

Risk Modelling  
Steering Group

Strategy  
Paper  
Sept 2018

Unlocking the potential of  
collaboration in natural  
catastrophe risk analytics to  
close the protection gap

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## Risk Modelling Steering Group – Strategy paper (Sept 2018)

### References:

- A. RMMG Way Forwards – Strategic Plan (Oct 2017)
- B. Interoperability Project Plan (June 2018)
- C. RMMG ‘Delivery network’ Concept Note (June 2018)

### 1. The RMSG

- a. The Risk Modelling Steering Group (formerly the Risk Modelling and Mapping Group) is an expert working group of the Insurance Development Forum<sup>1</sup> (IDF.) It is international in nature and participants are drawn from the insurance industry, IGOs/NGOs and the scientific research community. It consists of a permanent steering group and sub-groups are formed by willing volunteers to execute specific workstreams.
- b. The RMSG aims to draw together and promote the efforts of individuals, teams and organisations already working in this area. As shown in this paper, it will initiate additional new programmes where gaps are identified. There has been significant progress since 2017 and this paper is therefore a timely update to the previous strategy paper (Reference A.)
- c. In recent months the IDF Steering Committee and senior industry actors have renewed and strengthened their support for the strategic aims of the RMSG. The renaming to RMSG reflects the intention to leverage this interest; by recruiting key individuals to the reinvigorated Steering Group we will give the RMSG strategy the greatest chance of success.

### 2. Vision and strategic priorities for the next 6-12 months

- a. The RMSG is dedicated to improving global understanding and quantification of natural hazards disaster risk, through use, development and sharing of the re/insurance sector’s catastrophe risk modelling capability. Risk literate users in vulnerable countries should be able to access all relevant models and datasets, use them on their preferred platform, develop them further and have trust in the results. The amount of duplicated effort and inefficiency in the risk modelling system should also be reduced.
- b. As RMSG plans have progressed, the strategy has evolved in two threads – modelling infrastructure and content. Current and future workstreams will be grouped under these two themes:

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<sup>1</sup>The IDF was launched at CoP Paris in 2015 by Helen Clark, Administrator of the UN Development Programme, and senior insurance industry figures. Addressing the global protection gap has been central to its thinking, and the IDF has committed to the objectives of the InsuResilience Global Partnership.

- c. **Theme 1: Improvement of modelling infrastructure:** Building efficiency and reducing cost and duplication in the risk modelling and data ecosystem, through continuous development of open platforms, an industry wide interoperability programme and advocacy of open standards. This is complex; both technically and also because of the number of stakeholder interests involved. This effort has and will be led by the (re)insurance industry and with further development and focus will have clear benefits for public, private and third sector actors in the world of Disaster Risk Finance. The goal is that the industry can deliver this platform and ecosystem as the primary toolset for building and running models in the public and third sectors thus delivering a ‘capability building’ approach enabling sovereigns and others to own and manage their risk management.
  
- d. **Theme 2: Model and data content:** A strategic and funded programme of new model and risk data development, model cataloguing, model accessibility, user research, and open standards advocacy, executed through an international network of partners coordinated by the RMSG. The aim is to increase availability and use of open risk models and complementary data sets, particularly in countries covered by InsuResilience objectives. Model development will use the open frameworks and tools developed under Theme 1; in addition to ‘demand-led’ projects the programme will define and deliver a set of benchmark ‘strategic’ region/risk models.
  
- e. **R&D for wider application:** Although not central to its mission, the RMSG also advocates research for the future application of catastrophe risk modelling beyond financial risk transfer to wider problems. It supports a joint initiative between industry and academia to develop an R&D programme for the repurposing of catastrophe modelling to address ‘physical climate risk’. The power of multi-disciplinary risk investigation is highly applicable to decision making in adaptation investment over long timescales, which in turn will create the conditions for new markets.

### 3. Progress to date

Since 2016 the RMSG has made good progress in the following workstreams:

**Development of the ‘strategic model paradigm’.** The RMSG is proposing a significantly scaled programme to build ‘strategic’ models and complementary data sets using the open framework platforms delivered by Theme 1. The defining characteristics of strategic models are that they must be sufficiently robust and interoperable that client users will choose to adopt them, trust them and sustain their use in the long term. Further detail is given in Theme 2 – Filling the gaps’ below.

