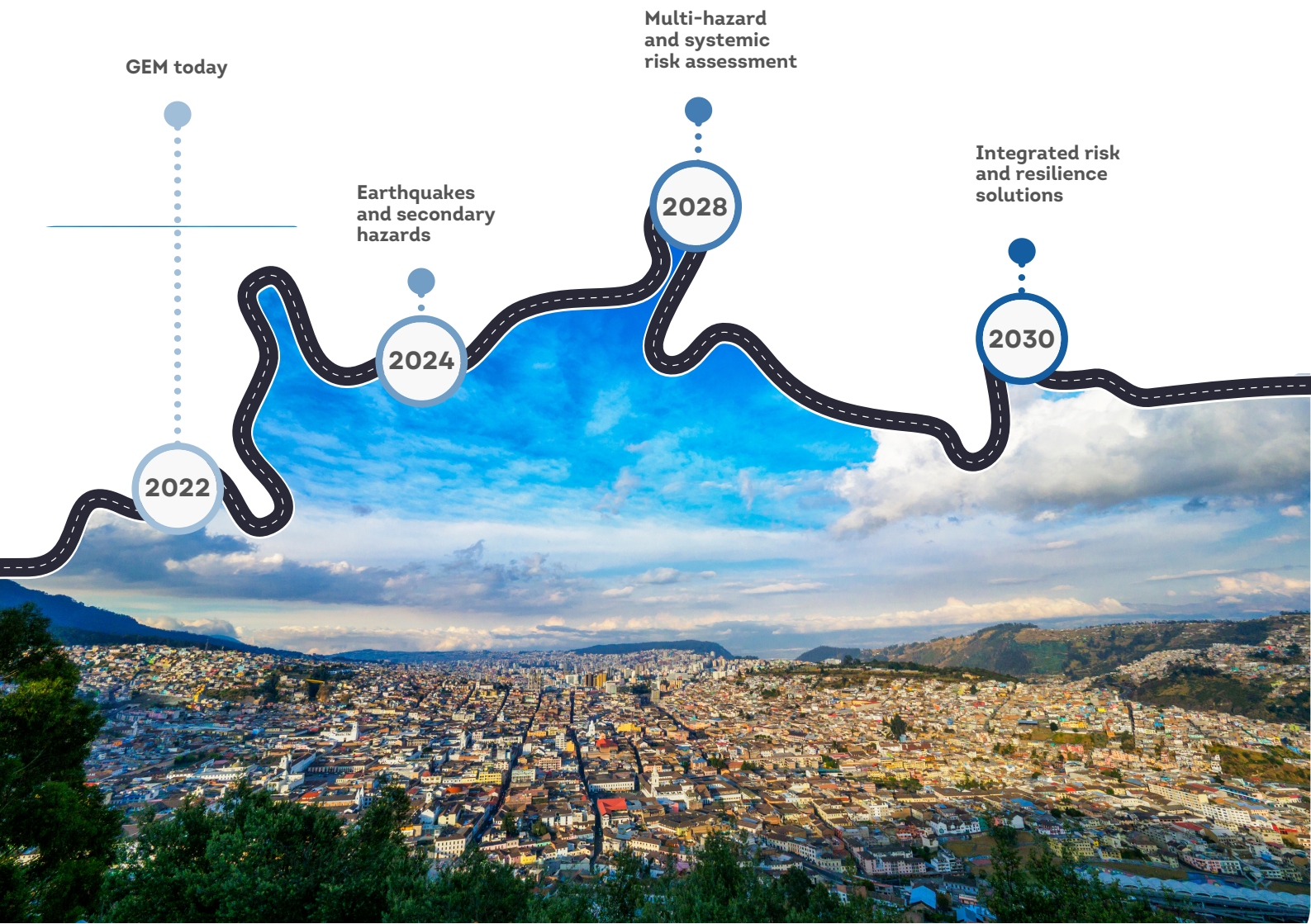


# GLOBAL EARTHQUAKE MODEL FOUNDATION

## STRATEGIC PLAN AND ROADMAP TO 2030

What role will GEM play as the risk landscape and associated demand evolve between now and 2030?



# GEM FOUNDATION

toward integrated risk and resilience solutions.

## Overview

GEM was founded in 2009 with the purpose of improving the global knowledge of earthquake risk and contributing to the reduction of risk worldwide. In 13 years, GEM has become widely known for its global effort to improve the state of practice of earthquake hazard and risk assessment and for its contribution to improving the state of knowledge of earthquake risk.

GEM has also contributed substantially to the broader objectives of the disaster risk reduction community through its public-private partnership, global collaboration network and development of open, global databases and software for application to earthquake and multi-hazard risk assessment. At the same time, catastrophe risks continue to increase, as does the demand for open and credible risk information to inform risk reduction.

What role will GEM play as the risk landscape and associated demand evolve between now and 2030?

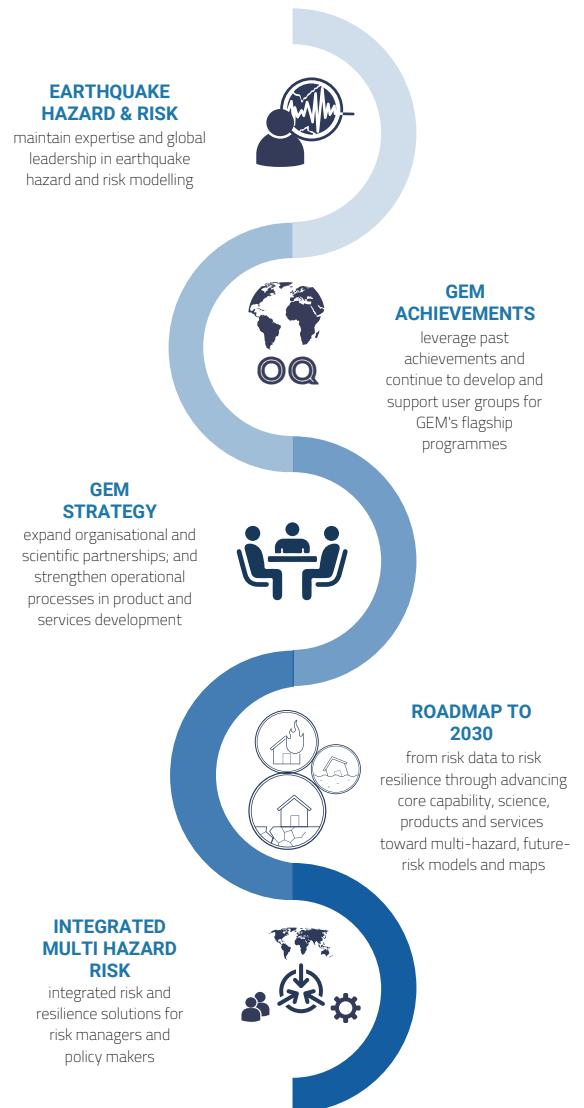
## Approach and Strategy

GEM will maintain expertise and global leadership in earthquake hazard and risk modelling and its applications to disaster risk reduction, in particular, the continuous development and user support for GEM's flagship programmes: the OpenQuake Engine hazard and risk analysis; and the global earthquake hazard and risk maps.

Driven by global drivers such as the Sendai Framework, Sustainable Development Goals, and Paris Climate Agreement, and guided by GEM principles of collaboration, credibility, openness and public good, GEM will expand its organisational, technical and scientific relationships and diversify its risk products and services to engage stakeholders in the broader disaster risk reduction community

To achieve our goals, GEM will strengthen its operational processes from product and services developed from its core activities, to reaching product users and stakeholders through an array of delivery mechanisms and feedback system, and ensure that inputs from our stakeholders and users are processed and integrated into GEM's core activities to enhance existing products and services, or develop new ones.

