MOBILISE PROJECT LAUNCH REPORT

Creating a Multi-Agency Collaboration Platform for Building Resilient Communities (MOBILISE) in Sri Lanka, Malaysia and Pakistan
Launch Event: 21 and 22 August 2017

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M5 4WT, UK
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1. INTRODUCTION

This report summarises the outcomes from the MOBILISE project launch event which took place at MediaCityUK in Salford (UK) on the 21st August 2017 and from the technical workshop which took place on the 22nd August 2017 in the THINKlab at the University of Salford. The list of participants who attended the events can be found in Appendix 7.3.

2. BACKGROUND

The THINKlab at the University of Salford received research funding (£1.2m) from the Global Challenge Research Fund (GCRF) and the Engineering and Physical Sciences Research Council (EPSRC) to develop a Collaborative Multi-Agency Platform that can be used for building resilient communities in disaster-prone areas in the Low and Middle Income Countries (LMICs). The project entitled “A Collaborative Multi-agency Platform for Building Resilient Communities (MOBILISE)” focuses on disaster risk reduction and the development challenges faced by three low- and middle-income countries, namely, Malaysia, Pakistan and Sri Lanka.

The key academic and industry partners within the project are:
1. THINKlab, University of Salford, United Kingdom
2. The Centre for Disaster Resilience, University of Salford, United Kingdom
3. The Department of Sociology, University of Colombo, Sri Lanka
4. The Department of Civil Engineering, University of Moratuwa, Sri Lanka
5. Disaster Management Centre, Ministry of Disaster Management, Sri Lanka
6. KANZU Research Centre, Universiti Tun Hussein Onn Malaysia, Malaysia
7. The Centre for Disaster Preparedness and Management, University of Peshawar, Pakistan
8. The Civil Contingencies Secretariat, United Kingdom
9. The Civil Contingency and Resilience Unit, Greater Manchester, United Kingdom
10. The Rockefeller Foundation – 100 Resilient Cities
11. The Environment Agency, United Kingdom
12. Secure Information Assurance Ltd, United Kingdom
13. Satellite Applications Catapult Ltd, United Kingdom
14. Telespazio Vega Ltd, United Kingdom
15. Asian Disaster Preparedness Center (ADPC), Thailand
17. The Centre of Governance Innovations, Sri Lanka
18. National Disaster Management Agency, Malaysia
19. Melaka Historical City Council, Malaysia
20. The Construction Research Institute of Malaysia, Malaysia
21. Khyber Pakhtunkhwa Provincial Disaster Management Authority, Pakistan
22. Jehanghira Union Council, Pakistan
23. Nowshera Rural Development Foundation, Pakistan
24. Inaratech, Pakistan
3. AIMS AND OBJECTIVES OF THE MOBILISE RESEARCH PROJECT

MOBILISE uses digital technology to create a collaborative environment to enable various agencies (responsible for managing localised disaster) and communities to act collectively to reduce the impact of disasters. The main objectives of this project are to:

- Promote South–South multi-agency disaster risk and emergency governance collaboration through advanced digital technologies.
- Create a web–based collaboration platform for supporting collective vulnerability assessment, mitigation and resilience.
- Develop system dynamics for modelling the cascading effects of disasters involving ambulance, police and fire services.
- Develop a web-based platform for gathering instantaneous intelligence of a disaster through remote sensing and social media.
- Construct virtual disaster events using real-time Earth Observation / Satellite data for planning future disaster responses.

The end goal of the MOBILISE project is to develop an advanced digital platform that aids risk and resilience governance capabilities linked to the priority number two (strengthening disaster risk governance to manage disaster risk) of the Sendai Framework for Disaster Risk Reduction (2015–2030) in partnership with government agencies, non-government agencies and industries based in the United Kingdom.
## 4. PROGRAMME

### Day One:
**Venue:** University of Salford Campus, MediaCityUK, Salford Quays. 
**Rooms 3.07 & 3.08**  
**Date:** 21st August 2017

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>9.00am</td>
<td>Coffee &amp; Arrival</td>
</tr>
<tr>
<td>9.30am</td>
<td>Welcome (Prof. Karl Dayson, Dean of Research)</td>
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<tr>
<td>9.40am</td>
<td>Introduction to the MOBILISE project (Terrence Fernando, Director of the THINKlab)</td>
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<tr>
<td>10.10am</td>
<td>UK Approach for Managing Disaster Resilience (Luana Avagliano, Resilience Direct, Cabinet Office)</td>
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<tr>
<td>10.40am</td>
<td>Multi-agency approach for Creating Resilience City: Manchester Approach (Kathy Oldham, Head of Civil Contingencies and Resilience Unit, Greater Manchester)</td>
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<tr>
<td>11.10am</td>
<td>Interactive Demonstration of Collaborative Virtual Emergency Response Training Platform and Coffee Break</td>
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</tbody>
</table>
| 11.30am| Introduction to UK Steering Committee:  
- Satellite Application Catapult  
- Telespazio  
- Secure AI / UK Fast  
- Environment Agency |
| 11.50am| Challenges in developing disaster resilience through multi-agency collaboration:  
Sri Lankan Perspective: Siri Hettige, Hemanthi Goonasekera, Rankotge Srim Priyantha Samansiri and Chandana Siritwardana. |
| 12.20pm| Challenges in developing disaster resilience through multi-agency collaboration:  
Malaysian Perspective: Norah Sulaiman and Weishe Teo. |
| 12.50pm| Challenges in developing disaster resilience through multi-agency collaboration:  
Pakistan Perspective: Mohammed Khalid and Mustaq Ahmad Jan |
| 1.20pm | Discussion & Final Remarks                                           |
| 1.30pm | Lunch & Networking (Interactive Demonstration of Collaborative Virtual Emergency Response Training Platform) |
| 2.30 pm | Partner Introduction (Sri Lanka, Pakistan, Malaysia)                 |
| 3.15 pm | Technical Work package description and partner roles (Prof. Terrence Fernando) |
| 5.00 pm | Close                                                                |
| 7.30 pm | Dinner                                                               |
### Day Two:
**Venue:** THINKlab visit and MOBILISE Technical Workshop  
THINKlab, Room 712 (Level 7), Maxwell Building, University of Salford  
**Date:** 22nd August 2017

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<tr>
<th>Time</th>
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<tr>
<td>9.00am</td>
<td>Coffee &amp; Arrival</td>
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<tr>
<td>9.30am</td>
<td>Welcome (THINKlab, Terrence Fernando)</td>
</tr>
<tr>
<td>9.35am</td>
<td>Resilience Frameworks &amp; System Dynamics</td>
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<tr>
<td></td>
<td>- Different Resilience Framework (Centre for Disaster Resilience, Chaminda Pathirage &amp; Komal Aryal)</td>
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<td></td>
<td>- System Dynamics (THINKlab, Hisham Tariq)</td>
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<tr>
<td>10.25am</td>
<td>Modelling Vulnerability &amp; Crowd sourcing</td>
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<td></td>
<td>- City Data Explorer (THINKlab, Terrence Fernando)</td>
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<td></td>
<td>- Crowd Sourcing (THINKlab, Shamaila Iram)</td>
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<tr>
<td>11.15am</td>
<td>Coffee Break</td>
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<tr>
<td>11.30am</td>
<td>Demonstration of the concept of near real-time disaster visualisation environment (THINKlab Team)</td>
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<tr>
<td>12.00 pm</td>
<td>Satellite technologies for disaster response</td>
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<td></td>
<td>- Advances in Satellite Technology: Daniel Wicks and Elena Lobo, Satellite Application Centre.</td>
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<tr>
<td></td>
<td>- Use of Satellite Technologies for Monitoring &amp; Disaster Response: Thomas Beaton, Telespazio.</td>
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<tr>
<td>1.10pm</td>
<td>Lunch &amp; Networking</td>
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<tr>
<td>2.00pm</td>
<td>Existing Technology capabilities for disaster management in partner countries</td>
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<tr>
<td></td>
<td>- Sri Lanka Position: Srimal Samansiri, Disaster Management Centre</td>
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<td></td>
<td>- Pakistan Team Position: Noor Jehan, Centre for Disaster Preparedness and Management, University of Peshawar.</td>
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<td>- Malaysian Team Position: Mohd Ariff Bin Baharom, National Disaster Management Agency (NADMA)</td>
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<td>- Asian Disaster Preparedness Center Position: Senaka Basnayaka</td>
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<td></td>
<td>- New Zealand Experience: A Case Study from OPUS International: Jonathan Hill, Opus International</td>
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<tr>
<td>4.30 pm</td>
<td>Close</td>
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5. PROJECT LAUNCH EVENT

