

Risk Modelling
Steering Group

Strategy: 2022 update

Public-private collaboration in
risk analytics to close the
protection gap



Risk Modelling Steering Group – Strategy paper update (Jan 2022)

References:

- A. **Development Impact of Risk Analytics report (October 2020)**
- B. **IDF-Oasis Phase 2 Project Initiation Document v3.0 (December 2021)**
- C. **RMSG Standards and Best Practices document v2.0 (December 2021)**

1. The RMSG in 2021

- a. The Risk Modelling Steering Group (RMSG) is an expert working group of the Insurance Development Forum¹ (IDF.) It is international in nature and its 70+ participants are drawn from the insurance industry, vendor modelling organisations, IGOs, NGOs and the scientific research community. It is led by private sector and UN co-chairs and sub-groups are formed by willing volunteers for execution of specific workstreams.
- b. The RMSG exists to provide a portal to private sector risk analytics capability in support of the UN Sustainable Development Goals. While this capability originated in the quantification of risk arising from single geo-physical and hydrometeorological hazards, it can (and should) also be used to develop strategies in the context of multiple hazards and a changing climate.
- c. 2021 was absolutely a landmark year for the IDF’s risk modelling programme. At CoP26 (in November 2021) the IDF signed an agreement with the V20 group of finance ministries of 55 climate-vulnerable countries, calling for “Public-private partnership in risk and resilience analytics”. The agreement followed RMSG’s call to action campaign, and its [‘Development Impact of Risk Analytics’](#) report (Reference A). It paved the way for the proposed **Global Risk Modelling Alliance**, a programme designed to create local capability using insurance risk methodologies in countries where the need is greatest. Shortly afterwards the German government intimated that it would provide initial funding support of €11m to get the programme started in 2022.
- d. Meanwhile, during 2021 IDF Steering Committee and other industry members strengthened their support for the vision and strategic aims of the RMSG. Seven companies² committed funds to RMSG’s programme through MoUs, and many more contributed in-kind support. Much of this enabled great strides forward in the development of the Oasis open-source risk modelling platform, the Open Data Standards suite it curates, and transformation tools to create interoperability between leading data formats. This support led to the completion of Phase 1 of the IDF-Oasis development programme, which delivered very significant improvements in usability and performance that will be helpful to future public-sector users. Phase 2 is now under way and is described later in this document.

¹The 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.

² AIG Re, Aon, AXA Group, Axis, Munich Re, RenaissanceRe and SCOR

2. Vision and strategic priorities

a. The RMSG is dedicated to improving global understanding and quantification of natural hazards disaster risk, through sharing of the re/insurance sector’s experience, tools and methodologies. Risk literate users in vulnerable countries should be able to access the models and datasets best suited to their risk questions, use them on their preferred platform, develop them further and have trust in the results. The benefits will include:

- i. Improved risk ownership, accountability and reporting. Many international agreements require countries to analyse, plan and report their risk, but in many cases the domestic capability is unable to match the need.
- ii. Reduced uncertainty in risk strategy formulation and operational decision-making.
- iii. Common tools and a shared language of risk connecting the private sector, governments, development agencies and academia. This can only be beneficial for market-building and economic development.
- iv. Reduction of duplication and inefficiency in the risk modelling supply chain for development programmes, which is largely funded by taxpayers.

b. The outcome of RMSG’s work with its members and partners should be the modelling ecosystem shown at **Annex A**. To achieve this, RMSG’s strategic priorities and workstreams are grouped under the following two themes:

c. **Theme 1 Vision: Open modelling technology and standards:** The current supply of risk metrics in international development is characterised by a wide variety of formats and systems, with no established standards for the easy transfer of data between platforms, models and systems. Model assumptions are opaque and many models can only be used on the proprietary platforms for which they were built, leading to well-known issues of duplication, cost and inefficiency. The net result is that there is no lasting transfer of risk understanding to decision-makers.

RMSG’s vision is that sub/sovereigns and their agencies wishing to develop their own finance-aware risk analytics functions can access the open-source technology and standards they need to develop their own view of risk³. Availability of a foundational open-source platform and widely accepted data standards will remove the barriers of cost and complexity, and increase choice and transparency.

d. **Theme 2 Vision: Delivery of content and sub/sovereign capability:** The enabling technology in **Theme 1** only adds value if relevant models and data are also available, along with the knowledge to use them. The **Theme 2** vision is that risk owners in vulnerable countries gain sufficient insight to develop their own risk functions, can construct a layered risk strategy, and can develop the risk information to execute it operationally. A key point is the build out and integration of local data and research in the models, which in many cases is likely to improve model results and will certainly approve model acceptability⁴.