## Strategic Plan Key Elements from risk data to risk resilience.



## Roadmap to 2030 targets

1

### EARTHQUAKES AND SECONDARY HAZARDS

- Advanced earthquake and secondary earthquake hazards modelling
- Future exposure, vulnerability and risk
- Homogenized global hazard and risk model and map
- Applications to building regulation and urban planning
- Country and global portfolio loss assessment

2

### MULTI-HAZARD AND SYSTEMIC RISK ASSESSMENT

- Multi-hazard risk modelling: earthquake, flood, severe wind, wildfire
- Cascading risk: infrastructure networks and critical facilities
- Exposure for all hazards
- Multi-hazard risk assessments at urban to national scale

3

### INTEGRATED RISK AND RESILIENCE SOLUTIONS

- Hazard and risk metrics and indicators for risk managers and policy makers
- Predicting recovery and incorporation of social vulnerability
- Global resilience indicators and maps
- Multi-hazard, future-risk models and maps
- Hazard and risk information for downstream users

# VISION & MISSION

the foundation of our strategic direction

In line with GEM's evolution, the figure below presents GEM's Vision, Mission and Core Values. In 2018, the vision was modified to go beyond earthquakes to incorporate resilience to natural hazards, and the mission was updated to explicitly incorporate global partnerships and to extend GEM's work from earthquakes to other natural hazards in that context. The mission to 2030 further extends this shift to call for GEM to become a global leader in the integrated, multi-hazard risk assessment and resilience planning domain. GEM core values remain as they have since the founding of GEM in 2009.

 <b>Vision</b>	 <b>Mission</b>	 <b>Core values</b>
<p>A world that is resilient to earthquakes and other natural hazards</p>	<p>Through global partnerships:</p> <ul style="list-style-type: none"> <li>• Continue to be the world's official, most complete source of earthquake risk resources and a globally accepted standard for risk assessment;</li> <li>• Ensure that GEM products find application in catastrophe risk management worldwide;</li> <li>• Become a global leader in integrated, multi-hazard risk assessment and resilience planning</li> </ul>	<ul style="list-style-type: none"> <li>• Collaboration,</li> <li>• Credibility,</li> <li>• Openness and</li> <li>• Public Good</li> </ul>

## Objectives

GEM's overall objective to 2030 is to develop capabilities and to serve the broader need for integrated risk assessment for resilience and sustainability due to globally increasing vulnerability and exposure of populations to natural hazards, including from climate change. GEM will achieve this objective with the following approach:

- Continue to maintain and develop products and services aimed at core collaborators and partners in the science, engineering and risk modelling and analysis community.
- Maintain expertise and global leadership in earthquake hazard and risk modelling and its applications to disaster risk reduction.
- Continue to expand GEM's role in the multi-hazard risk domain to offer products and services that are extensions of current risk modelling capabilities.
- In line with GEM's statute and principles, continue to make information freely and openly available; while at the same time assuring the sustainability of the organisation.
- Develop value-added or enhanced products and services for a wider range of potential users in the risk management and disaster risk reduction sector, as well as for public interest.
- Through collaborations with experts in other hazard domains, and partnerships in initiatives, develop products and services for the multi-hazard risk community to develop integrated risk management solutions for climate change adaptation and resilience planning.

# EVOLUTION OF ACHIEVEMENTS

leveraging past accomplishments and contributions to disaster risk reduction

When GEM was founded in 2009, its early years focused in the development of the OpenQuake Engine, the completion of global research programs and the establishment of worldwide partnerships in order to build an integrated global view of earthquake risk. In the second phase, GEM launched the OpenQuake Platform and released the Global Earthquake Hazard and Risk Maps v2018.1 to promote an open platform and data for global risk assessment and risk information. From 2020, moving toward developing the ecosystem for global earthquake risk management, GEM has released the data behind the global mosaic of earthquake models for non-commercial and public good purposes, launched its products and services strategy and updated the OpenQuake Engine to include the capability to analyze multi-hazard perils.

## Working Program 1 (2009–2013)

GEM established its expertise in earthquake hazard and risk modelling and software/database development, in developing a global network of partners, and in risk assessment programmes in a few key areas of the world. The main products were the OpenQuake engine, and a suite of computational tools and global databases for earthquake hazard, vulnerability and exposure (Figure 1).

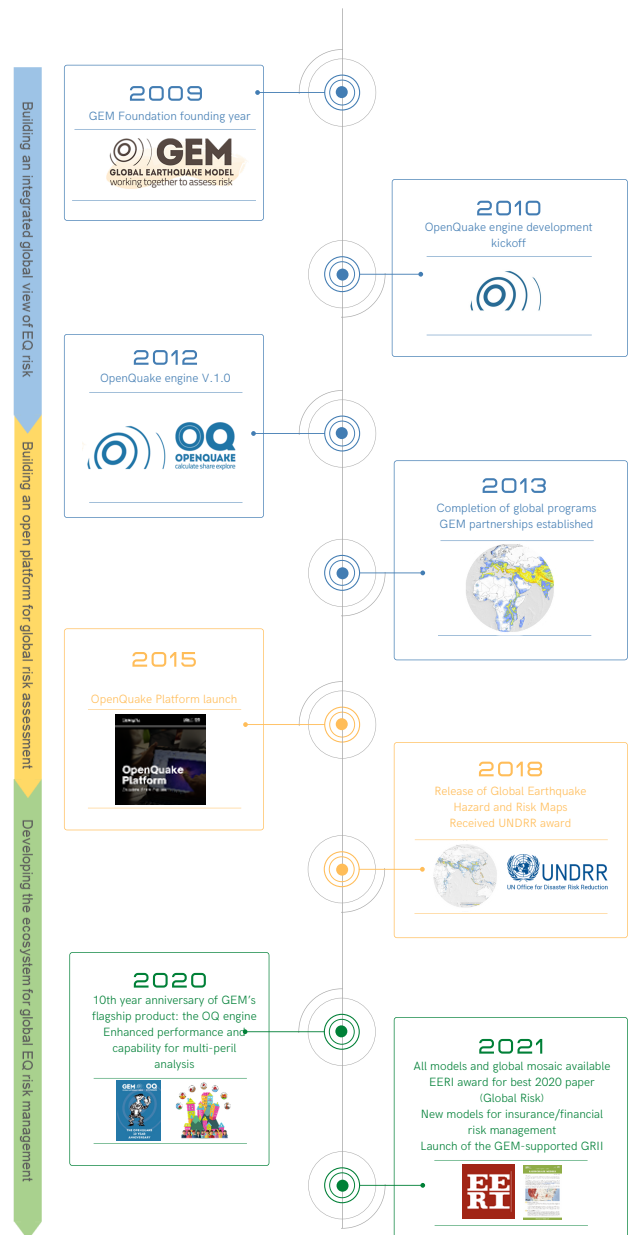
## Working Program 2 (2014–2018)

GEM shifted from a development focus to include applications and capacity building. The work program became centered on improving tools and databases, particularly OpenQuake software, on user support and training, and on capacity building and collaborative risk assessment projects. In January 2015, GEM launched the OpenQuake Platform to provide global, free and open access to GEM's suite of databases, hazard/risk models and computational tools. In June 2015, GEM committed to the completion of a global earthquake hazard and risk model by the end of 2018, which was achieved.