**Building demand-led support of IDF pilot projects for models and data.** RMSG is supporting the data and modelling requirements for IDF pilot projects initiated in 2017 for Sri Lanka, Pakistan, Bangladesh and Vietnam. An initial review of existing models, mapping them to requirements for those projects and identifying gaps was conducted in 2017/early 2018. Following further solicitation at the political level with each of these countries, Sri Lanka and Pakistan have emerged as priorities in 2018. The projects will have both short-term and long-term elements, which may have different modelling requirements.

The Sri Lanka project seeks to improve exposure and claims management of the Sri Lankan National Natural Disaster Insurance Scheme (NNDIS) in an initial stage in 2018. The high-resolution exposure model will be developed using model expertise from within the IDF RMSG member companies and external consultants. The RMSG has initiated a short-term consulting project starting in July 2018 to kick this off.

**Understanding the problem space.** A continuous programme of research is under way to understand the requirements of discrete groups of non-insurance users in the DRR world, leveraging similar work in the UN ISDR GRAF programme. The aim is to define how relevant re/insurance catastrophe models might be adapted or developed for use by these groups. This workstream is strongly connected to the cataloguing workstream below.

**Catalogue hazard and vulnerability models.** Existing risk models and data are often not widely known about or accessible, meaning that research is duplicated and resources wasted. In June 2017 the RMSG launched [Catrisktools](#), the IDF online model availability catalogue on the Oasis Hub portal, providing an open access global directory of catastrophe risk assessment tools. The catalogue answers the question: “What models exist and where are they?”.

**Development of exposure data.** RMSG members are advising on the new multi-hazard database schema for global exposure data, being developed under the GFDRR-DFID Challenge Fund. This schema will operate with accompanying hazard and vulnerability components developed concurrently under the same project. The open-access database will be compatible with data of varying fidelity and scale, initially for scenario events.

## 4. Theme 1: Improvement of modelling infrastructure

### a. Strategy:

- i. Data is currently maintained in a wide variety of formats and systems, with no established standards for the easy transfer of data between platforms, models and systems. Many models can only be used on the platforms for which they were built, leading to well-known issues of duplication and inefficiency. In addition, models funded by public entities often remain proprietary to them and are not shared with others.
- ii. While an ensemble of diverse models is desirable for good risk understanding, the production of models covering the same peril-region using the same inputs and assumptions is wasteful and gives a misleading or incomplete view of uncertainty. The RMSG will stimulate interoperability of models and data on a range of platforms in order to achieve less waste, and (crucially) greater confidence in the results. We believe that this logic applies to all model platforms, public and private, and we are encouraged by recent conversations with commercial model vendors indicating willingness to engage on these topics. The RMSG will encourage non-industry model developers to do so using the interoperable model and data standards and approaches to enable re-use, broad availability and reduced duplication.

- iii. It is important to note that open source and open framework does not mean that all models and data need to be available at zero cost to all users. Some may pay and others have free access as desirable and appropriate.
- iv. In addition to broad interoperability of models and data, RMSG research with DRR actors such as UN ISDR and the InsuResilience Global Partnership, as well as and science research communities has found strong and consistent demand for an open source, free to use modelling platform. The only credible solution currently available is the private sector funded Oasis Loss Modelling Framework. The RMSG proposes to reinforce Oasis and its community to provide a common, open infrastructure for the global DRR community and industry to work together to develop capability in client countries. The (Re) Insurance industry will lead this effort as a major contribution both financially and physically to the overall IDF strategy.
- v. These strategic intentions will be executed through the workstreams below.

#### b. Workstream 1.1: Interoperability Project:

- i. **Scope:** The Interoperability Project addresses the challenge of enabling interchange of models and data sets between model platforms, in order to deliver **Transparency, Cost reduction** and **Accessibility**. The project starts with a forensic technical gap analysis, and (depending on recommendations) is anticipated to deliver software tools, communications, training and recommendations on future standards.
- ii. **Benefit:** The project makes an indispensable contribution towards the RMSG vision of widespread use of models, data and tools by a broad community of risk informed decision makers, starting with organisations relevant to the InsuResilience Global Partnership. The project should enable users to ‘own’ and develop their own risk understanding through verification, therefore increasing their breadth of analysis and trust in the results.
- iii. **Execution:** The project will take be executed in three work packages:
  1. **WP1: Analysis:** To present a forensic, technically credible gap analysis covering:
    - a. Business and technical barriers to interoperability in the current landscape of models, data architecture and platforms, as well as work already done in this area.
    - b. A technical description of a realistic and desirable future state of interoperability.
    - c. Evidence of the quantifiable and intangible business benefits of interoperability.
  2. **WP2: Delivery:** To deliver innovations that can feasibly be achieved by RMSG to overcome these barriers. These innovations may include

a software development project (for example an exposure data and results conversion toolset) and data architecture recommendations for new models, but they may also involve deliverables not yet discerned.

