Southeast Asia Disaster Risk Insurance Facility

PROTECT THE GREATEST HOME OF ALL:

OUR COUNTRIES

SEADRIF is a regional platform to provide ASEAN countries with technical advice to increase their financial resilience to climate and disaster risks.
Overview of the Knowledge Series

FACTSHEETS 5 and 6
- Roles and responsibilities for the government officials within an internal insurance program, the associated stakeholders, including auditing, compliance and governance, supervisory.
- Multi year aspects such as renewals and re-assessment of exposures.
- Review of procurement considerations
- Dealing with claims management
- Incorporating innovations and technologies

FACTSHEETS 7 and 8
- Development of an implementation roadmap for a public asset financial protection program
- How governments can agree objectives and build consensus around priorities
- How to develop internal governance and oversight functions, and ownership at each level of the insurance program
- How risks are allocated across asset owners and operators

FACTSHEETS 1 and 2
- The importance and development of Public Assets Registries, and associated Enterprise Asset Management systems.
- How to assess and quantify asset exposure, sources of data, requirements for insurance transactions
- Introductions to the use of catastrophe analytics, burning cost / technical and market rates, tariff structures, risk based pricing methods, and underwriting.

FACTSHEETS 3 and 4
- Roles and options available to construction of cost-effective insurance, including common insurance structures and case studies, their pros and cons against considerations of budgets, risk appetites, and government priorities
- Introduction of pooling and mutualization of large scale public assets insurance programs
- Insurance/reinsurance concepts of retention, deductible and exclusion
Emerging technologies for Public Asset Insurance

Facilitator: Benedikt Signer

Speakers:
Matt Foote, Climate and Resilience Hub, Willis Tower Watson
Julie Dela Cruz, Arcadis
Lynette Tan, Singapore Space and Technology Ltd
Sally Sfeir-Tait, RegulAltion Ltd
Emerging technologies and trends

Interconnected developments affecting the future of public asset financial protection

- Data privacy management
- Building Information Modeling (BIM)
- Criticality analysis
- Scenario analysis
- Taskforce on Climate-Related Financial Disclosure (TCFD)
- Climate change and future risks
- Shock responsive disaster risk financing
- Cat modelling
- Systems mapping
- Earth Observation data (Satellite and remote sensing)
- Big data analytics
- Internet of Things

Interconnected developments affecting the future of public asset financial protection
Which of the emerging trends/technologies mentioned are most interesting to you? (select top three)

- Internet of things and big data analytics
- Earth observation and remote sensing
- Systems mapping and criticality analysis
- Data privacy and security management
- Building information modeling
- Catastrophe modeling
- Scenario analysis and stress testing
- Incorporation of future climate risks
Next generation catastrophe modeling

Matt Foote
Senior Director, Climate and Resilience Hub, Willis Towers Watson
The challenge of real asset risk assessment

• Public assets and infrastructure (‘real’ assets’) have not been well-represented in catastrophe models or analytics

• Insurance / reinsurance products rely on data and modelling to quantify risk and enable effective pricing / capacity
  • Complex systemic risks – tangible and intangible
  • Asset lifetimes (20 years or more)
  • Climate risks are not just ‘shock’ events – chronic climate hazards are also critical to lifetime resilience and sustainability
  • Value at risk – requires consistency of quantification

• Poor data / analytics reduces effectiveness / availability of financial risk transfer options
Towards the next generation of data, models and products

- **Hazard data**
  - Multi-peril, chronic and acute/shock – via probabilistic models and scenarios
  - Regional and global coverage
  - Open data and modelling resources

- **Exposure, vulnerability and resilience** – integrating risk engineering
  - Consistent exposure data using data capture standards
  - Lifecycle risk management and resilience benefits
  - Integrate into modelled risk assessment
  - Systemic exposure / resilience (interdependencies, critical assets)

- **Risk communication and decision making**
  - Value at risk metrics (asset values, service provision) – balance sheet
  - Scenario tools – ‘what if’ strategic planning and risk transfer

- **Financial innovation**
  - Encourage and quantify benefits of investment in physical / operational resilience
  - New risk transfer products (reinsurance, bonds, parametrics) that reflect resilience benefits
Participating Institutions

An international coalition of investors, lenders, insurers, engineers, modellers and multilateral institutions
Representing over $10 Trillion in assets under investment / management
CCRI aims to address the different levels (systems, asset and financing) in which the mispricing of physical climate risks in investment decision-making manifests, recognising both their interdependence and as well as their specific needs.