## Working Program 3 (2018–2021)

GEM further diversified its approach by continuing to expand its project-based and services capability, and thus relying less on direct funding from sponsors. In doing so, it became more challenging to meet the demands of sponsors in terms of product development. On the other hand, GEM strengthened its collaborations across the risk modelling/management sector, particularly in natural hazards risk assessment and is widely recognized as the primary source of globally consistent and comprehensive data, models and tools for earthquake hazard and risk assessment. More practically, GEM achieved a significant level of sustainability through a more diversified portfolio of sponsors and project funders, which include development banks, insurance companies, governments and donor agencies.

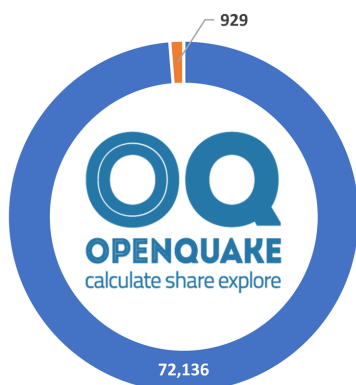
Figure 1. GEM Evolution of Achievements



# FLAGSHIP PRODUCTS

open products for broader availability and accessibility

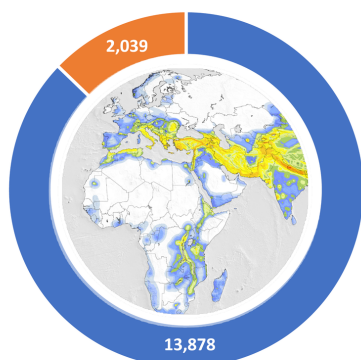
GEM develops open products to make high-quality scientific information on earthquake hazard and risk readily available for public good. Most high-calibre software or data are closed or very expensive. To break this barrier, GEM develops open products in order to promote access to and sharing of information, to promote collaboration and transparency, and thereby build trust among partners and the public. Below are GEM's flagship products to date.



## OPENQUAKE ENGINE (released in 2012)

The OpenQuake Engine is GEM's state-of-the-art, open-source software collaboratively developed for earthquake hazard and risk modelling. The functionality to analyse hazards and risks for a specific site, city, country or region makes the OpenQuake Engine a powerful and dynamic tool for assessing the potential impacts of earthquakes and other natural hazards at any location in the world.

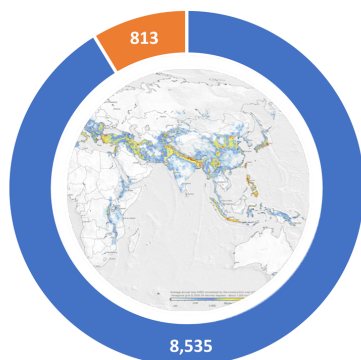
Links: [\[Software\]](#) [\[Manual\]](#) [\[Toolkits\]](#)



## GLOBAL HAZARD MAP (released in 2018)

The Global Earthquake Model (GEM) Global Seismic Hazard Map (version 2019.1) comprises 12 global data layers containing georeferenced hazard values: peak ground acceleration (PGA), spectral acceleration (SA) at 0.2s and 1.0s, on reference rock and with soil amplification for 10% and 2% probability of exceedance (PoE) in 50 years.

Links: [\[OQ Model\]](#) [\[Viewer\]](#) [\[Atlas V1.0\]](#) [\[Comprehensive\]](#) [\[Simplified\]](#)



## GLOBAL RISK MAP (released in 2020)

The global earthquake risk map comprises national and regional exposure and vulnerability models. It is the most comprehensive global assessment of earthquake risk to date. The map is available in various formats e.g. PDF, PNG, digital.

Links: [\[OQ Model\]](#) [\[Viewer: Risk | Exposure\]](#) [\[Country Profiles\]](#) [\[Global Risk Layer\]](#)

■ Page Views ■ Downloads

Page Views vs Downloads from GEM website data since September 2019 (does not include other sources such as Google, GitHub, OQ Platform or other OQ-domain sites)

More products are available at:

[www.globalquakemodel.org/products](http://www.globalquakemodel.org/products)



### OPEN MODELS

for public good and non-commercial purposes



### COMMERCIAL MODELS

for commercial purposes



### SOFTWARE, DATA AND TOOLKITS

complementary resources for OpenQuake

# COLLABORATION FRAMEWORK

working within the disaster risk reduction ecosystem

Figure 2 is a schematic of GEM's place within the disaster risk reduction ecosystem. It illustrates GEM's relationships to product users and stakeholders in the broader disaster risk reduction community. Framing the ecosystem are the global drivers and GEM principles, which guide GEM's overall direction and strategy toward its goal of a world that is resilient to earthquakes and other hazards.

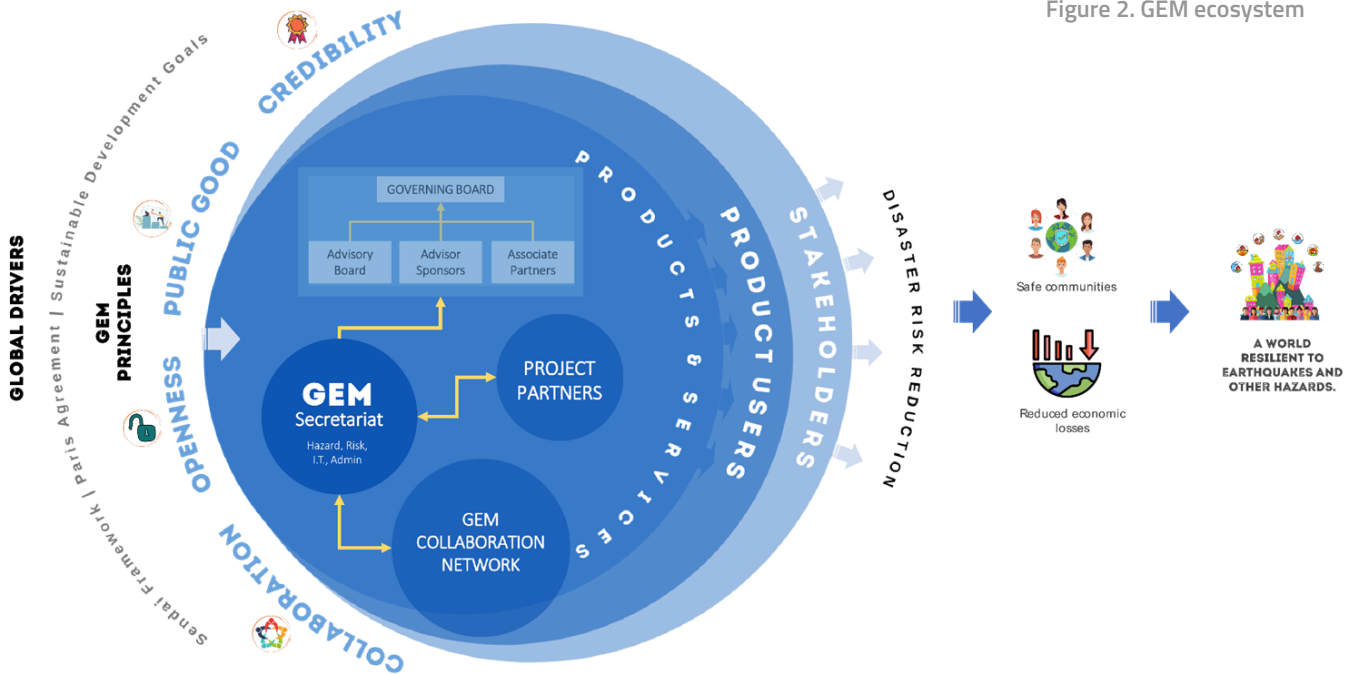


Figure 2. GEM ecosystem

## GEM ECOSYSTEM

Figure 3 is a complementary illustration that describes GEM's operational workflow: from product and services developed from its core activities, to reaching product users and stakeholders through an array of delivery mechanisms. Completing the picture, a feedback loop uses online product and services request forms, surveys and online forums; post-training and project evaluations; and stakeholder and partner meetings. The feedback is processed and injected into GEM's core activities to enhance existing or develop new products and services.