On the occasion of World Humanitarian Day 2017 (21 August 2017), the THINKlab at the University of Salford launched a project funded by the GCRF and EPSRC. The workshop opened with an address by Prof. Karl Dayson, Dean of Research at the University of Salford, who officially welcomed the dignitaries and participants (photo 1). Prof. Dayson started his remarks by thanking the EPSRC, GCRF and the government of the United Kingdom. He introduced the University of Salford’s research-led, industries-centred teaching strategies and its commitment to reducing local and global disaster impacts through the University’s research centres such as the THINKlab and the Centre for Disaster Resilience (CDR). Prof. Dayson assured full support of the MOBILISE project from the executive team of the University of Salford.

Following the welcome speech by Prof. Dayson, the Director of the THINKlab and Principal Investigator of the MOBILISE project Prof. Terrence Fernando began his presentation by sharing the overall disaster-risk governance challenges within Asia and the Pacific region. Professor Fernando spoke on the activities that had been carried out by the THINKlab over the past ten years and presented the MOBILISE project concept.

Prof. Fernando highlighted that, in recent years, every government (particularly in the LMICs) has had to cope with the effects of a substantial number of disaster incidents exposing the vulnerability of their populations. Prof. Fernando further shared that disasters (including those caused by climate change) can affect a population in two ways: slow onset impacts (drought, prolonged wet periods); and sudden, rapid impacts (typhoons, floods, heavy snow, long dry or wet spells, glacial lake overflow, landslides). Often, the sudden and rapid impacts of disaster will come without warning leaving the population with little or no time to react. Prof. Fernando emphasised that experience of previous incidents has shown that such events are rarely straightforward and often leave victims in a vulnerable state. He further highlighted that government departments at all levels are then faced with complex situations. Prof. Fernando presented details on the MOBILISE project plans to develop
digital infrastructures capabilities to facilitate multi-agency collaboration to strengthen local risk governance in Malaysia, Pakistan and Sri Lanka.

The first special guest speaker Ms. Luana Avagliano (Head of Resilience Direct, Civil Contingency Secretariat, Cabinet Office, United Kingdom) shared information on disaster risk governance at the national level in the United Kingdom (photo 2). During her presentation, Ms. Avagliano provided detailed information on how multi-agency collaboration works in the UK to reduce disaster risk and strengthen disaster resilience.

In a similar vein, Dr. Kathy Oldham (Head, Civil Contingencies and Resilience Unit of Greater Manchester Authority) presented on how local risk and resilience is governed at the sub-regional and local level in the UK (photo 3). Dr Oldham also shared information on the activities she is conducting as part of her work with the Rockefeller Foundation funded “100 Resilient Cities” programme and the United Nations Office for Disaster Risk Reduction (UNISDR) coordinated “Making Cities Resilient Campaign”.

Following the keynote presentations from Ms. Avagliano and Dr. Oldham, the project partners from the UK, namely, Mr. Nick Mercer (Team Leader, Environment Agency), Mr. Martin Knapp, (Managing Director, Secure Information Assurance Ltd), Mr. Daniel Wicks (Senior Earth Observation Specialist & Cities Lead Satellite Applications Catapult Ltd), Dr. Elena Lobo (Senior Space Innovation Facilitator at Satellite Applications Catapult) and Thomas Beaton (Senior Earth Observation Engineer, Telespazio Vega Ltd) presented their core areas of expertise and how they plan to support the MOBILISE project.
Subsequently, the project partners from Sri Lanka, Malaysia and Pakistan presented on the challenges in developing disaster resilience through multi-agency collaboration in their respective countries. These presentations were followed by lunch.

5.1 Interactive Demonstration on the Collaborative Virtual Emergency Response Training Platform

During the lunch break, attendees were given an opportunity to interact with a Collaborative Virtual Emergency Response Training Platform (prototype) developed by the THINKlab (photo 4). Dr. Simon Campion and Michal Cieciura from the THINKlab presented the basic concepts of the prototype to the attendees.

5.2 MOBILISE Project Management Meeting

The project meeting was chaired by Prof. Terrence Fernando (photo 5). In his opening address Prof. Fernando briefed all present on the main aims and objectives of the workshop and presented the project’s governance structures, the project’s work packages and the year one activities’ schedule. Prof. Fernando shared the expected outcomes and out-puts of the project. Prof. Fernando then handed over to the project finance representatives from the University of Salford to brief the project team on the rules and regulations of the Global Challenge Research Fund GCRF and EPSRC.
Subsequently, each participant was then given the opportunity to introduce him/her and their organisation. This was followed by an open discussion on how best to strengthen project activities by linking with influential stakeholders in each country.

**Follow up activities:**

The participants agreed on Prof. Fernando’s two proposals, which were:

1. The MOBILISE project team will have Skype meeting at 09:00 (GMT) on the first Monday of every month from October 2017 till August 2020.
2. The project website will be launched by the end of September 2017.

A conference dinner was hosted by the THINKlab providing further opportunities to get for the project partners to get to know each other more closely.

6. MOBILISE TECHNICAL WORKSHOP

The technical workshop (22 August 2017) was hosted at the THINKlab. At the beginning of the workshop Prof. Fernando revisited day one’s activities and introduced the day two’s programme. The first half of day two featured a series of presentations aligned to the project work packages and covered the theoretical definitions of hazards, risks, vulnerability, system dynamics, and the use of earth observation-based technologies for monitoring, analysing and managing disasters and emergencies. Dr. Chaminda Pathirage and Dr. Komal Aryal presented Disaster Risk and Resilience Governance and Mr. Hisham Tariq presented the potential of system dynamics for modelling resilience. Following the presentation Dr. Shamaila Iram shared her work on crowd sourcing for disaster responses. Prof. Fernando introduced activities carried out by the City Data Explorer. His presentation reported on a study undertaken by the THINKlab which was looking at city data management in the UK.

After the coffee break, Prof. Fernando and Dr. Arturo García Jiménez gave a demonstration on the concept of a near real-time disaster visualisation environment to the participants. This was followed by a presentation from Mr. Thomas Beaton (Senior Earth Observation Engineer, Telespazio) on the “Use of Satellite Technologies for Monitoring and Responding to Disasters”. His presentation gave a few examples of how Earth Observations can be used to monitor and reduce geo-disasters. Subsequently, Mr. Daniel Wicks (Senior Earth Observation Specialist) and Dr. Elena Lobo (Senior Space Innovation Facilitator) from the
Satellite Applications Catapult jointly shared information on advances in satellite technology and Satellite Applications Catapult’s international work.