This will clearly require the development of local capability in certain contexts. RMSG

³ For a full justification of the logic behind this vision see Reference A.

⁴ Amongst other sources, this point was emphatically reinforced by FSD Africa in late 2020.

proposes the **Global Risk Modelling Alliance** as a service to support vulnerable countries in development of this capability.

3. Theme 1: Open modelling technology and standards

a. Strategy:

- i. RMSG will catalyse the optimisation and adoption of open-source risk modelling platforms⁵ and related modelling standards across sub/sovereign governments and the development community that supports them.
- ii. During 2020 RMSG formally selected the Oasis Loss Modelling Framework (from here on referred to as Oasis) for the purpose. The benefits of this selection are summarised in Box 1 below.

Box 1: Rationale for the selection of Oasis:

1. A stable open-source software platform providing a simulation engine designed for probabilistic as well as deterministic modelling and able to incorporate catastrophe models from around the world.
2. Re/insurance grade modelling capability. In addition to the core software Oasis includes a standards-based open-source financial module covering the financial contract terms that are so critical for operational transactions.
3. A non-competitive, non-profit position with wide market support. For example, Oasis’ open-source software is at the core of ‘Software as a Service’ platform providers such as Nasdaq and QOMPLX, as well as the model service offering from Xceedance. Many vendor modellers, brokers and non-profit partners already format models to Oasis standards and the number is growing.
4. Oasis curates a suite of widely accepted standards, known as Open Data Standards (ODS), including Open Exposure Data and Open Results Data (OED and ORD) standards, as well as standards in representation of hazard, vulnerability and financial metrics.
5. A set of functional tools including model development kits and APIs, enabling the conversion of models to a standard format.
6. A range of scalable deployment options from ‘out of the box’ use by small teams up to customisable enterprise use.

- iii. RMSG’s strategy requires optimisation of the technology and standards for use in the development environment. This gives rise to the following workstreams:

⁵ For clarity, ‘Open-source platform’ does not mean that all models and data on the platform are necessarily open. In practice there is a mix. Public good licences will be preferable where programmes are for the benefit of sub/sovereigns working towards UN SDGs, but the value of Intellectual Property will also be protected wherever commercial terms are appropriate. This will help to ensure the sustainability of any public-private programme beyond a publicly funded period.

b. Workstream 1.1: Oasis platform development for public sector and humanitarian use

- i. **Context:** In Phase 1 of the IDF-Oasis development programme (January-June 2021) the IDF helped to fund developments in usability and performance of the Oasis Loss Modelling Framework. This was done in collaboration with the 'G10' group of companies and, although industry-funded, the outcome was of potential benefit to all sectors.

Phase 2 of the programme, to be executed in 2022, is purposed solely for the benefit of public sector and humanitarian use cases. It is defined at Reference B and includes:

1. Development of an entry-level risk modelling tool to accelerate the adoption of insurance methodologies for the pricing of risk. The rationale for this tool is that there is plenty of technical talent in vulnerable countries, but not necessarily much experience of using full catastrophe risk models. Following multiple consultations we have developed ToRs for a tool that could be used by GIS capable staff, using the Hazard x Exposure x Vulnerability construct with an actuarial engine to ensure the ability to price risk. This will make the tool suitable for a wide variety of investment and risk transfer applications, not least parametric insurance.
 2. A feasibility study for the improvement of vulnerability functions and use of fragility curves in the Oasis modelling system. This will not only be for impacts on property but also for infrastructure and human impacts, making it highly relevant for public sector and humanitarian use.
- ii. **Current progress and objectives for 2022:** *These workstreams are defined in more detail at Reference B. Release of funds for the purpose (originally contributed by IDF member companies) was approved by the IDF Secretary General and Chair of the Operations Committee in December 2021. A kick-off meeting was held at the beginning of January with a view to project commencement by the end of the month.*

c. Workstream 1.2: Open data standards

- i. **Context:** As described in detail in Reference A, adoption of agreed open risk data standards for data and model interoperability will increase knowledge exchange between private, public, humanitarian and academic participants, and increase choice by making models deployable on users' preferred platforms. RMSG supports the view of the 2020 Open Modelling Collaboration/G10 group, and also the US-based Catastrophe Modelling Operating Standards (CMOS) / Helix initiative under the banner of The

Institutes, that the Open Exposure Data (OED) and Open Results Data (ORD) standards should be adopted as the default for use not only across industry but across all sectors.

ii. **Current progress and objectives for 2022:**

Having integrated human exposure into OED v2 in 2021 in collaboration with Oasis, we will turn our attention to developing capabilities for handling public infrastructure exposure data in 2022.