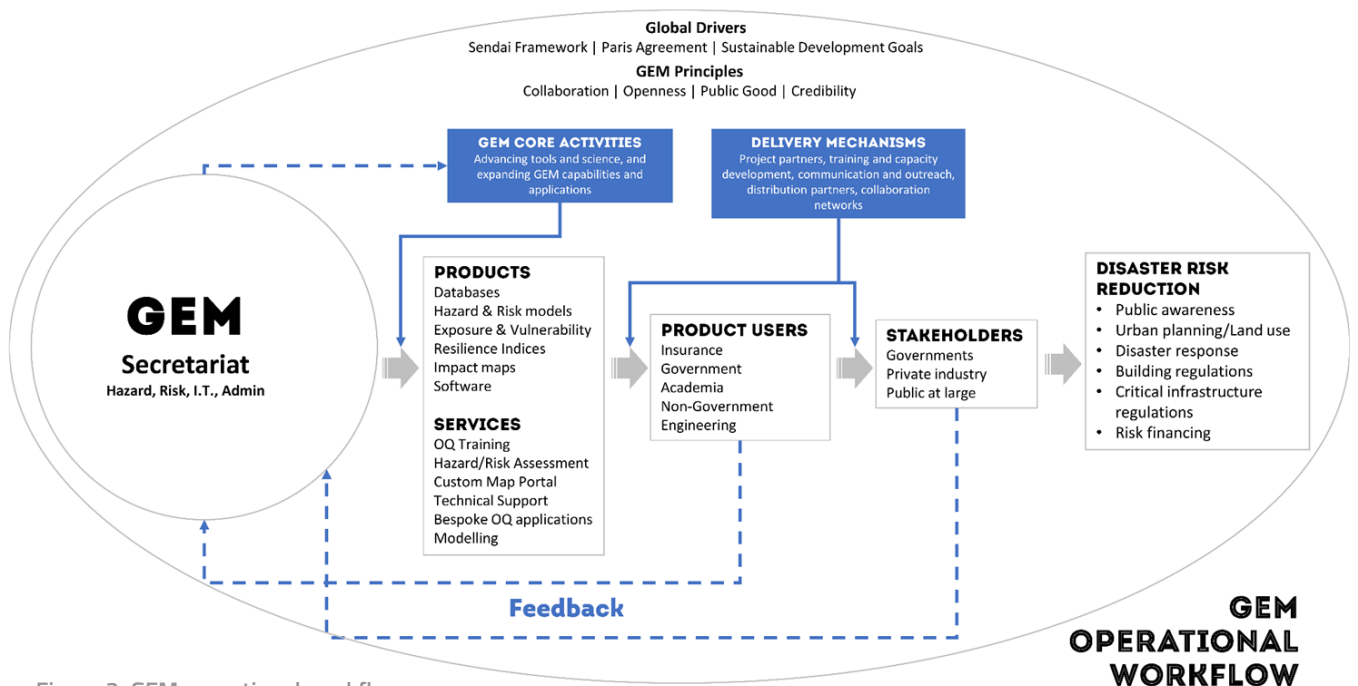


Figure 3. GEM operational workflow

# GEM STRATEGY

roadmap toward integrated risk resilience and solutions

## Future Perspective

GEM’s strategy to 2030 needs to be considered in the overall context of the evolution of risk modelling in support of disaster risk reduction. Figure 4 shows the relationship between data and models (vertical axis) and their corresponding use by data providers and users (horizontal axis) for disaster risk reduction actions (diagonal elements). In this evolutionary process, tools and models become more complex and more informative to aid decision makers in choosing risk reduction pathways in the broader context of societal risk, resilience and sustainability.

GEM’s current work is dominantly in the middle of the diagram (Figure 4), concentrated on probabilistic hazard and risk analyses to assess direct and (to some degree) indirect losses. GEM’s research and applications are gradually moving toward the assessment of systemic risks, integrated risk assessments and risk reduction solutions. As part of this evolutionary process, risk transfer products are evolving to address insurance gaps as part of an overall strategy for disaster risk reduction. In the development context, new risk transfer mechanisms such as parametric triggers and catastrophe bonds are being developed. In this public context, open and transparent models and data are becoming increasingly important as a key component of building trust with governments and the public more generally.

GEM is actively collaborating in international initiatives (e.g., Insurance Development Forum and UNDRR Global Risk Assessment Framework (GRAF)), which are providing the global context for GEM’s continuing evolution as a global leader in developing and disseminating earthquake hazard and risk information. GEM is also fundamentally contributing to the evolution of multi-hazard risk assessments through its risk OpenQuake Engine, global exposure data and standards for exposure and vulnerability modelling. Thus, the future is in continuing to evolve models and tools and extending applications further downstream to users across public and private sectors.

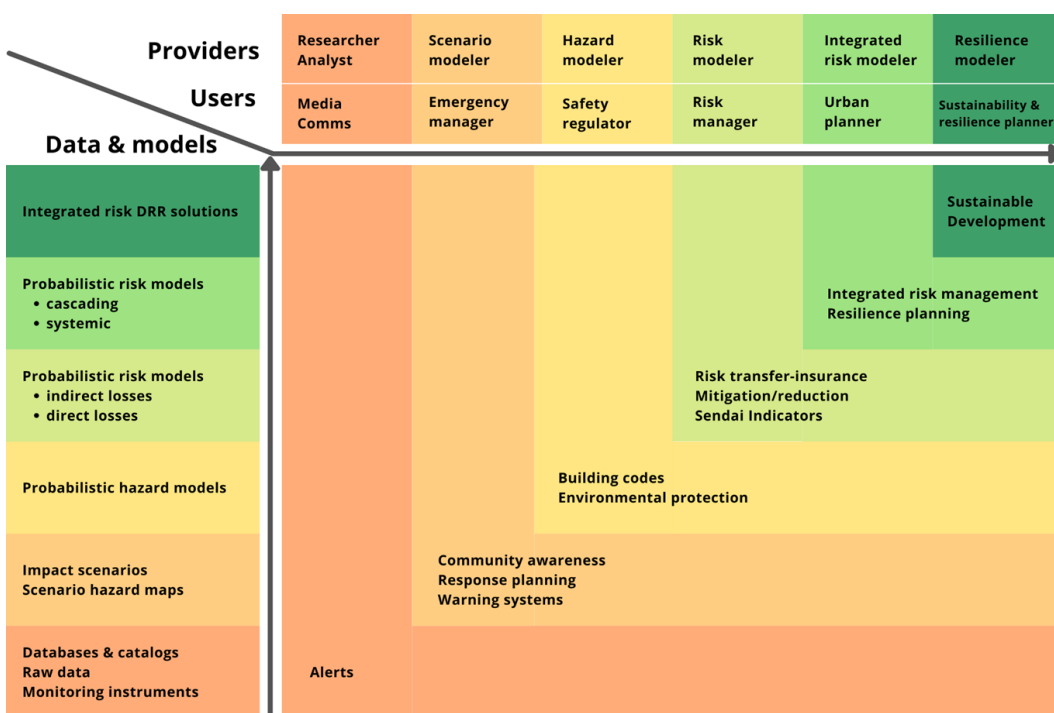


Figure 4. Schematic relationship between data and models (vertical axis) and their corresponding use by data providers and users (horizontal axis) to take disaster risk reduction actions (diagonal elements).