After lunch, a series of presentations were delivered by the overseas partners. Dr. Senaka Basnayake (Director – Climate Resilience, Asian Disaster Preparedness Center, Thailand) gave a comparative presentation highlighting the key achievements and experiences of the ADPC on “Digital technology for disaster risk management in Asia” including best practice approaches and lessons learnt from Asian countries. Dr. Basnayake shared the following project activities in his presentation:

- End-to-End Early Warning Systems for Cyclones, Storm Surges and Floods in Bangladesh, Vietnam, China and Lao PDR
- Connecting Space to Villages in the Lower Mekong Region (SERVIR-Mekong)
- Drought Susceptibility Mapping in Nepal
- Myanmar Disaster Risk Decision Support System (DSS)
- Sri Lanka early warning activities funded by the UNESCAP Trust Fund for Tsunami (TTF)
- City-level hazard, vulnerability and risk assessment in Lao PDR
- Regional Drought and Crop Yield Information System (RDCYIS)
- Rakhine State Disaster Early Warning and Shelter Information Portal

Mr. Srimal Samansiri (Assistant Director, Research and Development, Disaster Management Centre, Sri Lanka) delivered a detailed presentation that focused on the use of geoinformatics in Sri Lanka. He introduced the disaster management approach in Sri Lanka and identified the current issues and future challenges based on past and current disaster risk assessment projects in the country.

Prof. Noor Jehan (Centre for Disaster Preparedness and Management, University of Peshawar) highlighted disaster management technical capabilities in Pakistan with the example of an Integrated Flood Analysis System (IFAS).

Mr. Mohd Ariff Bin Baharom (Deputy Director General, Planning and Policy Sector) shared the chronology of disaster events in Malaysia and the key challenges faced by the National Disaster Management Agency (NaDMA) in the context of using modern technologies to deal with disaster risks at local and national levels. Mr. Baharom gave a presentation entitled “Technology capabilities toward disaster risk reduction in Malaysia” and discussed the
National Flood Forecasting Centre and Forest Monitoring activities and the lessons learnt from recent flooding events in Malaysia. During the presentation, Mr. Baharom also shared information on the activities of the Forest Monitoring System using Remote Sensing (FMRS) developed by the Malaysian Remote Sensing Agency (MRSA).

Mr. Jon Hill (OPUS International) spoke on what happens to critical infrastructure during an emergency and stressed how important it is to monitor such infrastructures for the business continuity. Sharing the example of SMART (Seismic Monitoring Assessment Tool) to provide rapid asset assessment following significant seismic events in the years 2010, 2015 and 2016 in New Zealand, Mr. Hill highlighted how effectively OPUS’s assessment tool, SMART, enabled owners to make quick decisions on the continued use of a building. He also briefly shared how OPUS is using sensor-based technologies to monitor bridges in remote locations.

At the end of the workshop, Prof. Fernando thanked all the project partners and the industry collaborators for their contribution and time.
7. LIST OF APPENDICES

Appendix 7.1: Photos

Appendix 7.2: Key Conference Presentations

Appendix 7.3: List of Participants
Appendix 7.1: Photos

7, 8, 10, 11 and 12 – Presentations during the workshop and the opening session
9- MOBILISE Project Management Meeting
12 – The Technical workshop
Participants interacting with the Virtual Reality Platform developed by the THINKlab

Networking
Appendix 7.2: Key Conference Presentations

ResilienceDirect

Luana Avagliano,
Head of ResilienceDirect

@RD_GOV #ResilienceDirect

ResilienceDirect

Westminster Bridge

@RD_GOV #ResilienceDirect
Grenfell Tower

@RD_GOV #ResilienceDirect

Resilience Direct

Your Resilience Platform

Device neutral access from any location. Planning & response
Collaborative tool and
Mapping provides situational awareness for informing strategic decisions

Alerting and Notification

@RD_GOV #ResilienceDirect
Information Sharing - Key to Resilience

- ResilienceDirect enables the Resilience Community to share information across organisational and geographical boundaries, quickly and securely.

- **How would I use ResilienceDirect in Planning**
  - Document Store to share minutes and plans
  - Online Calendar for meeting and exercise dates
  - UK wide contact directory for users and groups
  - Online profiles for all users

- **How can I use ResilienceDirect in Response**
  - Response template
  - Share real-time information across the responding organisations
  - Collate Situation Reports and Actions
  - Utilise the notification function

@RD_GOV  #ResilienceDirect
Joint Emergency Services Principles (JESIP)

ResilienceDirect – A Common Platform for Shared Situational Awareness

**JESIP Joint Doctrine**

1.4.2 The precise form of a Common Platform will reflect local requirements and existing capabilities, but users are referred to ResilienceDirect for a widely-used and secure platform with a range of functions that support joint working.

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Mapping

ResilienceDirect enables the Resilience Community to access Ordnance Survey basemaps and overlay their local data. In addition, they can utilise the drawing tools provided within the application.

**How would I use Mapping in Planning?**
- Overlay your own data
- Provide accurate exports for your plans
- Define management zones

**How would I use Mapping in Response?**
- Create a response map
- Use the drawing tools to define cordons, control points and access routes
- Overlay local data to inform the TCG/SCG
STAY STRONG BECAUSE WINTER IS COMING

@RD_GOV #ResilienceDirect
Creating a Resilient City: Greater Manchester

Dr Kathy Oldham OBE
Chief Resilience Officer

Contents

- Building urban resilience
- Building political leadership
- Capitalising on technology

... three global challenges suggested UN ESCAP

... as addressed in Greater Manchester through multi-agency partnerships
The Greater Manchester economy in context

2.7m people 1.14m jobs 93,000 businesses

Source: ONS

Source: ONS, GVA estimates 2012

GM ECONOMY, 2011 £48.2bn
WALES ECONOMY, 2011 £47.3bn
NORTH EAST ECONOMY, 2011 £41.6bn
NORTHERN IRELAND ECONOMY, 2011 £29.9bn

GREATER MANCHESTER PREPARED
GDP@Risk by threat type

<table>
<thead>
<tr>
<th>Threat</th>
<th>GDP @ Risk</th>
<th>Share of Total GDP @ Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market crash</td>
<td>$1.54bn</td>
<td>28.67%</td>
</tr>
<tr>
<td>Flood</td>
<td>$1.06bn</td>
<td>19.77%</td>
</tr>
<tr>
<td>Oil price shock</td>
<td>$0.96bn</td>
<td>17.93%</td>
</tr>
<tr>
<td>Cyber attack</td>
<td>$0.86bn</td>
<td>16.06%</td>
</tr>
<tr>
<td>Human pandemic</td>
<td>$0.51bn</td>
<td>9.56%</td>
</tr>
<tr>
<td>Solar storm</td>
<td>$0.14bn</td>
<td>2.58%</td>
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Lloyds City Risk Register

www.Lloyds.com/cityriskindex
Urban Resilience

Resilience is not new

- Booming cotton industry in 1800s
- Large scale de-industrialisation from 1960s
- 1980s onwards – growth, reform and regeneration
- Multiple sectors including financial, sports, digital, manufacturing
- Current opportunities through Devolution & Northern Powerhouse
GM has a long heritage and clear identity ....