This work will benefit from input of RMSG members’ knowledge on risk analytics for public infrastructure, so a working group will be established. Importantly, we will seek to maintain interoperability of infrastructure exposure data with the public sector (Risk Data Standards, via GEM and GFDRR), and the GRIL.

This added capability of OED will continue to enhance the ability of models in Oasis to respond to public sector risk analytics requirements.

d. **Workstream 1.3: Interoperability**

- i. **Context:** RMSG’s Interoperability Technical Working Group (ITWG) addresses the technical challenge of interchange of existing models and data sets between platforms, reducing the cumbersome manual intervention currently required to compare or share analytics. In 2019-20 the ITWG made excellent progress with the release of the CEDE/OED transformation proof-of-concept, and moved on to subsequent work on model agnostic transformation. In 2021, a smaller steering committee was established to drive the direction of the *Open Data Transformation Framework (ODTF)*. This steering committee has focussed on having catastrophe analysts test the proof-of-concept, improving its practical usability and providing validation of transformations. The steering committee has also spent time in dialogue with RMS about greater cooperation on open exposure data transformations, which have unfortunately been unsuccessful to date.

Current progress and objectives for 2022:

We have completed development of the next version of the Open Data Transformation Framework in January 2022, which improves ease of use and documentation. This supports a more rigorous and coordinated testing phase with a larger community of catastrophe analysts, and promotion of its capabilities to analysts in the US market, which we have not attempted previously. This is being driven by the ODTF Steering Committee, which has met monthly through 2021 and comprises representatives of RenaissanceRe, Chubb, SCOR, Aon, Guy Carpenter, AIR-Worldwide, and Oasis LMF. The US-based Climate Resiliency Council are also now represented in the steering committee (CRC, affiliated with The Institutes, and a product of discussions in the CMOS Initiative).

The IDF and CRC are coordinating a series of workshops in Q1 2022 to demonstrate the ODTF to US market analysts and engage them in testing, use, and development of the framework. This works towards the objective for 2022 of establishing a larger community of users and developers around this framework, to boost its capabilities and operational adoption.

e. **Workstream 1.4: Collaboration on further standards**

- i. **Context:** The RMSG establishes and grows connections across industry and public sector initiatives with similar objectives in promoting open risk modelling technology and modelling standards.
- ii. **Current progress and objectives for 2022:**
 - 1. **Catastrophe Modelling Operating Standards / CRC:** *The RMSG and CRC have developed a strong and growing partnership on standards, coordinating primarily via the Interoperability workstream and ODTF steering committee. Together we will host a series of workshops on the ODTF in Q1 2022 in an effort to expand the community around this tool and promote the efficiency gains from an open data transformation toolkit. This work is a pleasing continuation of the cooperation between RMSG and the CMOS Initiative which developed through 2020 and into 2021.*
 - 2. **World Bank Risk Data Library:** *In 2021 under Workstream 1.3: Interoperability, ITWG established a beta version of an exposure data transformation between WB’s Risk Data Library (RDL) and OED, establishing a link between OED and a development-sector schema in which an increasing amount of World Bank risk data will be held in their public Data Catalogue (<https://datacatalog.worldbank.org/search/collections/Risk-Data-Library>). GFDRR Risk Data Library project has received funding from SwissRe Foundation to improve risk data standards and apply them in operational projects, via a cohort of RDL Fellows in six countries. Where possible RMSG and GFDRR will look to collaborate on risk data standards and analytics where GRMA is working in the same countries as GFDRR RDL Fellows.*
 - 3. **UN GRAF:** *In 2020 some RMSG members supported development of the UN Global Risk Assessment Framework (GRAF), which was launched by DRR in May. The GRAF superseded the previous Global Risk Model, with a 12-year strategic agenda leading up to 2030 to achieve Sendai and relevant SDG goals. The RMSG was previously a 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.

Following a change in leadership of the GRAF programme in 2021, work has concentrated on building relationships and applied approaches with a small number of countries – this list will be a factor in selection of partner countries in the GRMA programme.

4. Theme 2: Delivery of content and sub/sovereign capability

a. Strategy:

- i. **Theme 2** is about making knowledge and resource available to sub/sovereigns and their partner agencies to assist finance-aware strategic risk planning, operational decision-making and market development. This implies both the availability of model/data content and capacity building. The rationale and evidence supporting this case, including a Theory of Change, is presented in detail in the [Development Impact of Risk Analytics](#) report (**Reference A**).
- ii. The goal is a funded programme and roadmap of project work agreed between donors, partner countries and the IDF to be executed by a public-private partnership entity, to be known as the **Global Risk Modelling Alliance** (GRMA). The components and services of the GRMA are shown at Workstream 2.1 below.
- iii. RMSG is not operating in isolation and will work with other initiatives and opportunities that are consistent with the aims of **Theme 2**. These include:
 1. Support to **Tripartite Agreement** operational projects.
 2. Support to **UNDP**'s rollout of risk assessment as a key component of Integrated National Financing Frameworks (INFFs).
 3. Support to the **Centre for Disaster Protection**'s Global Crisis Risk Initiative
 4. Work with the UK's recently announced **Centre for Greening Finance and Investment**, particularly on the **Global Resilience Index Initiative** (see below).