## Roadmap to 2030

Table 1 illustrates GEM’s progression of activities toward 2030 distributed in three 3-year time periods. Most activities in the 2022–2024 period will be carried out under GEM’s current projects and budget, depending in part on additional funding. For the 2025–2027 and 2028–2030 periods, GEM will require additional partnerships and/or funding in order to make significant advances, particularly in multi-hazard risk assessment and in development of downstream tools for risk integration. Investments in the full development of commercial services and products as indicated in the Services area will depend on market demand.

Table 1. Roadmap to 2030

Activities		Milestones			
		Sub-activities	2022-2024	2025-2027	2028-2030
CORE CAPABILITY	Tools for earthquakes and secondary hazard	<ul style="list-style-type: none"> <li>Secondary hazards</li> <li>Model building</li> <li>Urban</li> <li>Earthquake source</li> </ul>	<ul style="list-style-type: none"> <li>landslide, site amplification</li> <li>geodesy and tectonics</li> <li>site amplification tools</li> <li>fault systems modelling</li> </ul>	<ul style="list-style-type: none"> <li>fire, post-loss amplification</li> <li>site amplification toolkit</li> <li>source clustering, aftershocks, time-dependence, complexity</li> </ul>	<ul style="list-style-type: none"> <li>improved uncertainty modelling</li> <li>model testing</li> <li>dynamic rupture modelling tool</li> </ul>
	Multi-hazard and systemic risk assessment	<ul style="list-style-type: none"> <li>Multi-hazard</li> <li>Critical facilities</li> <li>Infrastructure networks</li> </ul>	<ul style="list-style-type: none"> <li>earthquake, volcano, tsunami</li> <li>hospitals</li> <li>transportation</li> </ul>	<ul style="list-style-type: none"> <li>severe wind, flood</li> <li>emergency services, power generation, schools</li> <li>water, power grid, oil and gas</li> </ul>	<ul style="list-style-type: none"> <li>wildfire, drought</li> <li>ports</li> <li>food distribution, telecommunication including internet, banking, etc.</li> </ul>
	Decision support tools for downstream users	<ul style="list-style-type: none"> <li>Hazard and risk metrics</li> <li>Visualisation tools</li> <li>Portals</li> </ul>	<ul style="list-style-type: none"> <li>for technical applications</li> <li>for earthquake hazard and risk (basic financial and human losses)</li> <li>for enhanced global exposure database</li> </ul>	<ul style="list-style-type: none"> <li>for humanitarian applications</li> <li>for earthquake hazard and risk (advanced metrics)</li> <li>for advanced earthquake hazard and risk metrics</li> </ul>	<ul style="list-style-type: none"> <li>for integrated risk management</li> <li>for multi-hazard risk metrics</li> <li>distributed, collaborative network for multi-hazard future risk information</li> </ul>
SCIENCE	Earthquake hazard assessment	<ul style="list-style-type: none"> <li>Modelling occurrence</li> <li>Ground deformation</li> </ul>	<ul style="list-style-type: none"> <li>clustering</li> <li>aftershocks</li> <li>ground displacement</li> </ul>	<ul style="list-style-type: none"> <li>physics-based methods</li> <li>time-dependence</li> </ul>	
	Future multi-hazard risk assessment	<ul style="list-style-type: none"> <li>Forecasting</li> <li>Advanced methods</li> </ul>	<ul style="list-style-type: none"> <li>exposure</li> <li>machine learning in exposure modelling</li> </ul>	<ul style="list-style-type: none"> <li>global vulnerability and risk</li> <li>incorporating Big Data and low-cost sensors in risk modelling</li> </ul>	<ul style="list-style-type: none"> <li>exposure for all natural hazards</li> </ul>
	Advanced risk and resilience metrics	<ul style="list-style-type: none"> <li>Impact data</li> <li>Indirect effects</li> <li>Risk metrics</li> </ul>	<ul style="list-style-type: none"> <li>catalogue of hazard footprints of key events</li> <li>predicting recovery (including with social vulnerability)</li> <li>financial metrics for direct losses</li> </ul>	<ul style="list-style-type: none"> <li>advanced earthquake consequences database</li> <li>estimation of indirect losses</li> <li>advanced risk metrics for DRR</li> </ul>	<ul style="list-style-type: none"> <li>indirect impact (e.g. increase in unemployment, poverty)</li> <li>projected advanced risk metrics for 2030-2100</li> </ul>
PRODUCTS AND APPLICATIONS	Risk and resilience maps and models	<ul style="list-style-type: none"> <li>Global earthquake hazard model and map</li> <li>Country/regional hazard and risk models and datasets</li> <li>Global earthquake risk model and map</li> <li>Global resilience indicators and maps</li> </ul>	<ul style="list-style-type: none"> <li>updated mosaic</li> <li>selected</li> <li>financial and human impact</li> <li>at national scale</li> </ul>	<ul style="list-style-type: none"> <li>homogeneous, global stochastic event set</li> <li>selected</li> <li>advanced risk metrics for DRR</li> <li>update at national scale</li> </ul>	<ul style="list-style-type: none"> <li>updated homogeneous</li> <li>selected</li> <li>multi-hazard, future-risk models and maps, indirect losses</li> <li>at subnational scale</li> </ul>
	Risk and resilience modelling applications	<ul style="list-style-type: none"> <li>Cost-benefit analysis</li> <li>Urban risk assessment</li> </ul>	<ul style="list-style-type: none"> <li>of common DRR measures</li> <li>earthquakes and secondary hazards</li> </ul>	<ul style="list-style-type: none"> <li>of holistic DRR measure, including indirect impact</li> <li>geohazards and indirect effects</li> </ul>	<ul style="list-style-type: none"> <li>of well-being DRR measures</li> <li>holistic, all hazards</li> </ul>
SERVICES	Risk and resilience services	<ul style="list-style-type: none"> <li>Rapid impact assessment</li> <li>Training</li> <li>Education</li> <li>Modelling services</li> <li>Custom portals and dashboards</li> </ul>	<ul style="list-style-type: none"> <li>client-defined</li> <li>OQ basic and general hazard and risk information for downstream users</li> <li>OpenQuake Engine as a Service</li> <li>country and global portfolio loss assessment (third party)</li> <li>Model output disaggregation and maps (static)</li> </ul>	<ul style="list-style-type: none"> <li>client-defined</li> <li>OQ for advanced users</li> <li>educational and training material for seismic risk management</li> <li>earthquake hazard regulations applications at country-level</li> <li>country and global portfolio loss assessment (third party)</li> <li>dynamic maps (e.g. real-time impact)</li> </ul>	<ul style="list-style-type: none"> <li>client-defined</li> <li>risk education for downstream users</li> <li>application of regulations to countries</li> <li>EQ loss model testing as a service</li> <li>holistic, multi-peril, risk information</li> </ul>



# WAYS & MEANS

## resources for roadmap activities

This section overviews GEM's available resources for the 2022-2024 period, as well as to meet GEM's overall objectives as defined in the Vision, Mission and Core Values section. It also addresses our strategy to increase revenue, resources, partnerships and projects in order to advance to multi-hazard and systemic risk assessment, and integrated risk and resilience solutions.

### GEM revenue

Figure 5 shows total revenue from 2013 to 2021, with projections to 2024, broken down into contributions from sponsors, institutional projects and commercial revenue. From 2013 to 2019 GEM experienced a reduction of 55% in total annual revenue, dropping from just over 4M euro to just under 2M euro per year. This change was driven largely by reduced sponsorship fees in 2019, coupled with the loss of sponsors from Working Program 2 (2014-2018) to Working Program 3 (current). From 2019 to 2021, the total revenue increased due to gradual increases in sponsorship, institutional projects and commercial revenue. We anticipate this trend to continue for the foreseeable future, with the largest increase coming from commercial sale of products and services.