"...It’s got everything except a beach”
Ian Brown, lead singer, The Stone Roses

Birthplace of the Computer. Based on the work of mathematician and cryptographer
Alan Turing

"The area has witnessed a great many stirring episodes, especially of a political character. Generally speaking, its citizens have been liberal in their sentiments, defenders of free speech and liberty of opinion”
Emmeline Pankhurst, British political activist

Birthplace of Robert Peel, founder of the 1st professional public Police Force in the world

"...They do things differently here”
Tony Wilson

"...the belly and guts of the Nation”
George Orwell

"the capital, in every sense, of the North of England, where the modern world was born. The people know their geography is without equal. Their history is their response to it”
Brian Redhead 20th century broadcaster and social commentator

Manchester and its towns became the largest and most productive cotton spinning centre in the world in 1871, 32% of global cotton production

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Operation Newtown

Emergency Planning

The Council has a statutory responsibility under the Civil Contingencies Act 2004 to:

- Conduct regular assessments of c. 65 risks ranging from flooding to cyber resilience and Anti-Microbial Resistance
- Develop generic and specific plans, policies and procedures for identified risks
- Promote community resilience
- Deliver training and exercising
- To maintain sufficient capacity and capabilities to respond to the common consequences of major incidents
Making Cities Disaster Resilient

Supporting 3630 cities globally

Covering 700 Million People
73 Capital Cities
100 Cities w/ Million Pop
98 Countries

Enabling Essentials

Essential 1: Strengthen institutional capacity for evidence
Essential 2: Strengthen implementation capacity for evidence

Operational Essentials

Essential 4: Integrate disaster risk into ongoing development and planning
Essential 5: Strengthen institutional capacity for evidence

Build back Better Essentials

Essential 8: Ensure effective preparedness and disaster response

TEN Essentials for Making Cities Resilient

- operational framework built on Sendai Framework for cities
- supported by a multi-layered reporting tool
- developed for Mayors, city managers and planners to develop and implement urban resilience strategies
- plan future investments and track progress
- generates feedback to national governments
- developed by 40 global partners
- basis for insurers to assess level of risk
Benefits of joining the Making Cities Resilient Campaign

- Political ownership: 10 political leaders have signed up to the Campaign
- Visibility of the Disaster Risk Reduction agenda
- Influence: nationally, internationally
- Broader understanding of resilience: completion of LGSAT
- Opportunities to learn from others
- Opportunities to share Greater Manchester’s story
Global to local

CREAM Project, Stockport
Training and Community Safety Facility, Bury
Community Flood Preparation, Salford

Resilient Greater Manchester
City resilience has 4 key dimensions

100RESILIENT CITIES

100RC provides cities 4 types of support to address these problems

1. Funding to hire a Chief Resilience Officer (CRO)
2. Support to Develop a City Resilience Strategy
3. A Platform of Services to support strategy implementation
4. Membership in the 100RC Network
Benefits of joining 100RC

• Political ownership: GM Mayor as our resilience champion
• Resilience in a much broader context with a wide cross-sectoral reach
• International networking and learning
• Support for a comprehensive strategy, underpinned by an evidence base and citizen perceptions
• Opportunity to innovate and leverage new resources into Greater Manchester

Building on existing work

• Resilience strategy: based on completion of Disaster Resilience Scorecard
• Development of international city-to-city peer review tool
WHY IS A DRR STRATEGY IMPORTANT?

LOCALITY  international policy translating into local action on the ground

VISION  agreed collective goals amongst stakeholders with different priorities

TIMING  speaking to moments of transition and transformation

SUSTAINABILITY  continued focus through measuring progress

HOW
DO WE MEASURE SUCCESS?

Review risks (track exposure & vulnerability)
Regulatory inspections and investigations
Debriefs of incidents and exercises
Dialogue with the community
Democratic accountability
Self assessment & audits
Peer reviews
Political Leadership

A moment in history

• Greater Manchester: a devolved city region
• Reshaping services
• Local decisions made by local people to reflect local needs and opportunities

... resilience can be at the heart of this
Origins of devolution

- UK is the most centralised country in Western Europe
- MIER (Manchester Independent Economic Review) confirms the economic case for devolution in 2009
- The Localism Act allows for the creation of combined authorities (CA), pooling resources and working across a region
- In 2011, the GMCA is created – the first combined authority

Why Greater Manchester?

History
- Close collaboration in the form of AGMA
- Strong economic geography (in comparison to other regions)
- Strong interconnectivity through regional bodies – GMFRS, GMPTE etc.
- Strong civic leadership
Greater Manchester’s governance is a story of partnership

2 cities and 8 districts working in collaboration

Partnership governance
- Local Enterprise Partnership (business/private sector)
- Infrastructure Advisory Group (public/private sector)

Making a difference on the ground
- Resilience Development Group
- Local Health Resilience Partnership
- Chief Officers Group
GM’s resilience partnership

Public sector
- Emergency services
- Local government
- Specialist agencies (e.g. environment agency, Met Office)
- Military

Private sector
- Energy providers
- Water suppliers
- Transport sector

Academic
- University of Manchester
- University of Salford
- Manchester Metropolitan University

Voluntary sector
- British Red Cross
- Salvation Army
- Save The Children
- ... and many others

Collaboration in Adversity

- The Manchester Arena Attack
  - Media focus on the Mayor
  - Additional capacity
    - GM Civil Contingencies Unit
    - CA comms function
  - Agile political decision making
  - Strategic coordinating group and command structures
  - Commissioning services
  - Community Recovery Group
    - Immediate Tensions/Hate Crime Monitoring
    - Commission on Counter Extremism and Cohesion
Resilience as a cross cutting theme

- Greater Manchester Strategy
- Greater Manchester Spatial Framework
- Independent Review into preparedness for and response to Manchester Arena Attack
- Commission reviewing approaches to community cohesion
- Tower block task force
- Digital summit
- Green summit

... all require political leadership
REFLECTIONS ON GOVERNANCE

- an evolving, iterative process
- importance of political ownership
- horizontal connection to shape and influence cross-cutting themes
- vertical connection to enable traction on the ground whilst also linking to national mechanisms.
- ensuring resilience is not delivered as a ‘top-down’ approach but through a network of interconnected activity at various spatial levels
- fostering ownership and participation across sectors
- need to retain a specific focus on DRR whilst also ensuring DRR is everyone’s business

Capitalising on Technology
Partners benefit, single agency ownership

Reflections for MOBILISE

- Partnership is at the heart of preparedness, response, recovery and city resilience
- The city as a system of systems helps understand resilience but solutions tend to apply to one system or part acting independently
- Collaboration vs integration
- Risks as causes vs generic consequences
Kathy Oldham: k.oldham@manchester.gov.uk
@GM_prepared
www.gmemergencyplanning.org.uk
Reconstructing 3D Environments in Near-Real time with Satellite Data

Thomas Beaton
Senior Earth Observation Engineer
21/08/2017

TELESPAZIO
a LEONARDO and THALES company

Company Overview

A major ‘space company’ with more than 40 years heritage
- Space communications
- Space control operations services
- Space EO and GNSS consultancy studies
- Geospatial Information Services

UK footprint
- Located within Leonardo facility at Luton
- 150 staff
- £35 mill annual turnover
Networks & Connectivity
- E.g. Fixed & Mobile satellite broadband and Oil & Gas and Maritime telecommunication

Satellite System Design and Integration
- Ground Segment design, development & implementation and Launch Services

Satellite Operations
- E.g. In orbit control of satellites and constellations & Control of complex ground station infrastructures

Geospatial Information
Geospatial applications and services
- Land management
  - Forestry, waste crime, harvest prediction
- Maritime surveillance and vessel detection
  - Oil spill response, illegal fishing, piracy
- Infrastructure stability monitoring
  - Power stations, bridges, dams, rigs, industrial plant
- Flood Risk mapping
  - Near real-time flood monitoring across the UK

Value added products
- Cartographic mapping
- Orthoimagery and 3D Digital Terrain Models
- Thematic mapping (agriculture, geology)

Satellite Imagery services
- Radar – mainly COSMO-SkyMed data
- Optical – third party resales
- Ground Station Tasking and reception
COSMO-SkyMed constellation

Four identical 1700kg satellites
619 km up travelling at 18 km/sec⁻¹
8 overpasses per day
4 imaging modes & resolutions
Better than 3 hour response time

 Doesn't need solar illumination
Sensitive to surface textures
Telespazio VEGA capabilities

S-SHM
- Motion monitoring system based on GNSS technology designed to deliver high accuracy 3D motion monitoring in real time.
- Optimised for fixed man-made structures like dams, bridges, buildings and natural features such as landslides, volcanoes or ground subsidence.