b. Workstream 2.1: The Global Risk Modelling Alliance

- i. **Context:** The logic for the GRMA entity is laid out in detail in **Reference A**, and was supported by a range of briefs specifically prepared for the V20 Group of Minister of Finance and for BMZ. The latter detailed the important role that the GRMA will play in achievement of the objectives of [InsuResilience Vision 2025](#).

- ii. As mentioned in the introduction, at the end of 2021 two very welcome developments ensured that the GRMA will become a reality in 2022:
 1. An agreement signed at CoP26 between the IDF and the V20 Group of Ministers of Finance for ‘public-private partnership in risk and resilience analytics’. This delivers political support and connection to key government departments, a key first step.
 2. Confirmation from the German government of at least €10m in funding to launch the programme.

- iii. The ambition for 2022 is to initiate the programme in 4-6 countries. An advocacy programme will also seek to engage further international (G7 or G20) donors’ interest so that the programme can be scaled up. The eventual ambition could be to have programmes completed or under way in 20 countries by 2026.

- iv. The rationale and principal components of the GRMA are summarised in the graphics below:

What’s the problem?

Risk analysis is critical to climate and disaster risk strategy:

- Investment in resilient infrastructure
- Contingent risk finance
- Market development

But access to risk analytics is unequal:

- Most model platforms and metrics are expensive
- Proprietary formats prevent sharing
- Uncertainties are hidden
- Local research is not sufficiently used
- Public and private sector views are separated