Financial risk transfer to encourage long term resilience investment is a key component.

1. **Systemic Risk**
   - An **Investment prioritisation tool** capable of identifying key locations in a given jurisdiction with highest concentrations of economic and social value at risk over the next 20y.

2. **Asset Design & Structuring**
   - A **Cash Flow Modelling Framework** for the interpretation of Physical Climate Risks in asset valuation practices.

3. **Financial Innovation**
   - **Resilience Bonds** – a financial instrument that includes credit and insurance risk with the ability to advance and reward an effective integration of physical climate risks in a given investment.

Key themes:
- Asset priority (defined by value / service provision)
- Chronic and shock (catastrophe) hazards and risk
- Asset value and exposure
- Vulnerability and resilience
- Asset lifecycle (20 years)
- Measurement / recognition of increased physical / systemic resilience

Data:
- Hazard
- Exposure and value at risk
- Vulnerability and resilience
- Network / supply chain

Analytics:
- Chronic climate risk (e.g. heat stress, water stress, sea level)
- Shock (e.g. storm, flood, fire)
- Catastrophe modelling
- Value at risk
- Systemic / supply chain and interdependencies

Informed decision making.
Key innovations that can assist

• Integrating new approaches to model asset vulnerabilities and resilience into climate / catastrophe risk models
  • Systems and network analytics
  • Risk engineering to capture and model long term resilience benefits

• Better data to represent the nature of assets and their resilience
  • consistent open exposure data standards to improve asset data suitability
  • exploitation of geospatially referenced and valuation data

• Develop the next generation of physical climate and disaster risk models to provide forward-looking risk estimation
  • Integrate slow onset / chronic and acute / shock hazards corf multi-perils
  • Scenario modeling to support strategic decisions against potential future states
Lynette Tan
Chief Executive
lynette.tan@space.org.sg
DEVELOPMENTS IN SATELLITES
USE OF SATELLITES IN THE INSURANCE INDUSTRY
Interplay between Earth observation and risk financing

Transdisciplinary approach of using Earth observation data, risk information products, and integrated decision support tools delivers the confidence needed to make improvements in timeliness, readiness, effectiveness and action.

Particularly important to augment insurers’ existing risk information with Earth observation data for natural disasters like floods, landslides, hurricanes and earthquakes and construction and engineering projects at cities near the coast or on volcanoes.

Two main categories of satellite data:

1. Archived data: In conjunction with models, archived data can contribute to prediction and risk assessment tasks. Archived data also provides objective evidence for claims validation;

2. Real time data: During a catastrophe, rapid dissemination of real time data assists in loss control and logistics planning for immediate response by loss adjusters.
As part of the European Space Agency’s activities to develop the industrial use of Earth observation-based services to stimulate growth within the European service sector, a consortium of insurers and reinsurers, including Swiss Re, Munich Re, Allianz, Willis and Guy Carpenter, collaborated with Zurich-based catastrophe insurance market data company PERILS to assess the use of receiving realtime flood extent information based on data from a constellation of six European and Canadian remote sensing satellites.

Satellite data on the area of significant floods was delivered to a web-based platform hosted by PERILS for the business partners.
USE OF SATELLITES IN THE INSURANCE INDUSTRY

Developments in the satellite industry

The price and technological advancements of satellites have significantly lowered the barrier of entry: Today, a $3 million satellite that weighs less than 10 pounds can capture significantly sharper images than a $300 million, 900-pound satellite built in the late 1990s.

