as GMES
- We’ll see a transition from GSEs to Fast track services (Emergency and Security)
- **Respond, RiskEos, Preview** => **SAFER** Fast track emergency Response (mapping, benchmarking and European standards)
- **GMOSS, LIMES** => **G-MOSAIC** (Civilian Security Issues)
- Core and Downstream Services
- **Kopernikus** - Operational budget lines 2013
- **Preoperational now**: Supporting the Implementation of ER – user federation and technical interfaces
What is going on at DLR / ZKI

- TerraSAR-X service improvements in the domain of disaster mitigation
- DLR not yet a member of the Charter – this is under preparation
- DLR upgrades operation and procedures its Centre for Satellite Based Crisis Information (ZKI) continuously
- Trainings and Exercises with users and providers (GNEX, AMC, Respond, Limes)
- Preparation of the EC Kopernikus Fast Track Service Emergency Response „SAFER“, where DLR/ZKI was mandated the role of Rapid Mapping Coordinator
Summary and Conclusion

- **Space assets can significantly contribute** to many elements of disaster management operations

- **EO has to enter the public domain for disaster relief**, just as COM and NAV already have

- **Integration of EO, NAV and COM** should be achieved for field applications

- “Users” need to become “customers” and “stakeholders”

- **A Relief-Web and a Virtual Coordination Centre of space assets** should be built as a map of the diversity as well as a guide to quality and reliability of space for disaster mitigation

- We need to **establish and agree**
  - Commonly applied standards
  - Universal quality, validation and benchmarking procedures

- We need to move **from ”best effort” to reliable operations**

- Let’s discuss, but also move things forward together!