A solution is required to democratise risk understanding





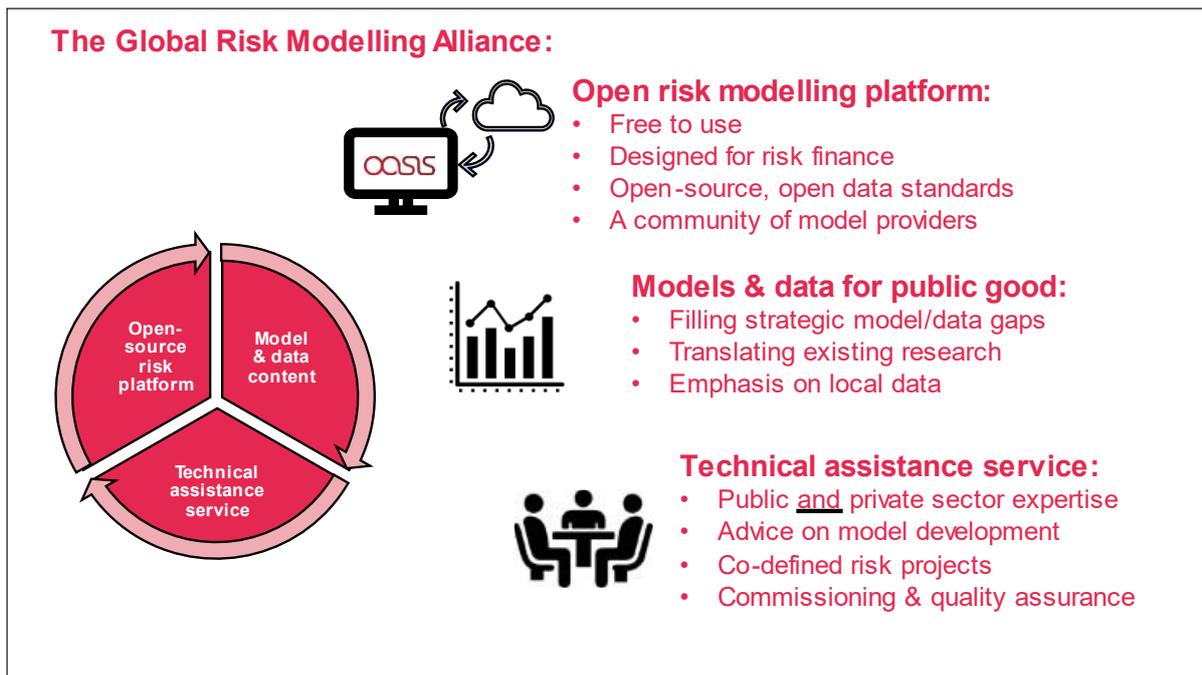


Figure 1: Introduction to the Global Risk Modelling Alliance

- v. As shown in **Figure 1**, the GRMA programme consists of three elements. The current status of each element is:
1. **Open risk modelling platform:** Investment in optimising open modelling infrastructure for public sector and humanitarian use is covered by the IDF’s investment in Oasis software, the open data standards it curates, and in tools to enable interoperability between data formats. These investments, funded by IDF member companies, were described in the previous section under ‘Theme 1: Open Modelling Platform and Standards’.
 2. **Filling Model and Data Gaps:** The GRMA practitioner team (see below) will assist countries in identifying critical model and data needs. Once defined, the work will then be offered to model/data consortia through InsuResilience Solutions Fund processes. The majority of the German government’s funding will be reserved for this purpose, and wherever possible local data and research will be included as part of the solution.
 3. **GRMA practitioner team:** The hallmark of this team is the experience of its practitioners in using insurance modelling approaches for strategic risk insight and unlocking disaster risk finance. Experts will be drawn from the catastrophe modelling community across public and private sectors and employed on a consultancy basis.

Services provided by the GRMA would include:

- a. Assistance to countries in developing a strategic risk audit.
 - b. Guided by the audit, assistance to countries in operational analysis of their priority risks to improve access to operational finance transactions.
 - c. Countries will build capability through co-development of these projects, on a ‘learn by doing’ basis. The GRMA’s supporting services will include:
 - i. Model gap and user needs analysis.
 - ii. Facilitating (through the ISF) the commissioning and quality assurance of new models/data where the market is not meeting the need, ensuring use of the Oasis platform and open data standards.
 - iii. Translation of existing models to Oasis format, using local data and research wherever possible.
 - iv. Quality assurance.
 - v. Assessment of sub/sovereign risk analytics capabilities in the context of the risks they face - and consultancy on a development pathway.
 - d. Advocacy and education to encourage widespread adoption of open risk modelling technology, standards and practices.
- vi. **Current progress and objectives for 2022:** *BMZ and KfW have asked the InsuResilience Solutions Fund (ISF) team and Frankfurt Business School to prepare a proposal for the launch of the GRMA. At the time of writing discussions are under way between IDF and ISF to ensure that governance and operational aspects of the programme remain as faithful as possible to the original concept.*

At the same time, the IDF will intensify conversations with V20 countries to establish an initial pipeline – this may partly be driven by the results of a demand-side survey currently in progress.

Timing of the GRMA’s launch has yet to be determined, as the new German government is still in transition.

c. Workstream 2.2: Support to Tripartite Agreement projects

- i. **Context:** Tripartite Agreement consortia have now formed for operational work in 12 countries⁶. The assumption is that companies will wish to use their internal analytics capability for risk modelling or will outsource to third party model vendors and developers. RMSG has no intention of offering any duplicating or substitute services.

⁶ At the time of writing projects are in progress in Peru and Colombia, funding has been approved for projects in Ghana and Mexico and concept notes have been submitted for Bangladesh, Nigeria and Algeria. A feasibility study is under way for Uzbekistan and consortia have been confirmed for projects in Argentina, Colombia (#2), Jordan, Thailand and Vietnam. Countries currently on hold are Pakistan, Philippines and Sri Lanka.

However, it is important that the standards and best practices advocated by the IDF are upheld in country projects, and that RMSG offers complementary services where they would be helpful.

- ii. **Current progress and objectives for 2022:** *RMSG will support project consortia in moving from planning to operations in two areas:*
 - 1. **Standards:** *A ‘Standards and Best Practices’ document (**Reference C**) has been agreed between the leadership of the working groups and has been distributed to consortia.*
 - 2. **Services:** *A proposal for RMSG services to Tripartite projects has been shared with consortia. It centres on sub/sovereign capacity development services, which may be important to partner countries but may not be a key objective of companies’ catastrophe modelling teams. At the time of writing no consortia have requested these services, but we are still at an early stage in the programme.*