Figure 5. Distribution of revenue by source 2013-2024.

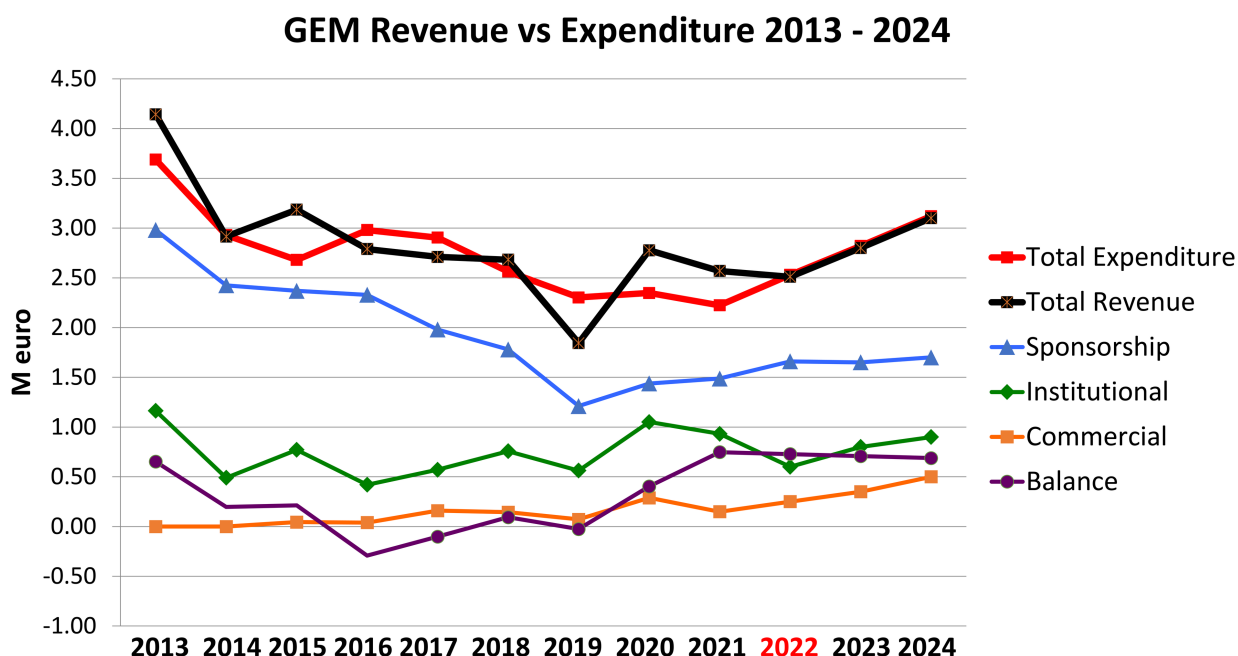


Figure 5 shows total revenue versus expenditure from 2013 to 2021, with projections to 2024. This increasing trend is largely due to increased revenue, but the trend also benefits from slightly reduced expenditures due to savings in travel and office expenses, a direct consequence of COVID response measures. In 2022-2024, we are increasing investments in areas that will allow us to meet increasing demand for products and services and achieve the projected revenue targets.

### GEM Secretariat Resources

GEM is upgrading its computational hardware and cloud computing; hiring additional staff for business development/marketing, OQ development, hazard and risk modelling; and investing in products and services development.

The Strategy acknowledges and prioritizes the need to invest further resources into the maintenance of core databases and models that make up the global mosaic of hazard and risk models. It also acknowledges the demand for commercial risk models and datasets for the insurance and engineering sectors, which will be delivered mainly through third-party platforms, as well as through GEM services to additional downstream users. Investments in these products and services are also fundamental to the Strategy to generate revenue that will be reinvested in order to assure long-term sustainability.

We will seek cost-effective mechanisms for increasing resource capacity by hiring post-docs, providing grants to PhD students, and seconding students from other universities to GEM for training as well as co-development of products via partnerships.

## GEM Sponsorship, Institutional Projects and Commercial Revenue

GEM will continue to conduct and manage a wide range of projects with sponsors, project partners and product distribution partners which contribute to one of the three streams of deliverables. We now offer project partnership opportunities as part of private governor sponsorships. This type of funding is envisioned to augment resources for development of commercial models or other products that can be marketed to the insurance or engineering sectors.

In order to extend GEM’s capability and influence into the multi-hazard and risk resilience domains, we will continue to strengthen and establish strategic partnerships with key global initiatives and also seek collaborative projects with GEM Associate Partners, where there may be sources of additional funding or mutual benefit in data/information exchange.

We will also seek to extend partnerships with downstream organizations that are providing products that extend GEM’s reach beyond its direct sponsors and users. We will continue to develop partnerships with third-party hazard/risk model/data providers, and to extend product offerings to these and other platforms. We will also seek opportunities to develop partnerships with other organizations providing products to the broader disaster risk reduction sector.

In academia, GEM will continue to seek partnerships with universities for student exchanges that develop capacity particularly for students from developing countries, but also foster the development/improvement of products or applications that are useful to GEM partners and stakeholders.

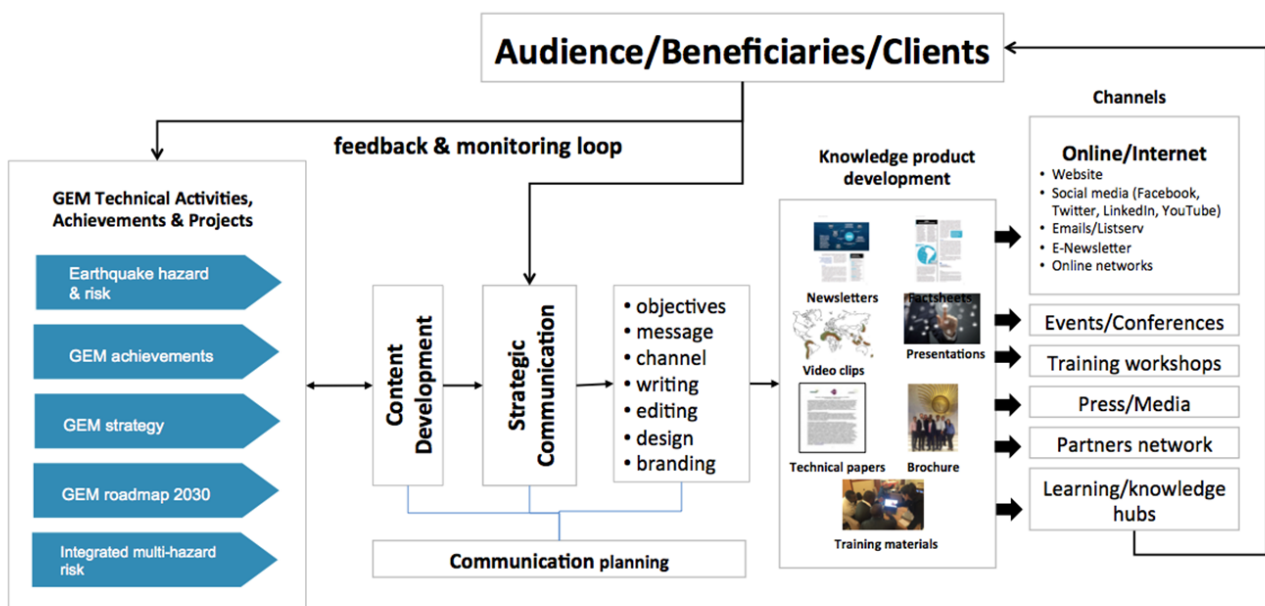
## Project Funding pipeline

GEM continuously seeks project funding, typically maintaining about 20 project proposals in its pipeline, with proposals either under development or proposals awaiting decisions. Such projects are fundamental to extending GEM’s funding for the development of capabilities, products and services. GEM will continue to actively seek and participate in project opportunities needed to meet program objectives.