InSAR : LondonMap
- High density PS InSAR with identifies surface movement with millimetric precision
- Detects how much each major underground infrastructure is affecting London’s ground surface, including movement interaction between different major underground infrastructures to clarify liabilities.

---

Contribution, Roadmap and Exploitation

To provide advice & support in terms of:
- Satellite data acquisition
- Satellite data processing
- Project roadmap
- Facilitating innovation
Thomas Beaton
Senior Earth Observation Engineer – thomas.beaton@telespazio.com

THANK YOU FOR YOUR ATTENTION
Background and Evolution

Regional capacity building training center

Independent regional climate and disaster risk management organization

1986
1990s
2000s

Expanded into project implementation and advisory services

Safer communities and sustainable development through disaster risk reduction
Our Locations

Offices and representations:
- Bangkok, Thailand
- Dhaka, Bangladesh
- Yangon, Myanmar
- Colombo, Sri Lanka
- Phnom Penh, Cambodia
- Jakarta, Indonesia
- Bihar State, India
- Kathmandu, Nepal
- Manila, Philippines

Partnerships
Core Principles

- Science
- Systems
- Applications

The Cycle of Disaster Management

- Risk Management
  - Preparedness
  - Prediction and Early Warning
  - Mitigation

- Crisis Management
  - Protection
  - Recovery
  - Impact Assessment
  - Response
  - Reconstruction
  - Recovery
End-to-End Early Warning Systems

Methodology

Hazard & Basic Data
- Hazard data
  - Storm Surge
  - Cyclone
  - Tsunami

Base Data
- Admin
- Topography
- Demography

Hazard Assessment
- Storm Surge National Study Results - DMC
- Cyclone National Study Results - DMC
- Tsunami National Study Results - DMC

Physical
- Buildings footprints
- Building typology
- Roads
- Infrastructure
- Livelihood hotspots

Social
- Population
- Vulnerable groups
- Livelihoods
- Literacy
- Household economy

Exposure Data

Exposure Analysis

Vulnerability Functions
- Social
- Physical

Risk Estimation
- Sectoral risk due to multiple hazards in a geographic area

End-to-end Early Warning Systems for Cyclones, Storm Surges & Floods in Bangladesh, Vietnam, China & Lao PDR

Atmospheric and Hydrological Modeling @ ADPC
Exposure
Senthur - Cyclone

[Images of current buildings and cyclone exposure map]
Vulnerability Function
Building for Cyclone

<table>
<thead>
<tr>
<th>Structure No.</th>
<th>Building Material</th>
<th>Goyal et al. (2012)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Concrete, concrete and wood, masonry, brick with tiles (UH); roof:</td>
<td>SE</td>
</tr>
<tr>
<td>2</td>
<td>Clay, wood, bamboo, zinc, corrugated iron, with flexible roof</td>
<td>NE</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Damage States</th>
<th>Mean V (m/s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>29.0</td>
</tr>
<tr>
<td>II</td>
<td>35.0</td>
</tr>
<tr>
<td>III</td>
<td>41.0</td>
</tr>
</tbody>
</table>

Enhancement factor
Good = 1.00
Poor = 1.40

<table>
<thead>
<tr>
<th>Damage State</th>
<th>NEF</th>
<th>SEG</th>
<th>SEF</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>14.0</td>
<td>25.0</td>
<td>17.9</td>
</tr>
<tr>
<td>II</td>
<td>25.0</td>
<td>45.0</td>
<td>22.1</td>
</tr>
<tr>
<td>III</td>
<td>60.0</td>
<td>60.0</td>
<td>42.0</td>
</tr>
</tbody>
</table>

NE - Non-engineered
SE - Semi-engineered

"Vulnerability of rural houses to cyclonic wind"
Goyal, K.P., 2012
Risk Assessment

Multi-hazard Risk Assessment at National Level

City-level Hazard, Vulnerability, and Risk Assessment

Drought Susceptibility Map of Nepal

Myanmar Disaster Risk Decision Support System (DSS) (Geonode based)
ADPC WRF Modeling system: Since 2012

3 Day Weather Forecast for South Asia and South East Asia
WRF ROM: 40km with CFS Data

Monitoring and Warning

Digital Analysis and Display System
(introduced by MET-Norway and ADPC)

DIANA Visualization software installed
in Myanmar and Bangladesh
Cyclone forecasting

Storm surge modeling
Digital Cyclone/Typhoon Tracking using Google Map
(data source: WRF simulation)

SERVIR-Mekong
(https://servir.adpc.net/)
Virtual Rain and StreamGauge Data Service (VRSG)
(http://vrgc-servir.adpc.net/index.html)

Regional Drought and Crop Yield Information System (RDCYIS)
(release soon)
Bangladesh Climate Data Portal (Developed for Myanmar as well)  
(http://brmd.wowspace.org/team/hornex.php)
Further improvement of EWSs with Digital Technology

- **Risk Knowledge**
  - Online platforms (mobile/ Desktop) to access risk maps / risk profiles, etc

- **Hazard monitoring and detection**
  - Mobile Apps for crowdsourcing to monitoring extent / severity of events
  - Online platforms for accessing ground observations
  - Visualization software (mobile/ Desktop) for ground-based and space-based observations

- **Dissemination and communication**
  - Early Warning Apps for dissemination of alerts and warnings
  - Population Alerte systems
  - Cell broadcasting
  - Virtual Private Network (VPN)
  - Satellite communications
  - Digital media

- **Response Capacity**
  - Online portals / mobile Apps on safer shelters and evacuation routes
THANK YOU
FOR YOUR ATTENTION

Facebook Group: Asian Disaster Preparedness Center  @ADPCnet
GEOINFORMATICS FOR DISASTER RISK MANAGEMENT
Case Studies from Sri Lanka

Srima I Samansiri
Assistant Director R&D
DISASTER MANAGEMENT CENTRE

CONTENTS

1. Disaster Management in Sri Lanka
2. Past Disaster Occurrence Inventory
3. National Hazard and Risk Assessment
4. Earth Observation in Disasters
5. OSM Based Exposure Mapping 02 Case Studies
6. Spatial Data Sharing in DM
Area – 65,000 sqkm
Population – 21 Million

Sri Lanka

Population – 21 Million
Area – 65,000 sqkm
103 rivers
2 Monsoons
2 Inter Monsoons

Sri Lanka Climate Calendar

Source: Dr Lasaq, Columbia University
FLOODS DURING THE SOUTH WEST MONSOON

LANDSLIDES
Legal and Institutional Setting

Disaster Management Act No 13 of 2003 establishes National Council for Disaster Management. Disaster Management Centre is established to implement the directives given by NCDM.