d. Workstream 2.3: Global Resilience Index Initiative

- i. The IDF is one of the quartet of founding organisations behind the Global Resilience Index Initiative (GRII), alongside the Coalition for Climate Resilient Investment (CCRI), the Coalition for Disaster Resilient Infrastructure (CDRI) and the UK Centre for Greening Finance and Investment (CGFI).
- ii. The GRII is an ambitious modelling programme delivering metrics to support physical climate risk scenarios, stress testing and analysis for exposed communities, markets and assets worldwide. Launched as a public good, the GRII will provide a reference index for the comparison and valuation of aggregated risk on a globally consistent level. In the way that progress in climate mitigation is measured in tonnes of CO₂, the GRII could deliver the *lingua franca* for measuring progress in adaptation and resilience.
- iii. A graphic summarising the GRII’s approach is shown at **Annex B**. The relevance to RMSG’s programme is clear; the GRII will be a useful resource in accelerating the spread of physical climate risk analysis, particularly at a strategic, portfolio level. There are links to the work of the GRMA in strategic risk auditing/profiling at sovereign level, and to the development of the entry-level risk modelling tool. RMSG will ensure that GRII content will be formatted and accessible for users of the Oasis ecosystem.
- iv. The GRII was announced in the margins of CoP26, under the patronage of Mark Carney (UN Special Envoy for Climate and Finance), Mami Mizutori (Special Representative of the UN Secretary General for Disaster Risk Reduction) and Eric Anderson (President, Aon).
- v. Building on the concepts advanced by the UN’s Global Assessment Report 2017 (GAR17) the GRII will enable users to assess the benefit of investment in resilience in the face of multiple hazards. Importantly it will cover impacts

beyond the built environment - the plan includes metrics for infrastructure damage, social impacts, economic loss and potentially natural capital. The vision is that its metrics will help communities and markets across the planet turn to green and resilient finance solutions to build a more resilient world.

e. **Workstream 2.4: Support to further key partnerships**

- i. A number of IDF partner/member organisations are interested in the potential of RMSG’s programme to create country capability in finance-aware risk understanding, at both strategic and operational levels. Key current conversations include:
- ii. **InsuResilience Global Partnership (IGP):** The IDF works in constant and close partnership with the IGP, mainly through the InsuResilience Secretariat. RMSG engages with the IGP’s data programme and will support multiple IGP events in 2022, not least the Annual Forum.
- iii. **UN Office for Disaster Risk Reduction (UNDRR):**
In 2020 UNDRR has been a much-appreciated advocate of RMSG’s programme, through contribution to the DIRA paper and the subsequent call to action, and of course through co-chairing the RMSG. The working group will continue to provide expertise to UNDRR programmes such as development of the Global Risk Assessment Framework (GRAF) and stands ready to assist in its country pilot programmes if required.
- iv. **UNDP Insurance and Risk Financing team:** UNDP is a key partner and facilitator in Tripartite Agreement projects, but also has wider ambitions for capacity building in Tripartite and other countries. The GRMA would be an excellent mechanism to support this work; UNDP’s support will be invaluable in conversations with donors as we seek to resource the programme. Programmatic areas include:
 - 1. Building a permanent risk surveillance capability as a component of Integrated National Financing Frameworks. This programme includes
 - 2. Assisting countries with an assessment of systemic/compound risk in the context of future pandemic. This project should provide metrics demonstrating systemic weak points, impacts on inequality and more. It should connect with multiple related initiatives on greening finance, which include the **Coalition for Climate Resilient Infrastructure**, the UK’s new **Centre for Greening Finance and Investment** and the **Centre for Disaster Protection** proposal to the G7 for a **Global Crisis Risk Outlook**.
- v. **World Bank Group**
 - 1. In late 2021 a series of meetings at senior IDF levels led to an intention to create stronger links between IDF and World Bank Group (WBG) programmes. For RMSG this meant looking for opportunities to collaborate more closely with practitioners in the

Global Facility for Disaster Reduction and Recovery (GFDRR) and the Climate and Disaster Risk Finance and Insurance (CDRFI) groups.

2. Potential areas of collaboration identified so far include:
 - a. Support to WBG’s Country Climate Development Reports (CCDRs)
 - b. Connection to country-level public sector user insight to support Oasis development.
 - c. Continued convergence of the open exposure data formats used in the (private sector) Open Data Suite and (public sector) Risk Data Library. This work is described in RMSG Theme 1 above.
 - d. At the time of writing a joint WB/IDF study is being planned to define the optimum model solution for unlocking finance in a data-poor region. The study will use Flood in Nepal as a case study but its findings should have very wide application to Disaster Risk Financing across south Asia and beyond.

vi. **Humanitarian partnerships:**

1. Start Financing Facility (SFF): Development of the SFF capital model, identification of models/data for target country/perils.
2. Support progress of IDF project support to UN OCHA, led by WTW and SHS working group.
3. Participation in Risk-informed Early Action Partnership (REAP) events and support to REAP’s programme development.

vii. **Global delivery partnerships:** RMSG is a network and its delivery programmes could not possibly be achieved without partnership. The Global Earthquake Model (GEM) is an excellent potential partner in delivery, and brings years of experience of working at country level. GEM Foundation is ready to partner with the GRMA to make its earthquake risk models, tools and exposure and vulnerability models available for application to financial risk modelling applications, and to partner in capacity building projects in developing countries.