## Communication Support Plan

GEM’s Strategic Plan 2030 is built around how the organization can further enhance and at the same time leverage and contribute its expertise in earthquake hazard and risk assessment to the increasing need for a multi-hazard and integrated risk analysis approach in disaster risk management.

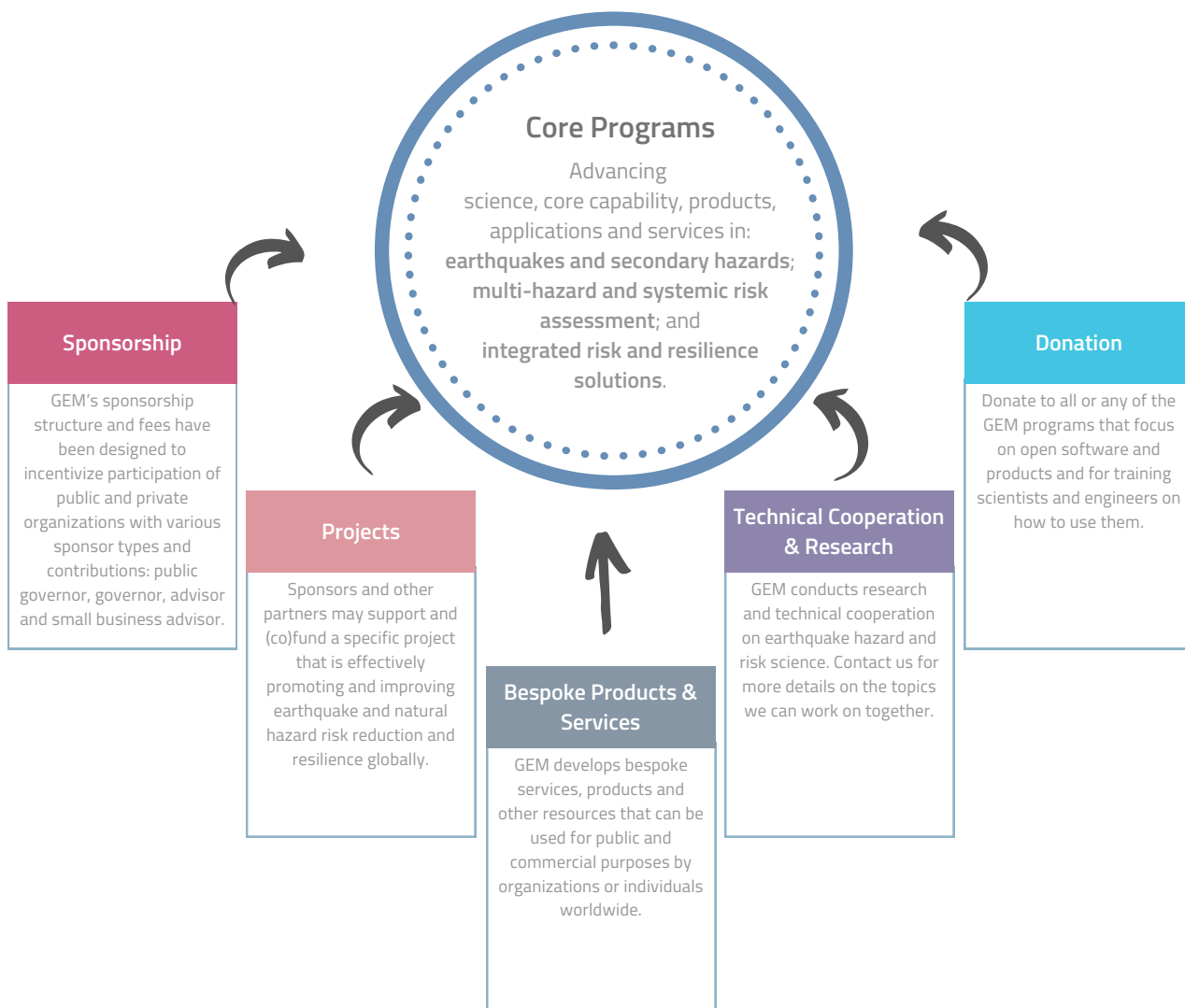
Given this context, GEM’s communication plan will aim to align its activities with the organization’s strategic direction in order to support its goals. The timeline will follow the technical activity schedules indicated in Table 1. An overview of how to integrate communication support into the Strategy is illustrated below.



# HOW TO SUPPORT OUR 2030 GOAL

various ways to support our work

GEM offers flexible mechanisms to enable potential partners to contribute to its ongoing and future work programs. Partners and collaborators can enter into sponsorships, project partnerships and service agreements, and can select the level of engagement based on their needs and requirements.



## PARTNER FEEDBACK



**Michael Ewald**  
Swiss Re

GEM provides state-of-the-art science, software tools. We believe that the pioneering work done by GEM will lead to a new era of collaboration and transparency on seismic hazard and risk assessment.



**Mami Mizutori**  
UNDRR Head

The release of GEM's earthquake hazard and risk data for public access is a great example of how the world of science can contribute to the implementation of the Sendai Framework for Disaster Risk Reduction.



**Surya Shrestha**  
NSET

GEM's earthquake resilience performance scorecard methodology has been used in Lalitpur as inputs for the building code process. We are keen to move forward and to further use the scorecard method in the future.



**Sonia Talwar**  
NRCan

Canada will remain committed to support GEM through development and enhancement of hazard and risk models, tools and data that are critical in formulating disaster risk reduction plans and strategies.

# SUPPORTERS

collaborators from public and private institutions worldwide

GEM comprises collaborators from public, private, academic and non-government organizations worldwide. These partners work together to advance the state-of-the-art for disaster risk reduction by developing data, tools and information and conducting hazard and risk assessments for improving our understanding of earthquake hazard and natural hazard risk globally.

## Sponsors

Over the past five years, the number of sponsors has been steadily growing. More recently, we have successfully broadened the sponsorship categories to include Advisor Sponsors, which has led to a stabilization in revenue, with more funding and sponsors now coming from the private sector than from the public sector.

### Public Governors



### Private Governors



### Advisor Sponsors



## Associate Partners

Associates participate as observers on the GEM Governing Board. They are invited for their common interests in earthquake/natural hazard research and application, or natural hazard risk reduction more broadly, generally with a regional or global perspective.



## Product Delivery Partners

GEM's Product Delivery Partners for third-party distribution of models and data to the insurance and engineering sectors offer GEM commercial risk models (China, S. Africa, Colombia), global earthquake hazard map, and other risk information.



## Advisory Board

The Advisory Board is the body through which the global strategy of the GEM Foundation and corresponding implementation is monitored, reviewed, advised and guided. It advises the Foundation on science and technology, risk management, and other international and interdisciplinary topics.

## Projects and Project Partnerships

GEM has participated in a wide range of institutional and commercial projects either led by GEM or where GEM played a significant role. GEM has successfully implemented hazard and risk assessment projects with regional, national and local collaborators covering more than 150 countries in the following areas: Europe, Middle East, South America, Central America, North America, Sub-Saharan Africa, Asia and the Pacific. Projects typically focus on development of national or regional hazard and risk models.