Disaster Management Centre

[Organizational Structure Diagram]

[Images of Disaster Management Centre facilities]
OVERVIEW – Disaster Management in Sri Lanka

- Composition – Chair – HE the President, Vice Chair – Pri-Minister, Leader of Opposition, 20 Ministers of selected subjects, 09 Chief Ministers, 05 Members of Opposition

Functions
- to formulate a national policy and program on the management of disasters
- to prepare and formulate the National Disaster Management Plan and the National Emergency Operation Plan based on the national policy
- to monitor the implementation of the National Disaster Management Plan and the National Emergency Operation Plan
- to facilitate emergency response, recovery, relief, rehabilitation and reconstruction in the event of any disaster
- to direct, coordinate and monitor the activities of the Disaster Management Centre

- In 2005 – Establishment of Disaster Management Centre and Ministry of Disaster Management
- 2006 – 2016 Disaster Management Road Map in parallel to the Humanitarian Framework for the Action
- 2010 – Disaster Management Policy
Past Disaster Occurrences Database
Sri Lanka

www.desinventar.lk

Data Sources

- Daily Situation Reports (EOC published Situation Reports)
- News Papers and other media reports
- Stakeholder organizations (Wildlife, Forest, Central Environment Authority etc)
**Summary of Damage and Losses 2000 - 2014**

<table>
<thead>
<tr>
<th>District</th>
<th>Damage</th>
<th>Debris</th>
<th>Injuries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area 1</td>
<td>100</td>
<td>50</td>
<td>10</td>
</tr>
<tr>
<td>Area 2</td>
<td>200</td>
<td>100</td>
<td>20</td>
</tr>
<tr>
<td>Area 3</td>
<td>300</td>
<td>150</td>
<td>30</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Province</th>
<th>Undamaged</th>
<th>Damaged</th>
<th>Injured</th>
</tr>
</thead>
<tbody>
<tr>
<td>Province 1</td>
<td>1000</td>
<td>500</td>
<td>100</td>
</tr>
<tr>
<td>Province 2</td>
<td>2000</td>
<td>1000</td>
<td>200</td>
</tr>
<tr>
<td>Province 3</td>
<td>3000</td>
<td>1500</td>
<td>300</td>
</tr>
</tbody>
</table>

| Overall   | 4000      | 2000    | 400     |
Distribution of Damage & Losses

Number of Affected Population
Number of Deaths
Number of Houses Damaged and Destroyed

Highlights of Greater Damage and Losses during 2005 - 2009:
- Highest deaths reported in Ampara District (Tsunami, 2004)
- Highest number of population affected in Batticaloa District (due to floods and cyclone) and Moneragala District (due to Drought)
- Housing damage is prominent in Batticaloa and Jaffna Districts

HAZARD PROFILES DEVELOPMENT FOR SRI LANKA 2008 - 2012

Flooods
Department of Irrigation

Landslides
NBRO

Drought
Department of Agriculture

Cyclones
Department of Meteorology

Lightning

Tsunami
Coast Conservation Department

Sea Level Rise

Storm Surge

Coastal Erosion

Launched on 26th December 2012

www.dmc.gov.lk
Tsunami Scenario Modelling

(c) Makran off Iran & Pakistan (Mw=8.3)

'Maximum-Credible' Tsunami Scenarios in the Indian Ocean Basin

Maximum 'Tsunami Heights'

(a) Southern Sumatra (Mw=9.3)

(b) Arakan off Myanmar (Mw=8.8)

(c) Northern Andaman - Sumatra (Mw=9.1)

Source: Dr. James Wigram, University of Reading

Tsunami due to an Earthquake of Mw = 9.3 in Southern Sumatra Seismic Zone

Tsunami due to an Earthquake of Mw = 8.8 in Arakan Seismic Zone off Myanmar

Source: Dr. James Wigram, University of Reading
Tsunami Hazard Map

Computed inundation distribution due to an event similar to 2004 tsunami

Tsunami Inundation Map – District Level (Galle)

Flow Depth
- < 0.5 m
- 0.5 - 2 m
- > 2 m

Galle District (part of)

Indian Ocean
Storm Surge

Coastal Erosion / Sea Level Rise
Landslide Hazard Mapping

Cyclone & High Wind Hazard
Drought Map

Flood Inundation Map - Gin Ganga
SECTOR LEVEL EXPOSURE MAPPING - Schools

District Profile of Tsunami Exposed Schools

Tsunami Risk Vs Early Warning Towers
PHASE II
Development of Multi-Hazard Risk Profile for Sri Lanka 2016 - 19

Scope of Work

Risk Map Development for
- Riverine Floods - 7 River basins
- Urban Floods - 23 Urban Cities
- Tsunami - (Northern Coast)
- Storm Surge - (Entire Coast)
- Drought— (Entire Country)
- Strong Winds / Cyclone — (Entire Country)

- Value – 1.5 US$ Million
- Duration 2016 – 2019: 48 Months
07 River Basins

- Mundeni Aru Basin (1475 sqkm)
- Kirindi (1230 sqkm)
- Mi Oya (1113 sqkm)
- Yn Oya Basin (1782 sqkm)
- Welawe Ganga Basin (2596 sqkm)
- Kalu Ganga (2976 sqkm)
- Bolgoda Oya (366 sqkm)

Earth Observation in Disaster Monitoring
SENTINEL ASIA / INTERNATIONAL CHARTER

- Disaster Management Centre officially started SAS Operations since February 2009
- 08 emergency successful activations
- Became Data Analysis Node (DAN) in 2010
- WINDS receiver has been established in 2011
Sri Lanka with Sentinel Asia

Disaster Management Centre officially started SAS Operations since February 2009

08 emergency successful activations

Became Data Analysis Node (DAN) in 2010

WINDS receiver has been established in 2014

Summary of Earth Observation by Sentinel Asia / Intnl Charter

<table>
<thead>
<tr>
<th>Disaster Type</th>
<th>Activation Requested</th>
<th>Observation Conducted</th>
<th>Map Disseminated</th>
<th>Peak Time of Disaster</th>
<th>Date</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Floods</td>
<td>17th Dec 2009</td>
<td>18 Dec 2009</td>
<td>No map generated</td>
<td>16 Dec 2009</td>
<td>ALOS P1</td>
<td>Un successful due to cloud</td>
</tr>
<tr>
<td>Floods</td>
<td>17 May 2010</td>
<td>18 May 2010</td>
<td>16 May 2010</td>
<td>ALOS P1</td>
<td>Successful</td>
<td></td>
</tr>
<tr>
<td>Floods</td>
<td>06 Dec 2010</td>
<td>09 Dec 2010</td>
<td>10 Dec 2010</td>
<td>8-10 Dec 2010</td>
<td>ALOS P1</td>
<td>Successful</td>
</tr>
<tr>
<td>Floods</td>
<td>11 Jan 2011</td>
<td>12 Jan 2011</td>
<td>14 Jan 2011</td>
<td>10-12 Jan 2011</td>
<td>ALOS P1</td>
<td>Successful</td>
</tr>
<tr>
<td>Floods</td>
<td>04 Feb 2011</td>
<td>08 Feb 2011</td>
<td>07 Feb 2011</td>
<td>03-05 Feb 2011</td>
<td>ALOS P1</td>
<td>Successful</td>
</tr>
<tr>
<td>Landslide</td>
<td>01 Nov 2014</td>
<td>02 Nov 2014</td>
<td>Not generated</td>
<td>30 Oct 2014</td>
<td>ALOS 2</td>
<td>Observation was successful, Results was not successful</td>
</tr>
<tr>
<td>Floods</td>
<td>29 Sep 2015</td>
<td>01 Oct 2015</td>
<td>03 Oct 2015</td>
<td>30 Sep 2015</td>
<td>ALOS 2</td>
<td>Successful</td>
</tr>
<tr>
<td>Floods</td>
<td>04 Nov 2016</td>
<td>16 May 2016</td>
<td>18 May 2016</td>
<td>30 Oct 2016</td>
<td>ALOS 2</td>
<td>Successful</td>
</tr>
</tbody>
</table>
Efficiency of Satellite Activation (Case – May 2010)