There are now 730 satellites observing Earth from space, with 2,220 more coming in the next 10 years.

Insurers and financial institutions don’t need to launch satellites into space to access this new source of information — they can simply buy the analysis from satellite operators.

According to The Globe and Mail, satellite imagery “speeds up predictions of how many claims insurers will receive and can provide enough information to cut down on the amount of time adjusters must wade through disaster zones.”

It also reported that “Swiss Re uses a software system called CatNet to overlay satellite images of severe weather onto Google Maps, allowing them to zoom in and assess the extent of a disaster soon after it occurs.”
HADR CHALLENGE
HADR CHALLENGE
Humanitarian Assistance and Disaster Relief

The application of satellite technology and its increasing role in providing quick, accurate and effective response to frequent and complex disaster situations is evident.

Across the world, countries have recognized the need of utilizing remote sensing satellite technologies as a critical tool in real-time disaster management.

The HADR challenge was launched to tap into the creativity of space tech companies and researchers to identify translatable solutions to complex problems of coordination and technology usage in HADR.
Every year, the cost of damages from natural disasters such as floods, earthquakes and landslides amount to approximately **300 billion USD**.

In the case of a natural disaster, it is crucial for governments to quickly address recovery efforts and manage the financial aspects of the disaster’s impact. This is especially true for **market-emerging economies such as countries in Southeast Asia**.

The World Bank Group’s **Southeast Asia Disaster Risk Insurance Facility (SEADRIF)** has started a regional catastrophe risk pool especially for **flood risks developed by and for Cambodia, Lao PDR, and Myanmar** with technical assistance from the **World Bank Disaster Risk Financing & Insurance Program (DRFIP)**.
HADR CHALLENGE
Humanitarian Assistance and Disaster Relief

Develop an innovative programme/application
Aim is to provide a significant increase in efficiency and effectiveness of humanitarian assistance and disaster relief operations.

Programme/app shall make use of a variety of data from space or airborne sensors as well as other sources
Assuming communications over a relief area can be established through an ad-hoc network provided by satellite technology.

Supporting Partners

Robust and reliable communication solutions
Data & information verification and analytics
Mapping Solutions via satellite imagery
Logistics & telemedicine management through geolocation capabilities
Emerging Technologies for Public Asset Financial Protection: 3D BIM, 5D BIM, 6D BIM and 7D BIM

Julie Christie dela Cruz
Director, Arcadis
OUTLINE OF THE PRESENTATION

01. THE BIM DIMENSIONS
02. WHAT IS 5D BIM
03. EFFICIENCY USING 5D BIM
04. WHAT IS 6D/7D BIM
05. FM and AM in BIM
06. 7D BIM USES AND REQUIREMENTS

Aenean lacinia bibendum nulla sed consectetur.
## IMPACT TO OUR PROFESSION: TECHNOLOGY DISRUPTION

### Probability of professions being affected by technology

<table>
<thead>
<tr>
<th>Profession</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arbitrators and mediators</td>
<td>0.9</td>
</tr>
<tr>
<td>Construction managers</td>
<td>0.8</td>
</tr>
<tr>
<td>Urban planners</td>
<td>0.7</td>
</tr>
<tr>
<td>Surveyors</td>
<td>0.6</td>
</tr>
<tr>
<td>Cost estimators</td>
<td>0.5</td>
</tr>
<tr>
<td>Building inspectors</td>
<td>0.4</td>
</tr>
<tr>
<td>Real estate, property &amp; community assoc. managers</td>
<td>0.3</td>
</tr>
<tr>
<td>Appraisers and assessors of real estate</td>
<td>0.2</td>
</tr>
<tr>
<td>Surveying technicians</td>
<td>0.1</td>
</tr>
<tr>
<td>Real estate brokers</td>
<td>0.0</td>
</tr>
<tr>
<td>Brokerage clerks</td>
<td>0.0</td>
</tr>
</tbody>
</table>

Source: Frey and Osbourne 2013
BIM PROJECT LIFECYCLE
BIM is a data-driven holistic modelling system