1. Through its global public-private partnership between government institutions and private companies GEM has developed global coverage of earthquake hazard and risk⁷ ⁸. GEM’s ground-up loss models, modelling tools and datasets are available for free under an open license or upon request for public-good applications.
2. Since 2020 GEM has started to make its models more readily available for financial risk/insurance purposes and has increasingly formatted its output for use on Oasis LMF.
3. GEM will work with the GRMA to leverage its global network of collaboration and modelling capability with developing countries to

⁷ <https://www.nature.com/articles/d41586-018-07705-2>

⁸ https://journals.sagepub.com/topic/collections-eqs/eqs-1-GEM_supplement/eqs

continue to build hazard and risk assessment capabilities for a wide range of disaster risk reduction applications.

f. **Workstream 2.4: Catalogue existing models and data**

- i. The IDF ‘CatRiskTools’ catalogue on the OasisHub web portal 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 showing metadata for 250 models and data sets. Although a powerful resource, CatRiskTools remained static in 2019-21 because of lack of resource.
- ii. **Current progress and objectives for 2021:** *The focus in 2022 is to revise the operating model of CatRiskTools – to refresh its mandate and scope given changes in the risk analytics space since its original launch. The first priority will be to review its objectives and to plan a redeployment based on the outcomes of that, which would also include an adequate data curation and maintenance plan, and an updated catalogue of models.*

5. Resourcing

- a. Table 1 describes RMSG’s 2022 funding picture:

Secured private sector funding	
WTW 2022 contribution	\$100k (tbc)
Company contributions under MoUs with IDF:	
Year 1: (Paid in 2021)	\$700k
Year 2: (to be invoiced in 2022)	\$600k
Tripartite Agreement project work	Per project
Public sector funding (from BMZ, timing to be confirmed)	
GRMA: start-up and operational cost	\$1.0m
GRMA risk analytics assistance fund	\$10.0m
Other	
Potential for further G7/G20 donors to join programme	Unknown
RMSG <i>ad hoc</i> country project funding	<\$100k pa

- b. Long-term sustainable income generation:
 - i. Commercial income based on the value of IP created. While the primary purpose of the GRMA is public good, that does not mean that model and data licences would be free to everyone. Countries may receive public good licences but the IDF SteerCo is keen for the value of IP to be realised in transactions with non-contributing private sector companies. The mechanism for this IP value recovery would be a matter for discussion with donor partners.
 - ii. Open calls for research grants, consulting income and industry contracts.

c. Bids for public funding led by private sector networks require evidence of industry contribution, in the range of 20% up to 50% depending on the source. The IDF can already demonstrate a major contribution in the money committed to date and in the future, as well as the time spent on IDF work programmes by industry professionals. Even more significantly the industry can point to the collective investment made by the industry in development and continued funding of the Oasis LMF open platform.

6. Summary of next steps

- a. Next steps for **RMSG overall**:
 - i. Continuous connection of RMSG’s workstreams with the programmes of other IDF working groups, with emphasis on joint work in selected countries.
 - ii. Support to IDF events and representation of IDF in external fora where risk understanding is a major theme (eg REAP).
 - iii. Introduce RMSG’s strategy to recently joined private sector members of the IDF Steering Committee, with a view to signing Memoranda of Understanding.
 - iv. Continuous support to key partner programmes as shown at Workstreams 2.2, 2.3 and 2.4.

- b. Next steps for **Theme 1 (Open modelling technology and standards)** are:
 - i. Facilitate public sector and humanitarian input to definition and governance of the Oasis technical improvement programme and related standards. (Including input from Start Network, ADB, GFDRR...).
 - ii. Facilitation of IDF project funding from RMSG account.
 - iii. Continue work of ITWG steering group to deliver transformation tools. The roadmap will plot model-pair projects, ensuring consistency of priorities and investment between US and European initiatives.
 - iv. Continued development of the OED standard, in conjunction with GFDRR and the Risk Data Library.

- c. Next steps for **Theme 2 (Delivery of content and capability)** are:
 - i. **GRMA**:
 - 1. Definition of governance and administrative arrangements
 - 2. Advocacy with V20 governments and generation of a project roadmap
 - 3. Operational launch
 - 4. Advocacy with further donors to bring the programme to scale
 - ii. Support to the **Global Resilience Index Initiative**, through:
 - 1. Connection to insurance industry models and data.
 - 2. Advocacy and guidance on use of Oasis and Open Data Standards.
 - 3. Connection to the GRMA programme.
 - 4. Provision of Secretariat services.
 - iii. Development and management of *ad hoc* projects outwith the BMZ funding programme. Continued work on current demand-driven pilot projects (Peru, Indonesia.)