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010.05.17</td>
<td>-</td>
<td>Third consecutive day received heavy rain to Western Province.</td>
</tr>
<tr>
<td>2010.05.17</td>
<td>14:00</td>
<td>Consultation with Nat. Department, Mr. UYLU, Omanisouza, Dr. Arvand,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Naaibestan and M. RUIB Sandas</td>
</tr>
<tr>
<td>2010.06.17</td>
<td>-18:00</td>
<td>Request image activation via RIS to JAVA, Satellite tracking Centre @ Telesat</td>
</tr>
<tr>
<td>2010.05.16</td>
<td>3:30</td>
<td>Received satellite observation plan, to acquire ALOS PALSAR</td>
</tr>
<tr>
<td>2010.08.19</td>
<td>17:00</td>
<td>Emergency observation via Western Province</td>
</tr>
<tr>
<td>2010.08.20</td>
<td>3:30</td>
<td>Received ALOS Radar radiance from JAVA</td>
</tr>
<tr>
<td>2010.08.30</td>
<td>-9:30</td>
<td>Produced draft inundation maps and provided to the valve</td>
</tr>
</tbody>
</table>

Observation can be made within 48 hours

RADAR is an acronym that stands for:

Radio Detection and Ranging

Optical and Microwave Portions of the Electromagnetic Spectrum (from ~400 nm to 30 cm)
Emergency Earth Observation

Use of Near Real Time Earth Observation for Emergencies
Maps are available [www.dmc.gov.lk](http://www.dmc.gov.lk)

Kalutara District - Floods
2006/06/03 ALOS Data

Flood May 2010 Western Province
Flood January & February 2011
Eastern Province Sri Lanka

10.30 am 06th Feb. 2011 PALSAR 5m
11.45 pm 06th Feb. 2011 PALSAR 100m
Meeriyabedda Landslide – Sentinel Asia (ALOS2)

Acquisition 31 Oct 2014
Meeriyabedda Landslide – International Charter (ASTER)

Disaster images were acquired by ASTER satellite. Please note that the accuracy of the product is not guaranteed.

- **Pre Image:** World View 2
- **Resolution:** 2m
- **Acquisition Date:** 08 April 2012
- **Copyright:** (C) COPYRIGHT 2012 DigitalGlobe

**Post Image:** ASTER
- **Resolution:** 15m
- **Acquisition Date:** 06 Nov 2014
- **Coordinate System:** Geographic
- **Datum:** WGS 1984
- **Units:** Degree

![Image of landslide area]
Historical Flood Mapping

Map historical flood events by Satellites

- May 2003,
- Dec 2007,
- Nov/Dec 2008,
- May 2010
Figure 3: Part of the Maximum Flood Extent map in Western Sri Lanka in May 2010

Flood Map of Sri Lanka

Compiled based on satellite and field observation
Experience from Flood and Landslide
May 2016

- Activated Sentinel Asia
- Activated International Disaster Charter
- Activated Humanitarian OpenStreet Team (HOT)
- GFDRC provided post disaster images over Aranaysake
- IWMI and OCHA Deployed at DMC
- Survey Department - Ground Mapping
Satellites Contributed Data

**Radar Satellites**
1. ALOS Palsar – Japan
2. RISAT – India
3. Radar Sat – Canada
4. Terra SAR X – Germany

**Optical Satellites**
1. Plaides – France (0.5 m)

Aranayake – Landslide 16th May 2016

PRE IMAGE March 2016

POST IMAGE June 2015
## Satellite Activated

<table>
<thead>
<tr>
<th>Satellite</th>
<th>Program</th>
<th>Observation Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resource Sat 2</td>
<td>Sentinel Asia</td>
<td>27 May 2017</td>
</tr>
<tr>
<td>TerraSARx (Radar)</td>
<td>International Charter</td>
<td>28 May 2017</td>
</tr>
<tr>
<td>Sentinel 2</td>
<td>International Charter</td>
<td>28 May 2017</td>
</tr>
<tr>
<td>THEOS</td>
<td>Sentinel Asia</td>
<td>28 May 2017</td>
</tr>
<tr>
<td>RadarSat2 (Radar)</td>
<td>International Charter</td>
<td>29 May 2017</td>
</tr>
<tr>
<td>TerraSARx (Radar)</td>
<td>International Charter</td>
<td>30 May 2017</td>
</tr>
<tr>
<td>ALOS Palsar (Radar)</td>
<td>Sentinel Asia</td>
<td>30 May 2017</td>
</tr>
<tr>
<td>Sentinel 1 (Radar)</td>
<td>International Charter</td>
<td>30 May 2017</td>
</tr>
<tr>
<td>Resource Sat 2</td>
<td>Sentinel Asia</td>
<td>30 May 2017</td>
</tr>
<tr>
<td>MOMPSAT5</td>
<td>Sentinel Asia</td>
<td>30 May 2017</td>
</tr>
</tbody>
</table>
5 Disaster Exposure Mapping

STUDY AREA

Manmunai North DS Division, Batticaloa District

Approximately 30,000 buildings
24,928 Families
Building seen on Satellite Image
Buildings might affected by Tsunami

Total buildings – 32,000
Total tsunami affected buildings – 15,000
Determination of Relative Risk – Indicator Based

HAZARD

<table>
<thead>
<tr>
<th>Material</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metal</td>
<td>10</td>
</tr>
<tr>
<td>Glass</td>
<td>9</td>
</tr>
<tr>
<td>Wood</td>
<td>8</td>
</tr>
<tr>
<td>Foam</td>
<td>7</td>
</tr>
</tbody>
</table>

VULNERABILITY

<table>
<thead>
<tr>
<th>Type</th>
<th>Zone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plywood</td>
<td>10</td>
</tr>
<tr>
<td>Brick</td>
<td>9</td>
</tr>
<tr>
<td>Glass</td>
<td>8</td>
</tr>
<tr>
<td>Foam</td>
<td>7</td>
</tr>
<tr>
<td>Metal</td>
<td>6</td>
</tr>
</tbody>
</table>

RISK

<table>
<thead>
<tr>
<th>Floor Level</th>
<th>Zone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Above 3</td>
<td>10</td>
</tr>
<tr>
<td>2-3 feet</td>
<td>9</td>
</tr>
<tr>
<td>1-2 feet</td>
<td>8</td>
</tr>
<tr>
<td>1 foot</td>
<td>7</td>
</tr>
</tbody>
</table>

TSUNAMI RISK PROFILE
Buildings – Manmunai North

<table>
<thead>
<tr>
<th>Risk Level</th>
<th>Number of Buildings</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Risk</td>
<td>4309</td>
</tr>
<tr>
<td>Moderate Risk</td>
<td>5563</td>
</tr>
<tr>
<td>Low Risk</td>
<td>5054</td>
</tr>
</tbody>
</table>
Buildings might affected by Tsunami

Total buildings = 32,000
Total tsunami affected buildings = 15,000

Building Profile of Tsunami Affected Area
ATTANAGALU OYA DISASTER EXPOSURE MAPPING PROJECT

Attanagalu Oya Exposure Mapping Project
Scope of the Works

- Map buildings, roads and land use of Attanagalu oya lower basin area (Gampaha, Katana, Ja-Ela and Minuwangoda DS Divisions)
- Conduct field survey and obtain characteristics of buildings and update the building database
- Capacity Building - Promote OpenstreetMap tool among Government Organizations and Universities
Methodology

Before and After Building Tracing of Building Gampaha Town

BEFORE

19th October 2015

AFTER

23rd October 2015
Attanagalu Oya Project Area

Building Survey Questionnaire filled in Digital Form
CASE STUDY
Ja-Ela Divisional Secretariat

Building Exposure
39,897 Buildings

Building with Flooding
Project Outputs – Launched Today

- Printed GN Maps with boundary, buildings and land use
- Digital database of buildings with attributes
Power of Volunteerism
Mapping with OSM – Flood May 2016

3429 buildings - January 2016


History of this Activation
Reactivity of the OSM Community
- 30 May - Over One Million Map Changes by just under 400 Mappers
- 28 May - Over 300,000 Buildings have been contributed by 310 Mappers
- 25 May - Over 200,00 Buildings have been contributed by 205 Mappers
- 21 May - Over 80,000 Buildings have been contributed by 305 Mappers
- 21 May - Over 50,000 Buildings have been contributed by 241 Mappers
- 18 May - HOT received a request to Activate.