## Partnerships in major initiatives and collaboration networks

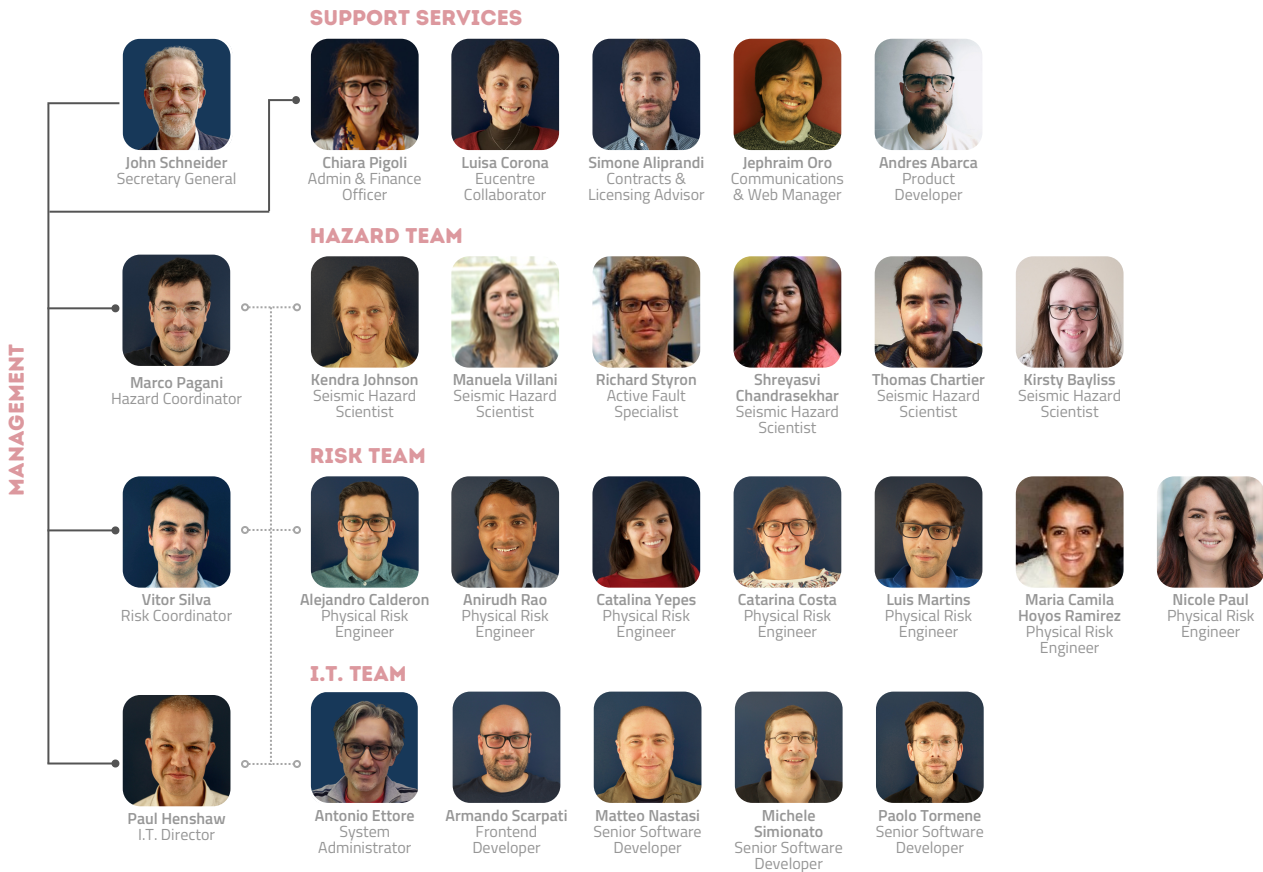
GEM participates in a number of global initiatives and collaboration networks that provide mechanisms for disseminating information, developing partnerships and, in some cases, funding opportunities. New initiatives that provide promising opportunities for partnership and external funding are the Global Risk Modelling Alliance (GRMA), the Global Risk Assessment Framework (GRAF) and the Global Resilience Initiative (GRII). All are aimed at providing multi-hazard risk modelling for multi-hazard risk assessment.

# GEM TEAM

the people behind the GEM Foundation

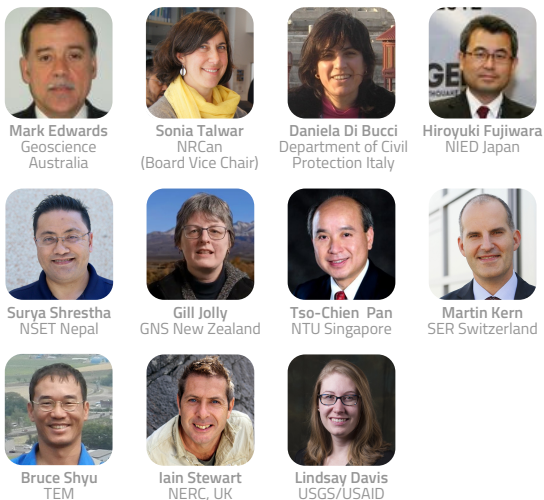
GEM is composed of teams from the Secretariat, Governing Board and Advisory Board working together in the development and implementation of international work programs on hazard, risk and social vulnerability model development, training, software development for seismic hazard and risk analyses, and international collaboration.

## GEM Secretariat

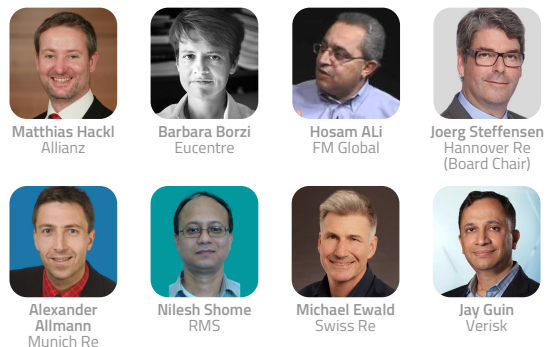


## GEM Governing Board

### PUBLIC GOVERNOR



### PRIVATE GOVERNOR



### ADVISORY BOARD



# KEY PERFORMANCE INDICATORS

## accountability and transparency

Based on the above strategic direction outlined in the previous sections, we articulate key performance indicators (KPIs) that will be used to monitor and measure GEM's progress on an annual basis. KPI's include:

- Meet total revenue targets, comprising a combination of commercial, institutional and sponsorship revenue.
- Augment GEM in-house resources through strategic investment, in line with available budget.
- Complete and release outputs/products defined in Table 2 according to the four levels of risks, and in line with funding and resources available.
- Establish key partnerships that enable GEM to extend its capabilities into multi-hazard and resilience risk modelling.
- Actively seek funding opportunities for grant applications and risk modelling applications in line with sponsor priorities and GEM's mission.
- Increase product distribution and sales through third-party platforms.
- Establish partnerships with downstream users to enable transfer of hazard and risk information to a broader range of users and decision makers.

These KPIs will be further quantified and refined annually in the development of the annual work plan.

In addition, through annual reporting, we will continuously monitor and demonstrate progress toward the strategic objectives, defining additional indicators as required in support of advancing toward these objectives:

- Continue to maintain and develop products and services aimed at core collaborators and partners in the science, engineering and risk modelling and analysis community.
- Maintain expertise and global leadership in earthquake hazard and risk modelling and its applications to disaster risk reduction.
- Continue to expand GEM's role in the multi-hazard risk domain to offer products and services that are extensions of current risk modelling capabilities.
- In line with GEM's statute and principles, continue to make information freely and openly available; while at the same time assuring the sustainability of the organization.
- Develop value-added or enhanced products and services for a wider range of potential users in the risk management and disaster risk reduction sector, as well as for public interest.
- Through collaborations with experts in other hazard domains, and partnerships in initiatives including the GRII and the GRMA, GEM will develop products and services for the multi-hazard risk community and will aim to develop integrated risk management solutions for climate change adaptation and resilience planning.