3. **WP3: Sustainability:** To lock in the gains made in interoperability for the long term, through identification and commitment of appropriate resource, governance and processes.

#### c. Workstream 1.2: Open platforms and standards

- i. Building on the Interoperability workstream above, The RMSG believes it is to the advantage of industry, client governments and IGOs to work towards open standards for data, and will work with all interested providers to help make that possible. In doing so it will build on work that has already been done in both public and private sectors. This includes significant work already underway in industry and also work done by WB/DfID and GEM and others to develop commonly agreed schema.
- ii. Additionally, there is strong demand among IGOs and client countries for an open source, free to use risk modelling platform. This is a key component of developing capability in risk understanding at sovereign and sub sovereign levels, and would enable long term cost effective modelling where it is most needed. The RMSG has concluded that **Oasis LMF** provides this capability and has the potential for much greater scale. This workstream will include measures to reinforce awareness and develop the widespread use of Oasis and its community linkages in addressing the protection gap.
- iii. In addition to furthering the development of the platform and ecosystem Industry has a role to play in the production of open models and data to standards consistent with this approach.

#### d. Workstream 1.3: Connection and advocacy across industry and public sector

- i. The RMSG establishes and grows connections across industry and public sector initiatives where advantages can be gained in opening up the risk modelling ecosystem. The RMSG will work to engage partners including industry actors, academic institutions, funding partners, government bodies, with advice from IGOs, NGOs and the London Centre for Disaster Protection to secure commitment to an outline proposition for the achievement of RMSG aims. Conversations continue with DFID, InsuResilience, IGOs, and potential academic partners and RMSG will continue to explore new opportunities with funders and partners.

- ii. In particular the RMSG is involved in development of the UN ISDR Global Risk Assessment Framework (GRAF) in 2018, which will supersede the previous Global Risk Model, with a 12 year strategic agenda leading up to 2030 to achieve Sendai and relevant SDG goals. The RMSG is an active participant in shaping the development of the GRAF given commonality in objectives in creating open risk models, linkages between academics, public science, industry and multiple end-users in the DRM and DRR worlds.

## 5. Theme 2: Models and data

### a. Strategy:

Theme 2 is all about development and accessibility of open models and data. It seeks to understand what models and data users need, it broadcasts knowledge about what is currently available, actively works to make that accessible to all (via interoperability) and aims to ‘fill the gaps’ where models and data are needed but don’t exist or cannot be made accessible.

### b. Workstream 2.1: Evolving the structure of the RMSG – a delivery network

- i. It has become clear that an RMSG ‘vehicle’ is required to deliver on this theme. It is proposed that a ‘Delivery network’ for open risk modelling should be created, as a major contribution to open modelling infrastructure for both public and private sectors. The network would initially address region-perils most relevant to the DRF ‘protection gap.’ The intention is co-development with national ministries, agencies, and private sector actors. Work would be in partnership with IGO/NGOs and private-public partnership initiatives such as the InsuResilience global partnership.
- ii. A Concept Note for the RMSG Delivery Network (Reference C) is now available. The Network’s purpose would be the achievement of RMSG strategic aims in:
  1. The production and commissioning of open ‘strategic’ models, *ad hoc* demand driven models and supporting modules (see Theme 2 below.)
  2. Capability development to support implementation of sovereign and sub-sovereign programmes.
  3. Continuous advocacy and facilitation of standards-based open risk modelling. This would be likely to include ‘ownership’ of the Interoperability Project for the long term.
- iii. The Delivery Network would connect the efforts of international partners. Leadership and senior expertise would be drawn from the catastrophe modelling community, located in one or more centre(s). London would provide one centre from the start, for proximity to the WB/DfID Centre for Global Disaster Protection and industry advocates; however the RMSG will seek engagement internationally and further centres would be possible

wherever sufficient potential ‘gravity’ is identified, either in regions or major donor countries.

### c. Workstream 2.2: Understand the problem space

- i. Risk modelling is used by many different stakeholders whose needs are not always understood outside the private sector. The goal of this workstream is to understand the needs of wider (non-insurance) user groups, to define how catastrophe models might be adapted to meet those needs, and to provide case studies of how decision makers can use model results in their decisions.