SPATIAL DATA SHARING

DATA REPO DIGITAL SUBMISSIONS WELCOME
UNSPIDER TAM Recommendations

1. Policy and Coordination
   - DM Policy update
   - Improve inter-agency coordination
   - Sharing mechanism between data providers and users / Institute strengthen
   - Data sharing policy / NSDI
   - Data policy for interoperability / common arrangement to obtain satellite data

2. Data and Access / Info Management
   - Improve base line data at 1:10,000 including DEM
   - Development of Hazard & Risk Maps
   - Right to access data from different institutes
   - A dedicated unit for Information Management in DMC
   - Implementation of NSDI

3. Capacity Building
   - Building institutional and individual capacity
Cabinet Paper for NSDI

It took around 01 year to approve this paper...

Sri Lanka Spatial Data Infrastructure

Cabinet decision:
1. To implement NSDI with overall supervision of Prof. Tissa Wijanarana
2. Appointed parliamentary committee to oversee the process
3. Implement Pilot project by Sec MDM
NSDI Implementation 2016-19

Government has allocated 3.5 US $Millions for this work

RISKINFO is the strategy to share all the Risk related data
Drone Mapathon

22 March 2016, Batticaloa
Invite you to be a volunteer and contribute generation and sharing data for others use:

www.openstreetmap.org
www.openaerialmap.org

srimal@dmc.gov.lk

towards a safer Sri Lanka
Introduction

- Who are Opus International Consultants?
- New Zealand is in a high seismic zone,
- Opus International Consultants working with several agencies, private and public to help with post-disaster preparedness

opusinternational.com
Systems

Building Monitoring - SMART
Remote Bridge Monitoring

“Fibre optic sensors could have provided more immediate warning of damage to this rail line north of Kaikoura.”

Quakes drive sensor research
What is SMART?

SMART is a system which has incorporated structural engineering analysis with accelerometer sensors and algorithms to provide clients with real-time information on building or structural performance following an earthquake event. An integrated system has been created that includes not only data collection, but also uses a detailed non-linear assessment of the building to compare the shaking experienced against the assessed building performance.

How SMART works...

- First, the building/structure performance limits are assessed.
- Sensors are then installed at key locations.
- Following the event of an earthquake, Data Acquisition occurs.
- Opus interpret the results of the DA against structural performance.
- The results are then quickly communicated to the user via web interface or text.
Unlike most other monitoring systems, the Opus solution provides an immediate evaluation of the data collected against the building capacity to alert the building user. This is done using a simple traffic light display:

- Safe to occupy
- Carry out an inspection
- Evacuate the building

The Benefits of Using SMART

- Alerts building owners and occupiers in real time
- Accurate information provided on the intensity of shaking the building experienced in a seismic event
- A high degree of confidence given regarding occupancy status following a significant earthquake
- Reduced down-time following a significant earthquake
- Identifies loss of capacity due to seismic event
- Reduces the risk of damage being overlooked
- Provides factual information which can be used for insurance claims

opusinternational.com
Remote Bridge Monitoring

Why do we need it?

- High Productivity Motor Vehicles (HPMVs) introduced in 2010
- 20% of NZ bridges were constructed prior to 1945, to considerably lower load standards than HPMV loading.
- Many of these bridges provide key links for freight.
- However, some bridges on critical freight routes are very costly to strengthen.
- Vehicle Mass Limits are continuing to increase (2016 VDAAM Rule)
Structural Response Monitoring Process:

1. Preliminary diagnostics
2. Analysis and calibration
3. Assessment of failure mechanisms
4. Focussed response monitoring
5. Risk mitigation systems

Structural Response Monitoring

- Use of data loggers, displacement sensors and crack sensors.
- Low cost, remotely configurable monitoring system that can be installed on any bridge
  - Small or large - scalable, sensor clusters
  - With/without access to mains - low powered
  - Made from any material - concrete, steel, wood
  - With/without mobile phone coverage - LoRA
Thank you for listening. Any questions?
TECHNOLOGY CAPABILITIES TOWARD DISASTER RISK REDUCTION IN MALAYSIA

MOHD ARIFF BAHAROM
DEPUTY DIRECTOR GENERAL PLANNING & POLICY SECTOR NATIONAL DISASTER MANAGEMENT AGENCY (NADMA) PUTRAJAYA Email: ariff@nadma.gov.my

INTRODUCTION

In December 2014, Malaysia faced its worst monsoon flood affecting several states. 541,896 people were affected RM2.58 billion in losses causing extensive damage to infrastructure.

Cabinet consider the memorandum of the Prime Minister dated 26th August 2015 agreed:
  “the establishment of the National Disaster Management Agency (NADMA) under the Prime Minister’s Department taking over the responsibility from the National Security Council.”

NADMA officially formed on 1st October 2015 with the consolidation of the Disaster Management Division of the National Security Council, Post-Flood Recovery Unit of the Prime Minister’s Department and the Special Malaysia Disaster Assistance and Rescue Agency (SMART). Designated as a coordinating and leading agency under Prime Minister’s Department for disaster management.
LIST OF NOTABLE DISASTERS IN MALAYSIA


January 1971
Kuala Lumpur Flood

26 December 1996
Tropical Cyclone Greg

26 December 1998
North East Monsoon Flood

26 December 1993
Collapse of Highland Towers

July 2001
National rail bomb

26 December 2004
Tsunami

9 June 2013
Sabah Earthquake

DISASTER RISK REDUCTION SUPPORT TOOLS

- Initiated a step forward action for disaster risk reduction by changing the old policy that favors a post disaster management into pre-disaster management policy.

- Utilizing modern and advance technology techniques to support disaster prevention, forecasting, response and building resilience through:
  - Forecasting & early warning;
  - Disaster hazard & risk assessment;
  - Monitoring & Implementation
EARTHQUAKE AND TSUNAMI MONITORING NETWORKS

- 39 Seismic Strong Motion Networks
- 25 Seismic Weak Motion Networks
- 17 Tidal Gauges Networks
- 18 Coastal Camera Networks
- 53 Tsunami Siren Networks

HAZARD & RISK ASSESSMENT

- Utilization of geospatial technology techniques to assess the disaster risk especially for slope related hazards;

- Application of satellite imageries for forestry activity monitoring
The form of disasters in the future may become more complex. Fast-paced developments in technology have the potential to help the world rein in the impact of natural and human-induced hazards. Co-development of social and technological systems is necessary in making a sustainable and disaster resilient community.
THANK YOU
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<thead>
<tr>
<th>Name</th>
<th>Institution</th>
<th>Country</th>
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<tbody>
<tr>
<td>1. Prof. Karl Dayson</td>
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<td>27. Adam Hiley</td>
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<td>30. Ian Everall</td>
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The University of Salford is in the United Kingdom where academia, industries and policy makers meet to map global development challenges.

The THINKlab is one of the key research hubs at the University of Salford. It supports research-led industries centred knowledge co-production using appropriate technologies in order to promote the future digital economy.

Interdisciplinary researchers in the THINKlab focus on neutralising risk in every stage of the industrial and development processes for building resilient systems around the globe. If you would like to know more about our activities, please feel free to visit www.salford.ac.uk/thinklab or email us at c.kocsis@salford.ac.uk.