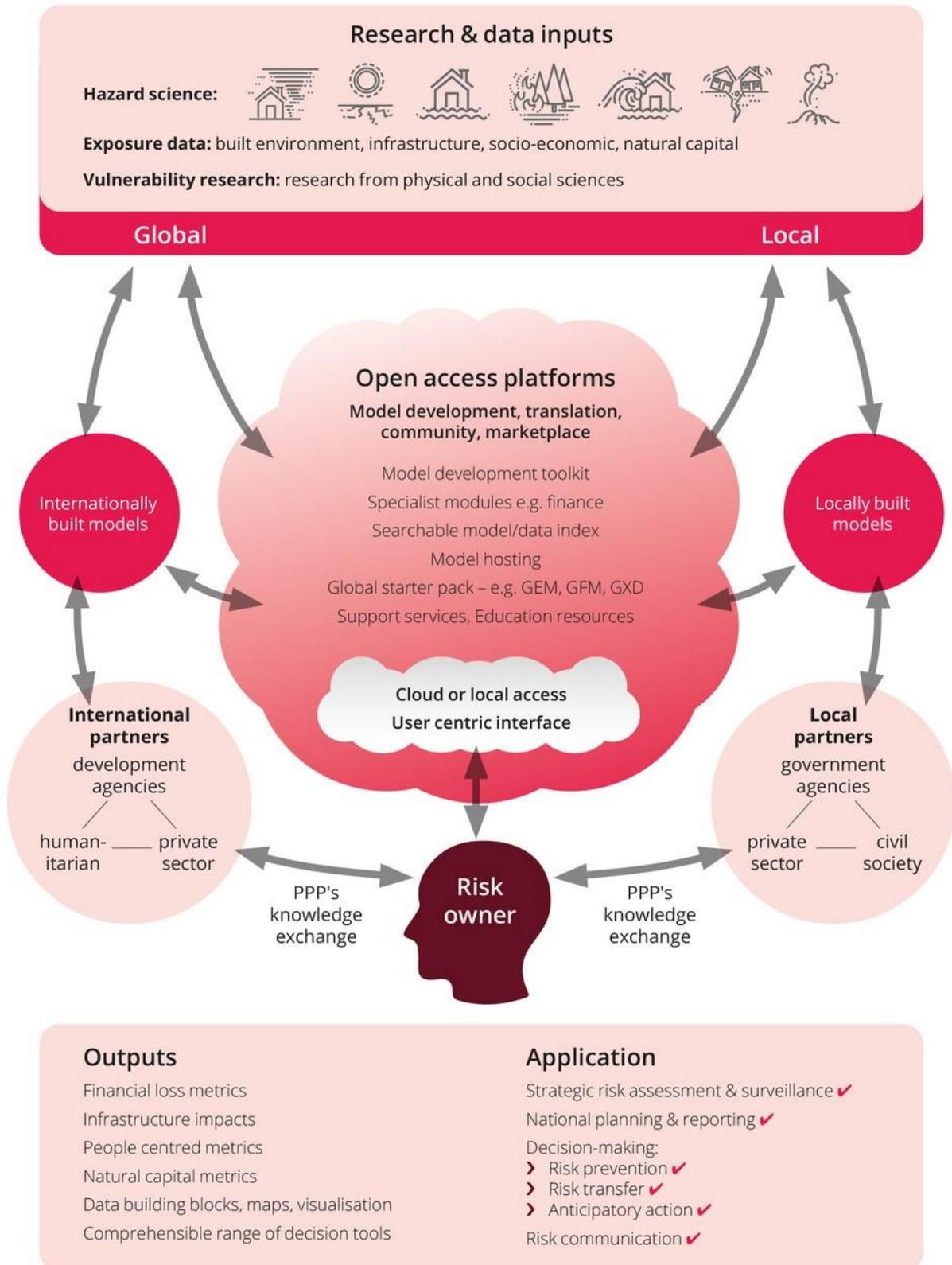
- iv. Tripartite agreement:
 - 1. Reinforcement of Standards and Best Practices with consortia member companies and their partners.
 - 2. Agreement of RMSG services with consortia and confirmation in project plans submitted to ISF.
- v. Support to scoping and delivery of UNDP country programmes beyond Tripartite Agreement, as shown in Workstream 2.4.
- vi. Support to humanitarian sector programmes. The most advanced engagement will most likely remain with the Start Network.
- vii. Scoping of a long-term projects of potential global benefit, including vulnerability research
- viii. CatRiskTools: Functional enhancements, improving updating process, addition of further models to catalogue, promotion of this resource to partners.

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Annex A:

Optimised open risk modelling ecosystem in the development context

(From the IDF Development Impact of Risk Analytics report)



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Annex B:
Summary of the Global Resilience Index Initiative