### d. Workstream 2.3: Catalogue existing models and data

- i. The IDF ‘Catrisktools’ catalogue was developed by the RMSG to answer the question “What models and data exist and where are they?” (See <https://catrisktools.oasishub.co.>) There are currently entries for 250 models and data sets. The focus for the next 6-12 months is to ensure model owners are able to maintain their catalogue records, and further promote awareness of the catalogue. During this period, the RMSG will facilitate the conversion of relevant probabilistic risk models into a format interoperable with the OASIS Loss Modelling Framework where possible.

### e. Workstream 2.4: Filling in the gaps

- i. This workstream addresses issues caused by ‘ad hoc’ modelling, which in the past has led to inefficiency due to duplication of effort for some peril-regions and lack of re-use. In other areas it has led to very poor model coverage.
- ii. A strategic model development programme using the open framework platform developed through Theme 1 workstreams. Strategic models will facilitate the rapid development of disaster risk financing and insurance mechanisms where they are most needed. Models will be commissioned or developed in-house by the delivery network, always to open standards. Outputs will be of sufficient quality to be used for re/insurance. ‘Strategic’ modelling will ensure that:
  - 1. The models are sustainable, particularly by local users i.e. the models can be maintained and updated with new data and research by people other than the original developers beyond the lifetime of funded projects;
  - 2. The models are co-developed with and have buy-in and trust from in-country stakeholders and experts;

3. The models are recognised as sufficiently robust for the international (re)insurance and risk transfer industry;
  4. The model development process does not duplicate or waste effort and resource but still produces a diversity of views as befits the reality of uncertainty;
  5. The model develops the capability in a broader set of organisations, to understand, develop and use catastrophe models independently;
  6. The model development is aligned with and furthers the interoperability agenda, so they are as accessible through as many platforms as possible to encourage widespread usage for and by disaster risk financing.
- iii. Delivery of demand driven models in the short term to fill current gaps in high priority regions and countries as driven for example by the InsuResilience Global Partnership, and in response to bespoke proprietary requests from the commercial sector.

## 6. Resourcing

- a. An estimate of resourcing requirements for Themes 1 and 2 will be published shortly, including the 'ask' for both industry and public contribution to this effort. The most significant resource requirements are for the Interoperability Project and the Delivery Network/Centre. Having researched stakeholder priorities, the RMSG intends to secure a combination of public funding and industry support (both financial and in-kind) for the creation of the Delivery Network, which will become self-sustaining in a relatively short period of time (3-5 years). It is said that 'models make markets' and the incentive for industry contribution is the double benefit of cost efficiency and new market opportunity.
- b. Long term funding for the network would be through a mix of sources including IGO/NGO tenders (for example from the WB Centre for Global Disaster Protection), open-calls for research grants, consulting income and industry contracts. Details are shown in Reference C, showing a 3-5 year funding mix building to an annual target of £4.5-5.5m. The network will leverage existing work and funding as much as possible - it is the RMSG's view that there is already enough money in the system, and that by reducing inefficiency and redundant work significant progress can be made in achieving the objectives defined above.
- c. By ensuring that the data and models produced by the delivery network are openly accessible, the network will deliver valuable risk information for the public good and align with objectives of the InsuResilience Global Partnership, the IDF and public funders. The co-development of risk data and models with client countries will increase trust in the output among all stakeholders, creating the conditions for .
- d. Resource requirements for the Interoperability Project are estimated in Reference B (the Interoperability Project Plan.)

## 7. Next Steps

**a. Next steps for RMSG overall:**

- i. Proposal of this RMSG Strategy update to the IDF Steering Committee. *(Approved in Sept 18)*
- ii. Reinforcement of the RMSG Steering Committee. *(Achieved 26 Sept 18)*
- iii. Agreement and publication of resourcing needs (private and public sector.)

**b. Next steps for Theme 1 (Modelling Infrastructure) are:**

- i. Cross-industry engagement to secure support for the principle workstreams.
- ii. Publication of the Interoperability Project Plan and the identification of resource to start work.
- iii. Recruitment of the Interoperability Working Group (ITWG).

**c. Next steps for Theme 2 (Models and data) are:**

- i. Distribution of the Delivery Network/Centre concept note, followed by stakeholder meetings to assess and engage interest.
- ii. Research and engagement with public sector and philanthropic funders.
- iii. Completion of the toolkit for the CatRiskTools web portal.
- iv. Continued work on current demand-driven pilot projects.
- v. Investigation of a potential global exposure data project.