COMMON DATA STANDARD IS VERY IMPORTANT
BIM MATURITY LEVELS

Level 0: Paper based

Level 1: Object-orientated computer readable data models

Level 2: Sharing information in a federated model (single source of truth) based on a predefined and collaborative process

Level 3: Open shared information throughout the asset lifecycle, including performance and operation data
CONCEPT OF 5D BIM

BIM 5D is simply addition of Cost to BIM 3D+ 4D BIM (Time)
5D BIM IN THE PROJECT LIFE CYCLE
THE 5D BIM PROCESS THROUGHOUT THE 7 RIBA STAGES

CLEAR UNDERSTANDING OF CLIENT’S NEED
STAGE 0 - STRATEGIC DEFINITION
• Employer’s Information Requirement (EIR) is submitted by employer
• Pre-Contract BIM Execution Plan (BEP) prepared

CONFIDENCE IN DESIGN AND DELIVERY
STAGE 1 - PREPARATION AND BRIEF
• Comprehensive Delivery Plan (Post-Contract BEP)
• Protocols
• Feasibility Cost Studies

BETTER DESIGN COORDINATION AND APPROVAL
STAGE 2 - CONCEPT DESIGN
• Development of “Cost-Ready” Model
• Cost Modelling Guide
• Cost Coding Process
• Clash Detection

START HERE
I want to build a mall!
The project is feasible.
As per the BEP...
We’re ready to proceed to construction.

HAND OVER ASSET RICH DATA
STAGE 6 - HANDOVER
• Submit Asset Information Model as per BEP and EIR

UNCERTAINTIES IN DESIGN ARE ADDRESSED AT EARLIER STAGE = LESSER VARIATION CLAIMS
STAGE 5 - CONSTRUCTION
• Interim Payment Valuation
• Variation Assessment

BETTER DESIGN = LOWER RISK IN PROCUREMENT
STAGE 4 - TECHNICAL DESIGN
• Tendering
• Transparency of Data
• Single Source of Truth

FASTER DELIVERY OF COST ESTIMATES = EARLY COST CERTAINTIES
STAGE 3 - SPATIAL COORDINATION
• Maintaining semi-automated cost plan
• Benchmarking
• Rate library

BIM TOOLS USED BY ARCADIS:
5D BIM: ENABLING EFFICIENCIES

Added value:

ABOUT 30% is SAVED IN TIME AND COST USING 5D BIM AGAINST TRADITIONAL METHOD.
MORE TIME IS SPENT ON VALIDATION AND QA/QC THAN SPENDING TIME DOING QUANTIFICATION

...creating more value for less money...
6D/7D BIM WORKFLOW

As-Built BIM
Model forms the basis for Asset Model

AIR
Asset Information Requirement (AIR) from the client will define the scope of FM & FM Systems

ASSET LIST
As per AIR, list all the maintainable assets and optimize maintainability with IOT Analytics. This will determine the extent of energy optimization

Sensor data from critical asset of the AIR list are used to analyze & optimize system performance of MEP System

FM Systems
Constant monitoring of MEP System Performance requirements based on the sensor data and usage of the facility & mechanical performance
BIM USES FOR FACILITY MANAGEMENT
Concerns

- Increasing complexity of assets requires more data-driven solutions
- Need for integrated asset information
- Data management
- Undertaking surveys quickly

Solutions

- Automated inspections using drones
- Data collection site tools
- Integrated AM models, incorporating BIM
- Decision support tools for auditing, modeling (digital twins), analytics, maintenance and planning
Summary
THANK YOU
Future proofing data access and collaboration

Sally Sfeir-Tait
Chief Executive Office, Regulation Ltd
Honorary Professor, University College London
What we will talk about

Data access today

Case Study (UK) – Digital Regulatory Reporting

Case study – privacy-preserving data access (AIR Platform)
Data Access today
An ecosystem approach

Today

Future - Decentralised

Multilateral
Case Study – UK Financial Services (Banking)

Background

- UK regulatory need real-time data for financial stability and systemic risk

- Regulatory reporting costs to banks - £2-4Bn/Annually

- Why?
  - Legacy systems
  - Data quality (lineage, extraction, transformation)
  - Manual process

High Risk

Low Confidence

No automation
Case Study – UK Financial Services (Banking)

Project Phases

- Phase 1 – Viability POCs (2017-2018)
- Phase 2 – Explore existing solutions (2018-2019)
- Phase 3 – On-going
  - BoE/FCA announce outline plans to develop internal data and analytics capabilities
  - BoE/FCA announce plans to move to data-pull
  - FCA updates internal data reporting system (GABRIEL)
  - Digital Regulatory Reporting critical part of regulators’ Data Strategy
  - FCA leads multiple initiatives as catalyst for privacy preserving data sharing
Case Study – UK Financial Services (Banking)

Why is it relevant?

- Demonstrates problems if no automation *ab initio*
- Demonstrates the importance of a considered technology infrastructure
- Data providers will experience similar costs without automation

Policy, legal and tech must work together

- Data sharing – public-public
- Data sharing – public/private
- Data sharing – private/private (public assets)
Case Study – UK Financial Services (Banking)
Future proofing – Consider macro trends

- Ever increasing cybersecurity threats – Solutions must future proof security
- Exponential growth of data – handling and sharing data very resource heavy
- Next generation technologies (blockchain, federated learning, IoT, domain specific languages)
- Data sharing legislation/data localisation requirements

You don’t have to compromise
Best risk management practices support economic growth
An ecosystem approach

AIR Platform
public/private collaboration platform
• for repeatable and automated data sharing and access
• for data governance in compliance with legislation and policies
• for sharing insight from data

Exploratory insurance and public sector projects with

Public

Confidential

RegulAItion.com
The AIR Platform™ creating a safe and collaborative ecosystem for shared insight

Organisations can harvest insight from the most sensitive data with the confidence that they are not compromising their security or integrity.
How is the AIR Platform different?

Traditional model

AIR Platform™

RegulAtion.com
Thank you
Sally.Sfeir-tait@regulation.com
Knowledge series summary

Benedikt Signer
### Key statistics (May – Oct 2020)*

<table>
<thead>
<tr>
<th>Category</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Webinars</td>
<td>11</td>
</tr>
<tr>
<td>Fact sheets</td>
<td>8</td>
</tr>
<tr>
<td>Different Speakers</td>
<td>25</td>
</tr>
<tr>
<td>Engagement Hours</td>
<td>&gt;18</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Statistics</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unique attendees</td>
<td>323</td>
</tr>
<tr>
<td>Attendees from governments</td>
<td>227</td>
</tr>
<tr>
<td>Organizations/divisions</td>
<td>57</td>
</tr>
<tr>
<td>Attendees attended multiple webinars</td>
<td>142</td>
</tr>
<tr>
<td>Attendees attended over half of the webinars</td>
<td>41</td>
</tr>
</tbody>
</table>

*Data from two webinars not included: 5th Nov (not yet available) and 17th Jun (technical error).*
Follow up from the Knowledge Series

- Online e-learning
- Podcasts and videos
- Compendium of fact sheets
What are the most useful follow-up activities or events after this webinar series, for you or your colleagues? (select top three)

- Continue with webinars series
- Podcast and videos of case studies
- Topic-specific checklist and/or guides
- Template tools and data collection/analysis supports
- Online e-learning course
- Advanced masterclasses on selected topics
SEADRIF: Small group discussions

https://worldbankgroup.webex.com/

Group A
Matthew Foote
Sally Sfeir-Tait
Meeting number: 172 829 8760
Meeting password: GroupANov5

Group B
Julie Christie Dela Cruz
Lynette Tan
Meeting number: 172 396 6082
Meeting password: GroupBNov5

PLEASE RESPOND TO THE SURVEY TO EARN CERTIFICATION FOR THE COURSE!
An ASEAN+3 Initiative
In partnership with The World Bank