



**UNISDR Science and Technology Conference  
on the implementation of the Sendai Framework for Disaster Risk Reduction 2015-2030**

**Launching UNISDR Science and Technology Partnership and the Science and  
Technology Road Map to 2030**

*To promote and support the availability and application of science and technology to  
decision-making in Disaster Risk Reduction*

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**Short concept note: Work Stream 3, Working Group 2**

**Generating, Synthesising and Sharing Data and Knowledge  
in support of Implementation and Reporting**

## 1) Overview

The Sendai Framework calls for an understanding of risk in all of its dimensions including both natural and man-made hazards (i.e. technological hazards) as well as exposure and social vulnerability/capacity in order to achieve its targets. It highlights that: *“disaster risk reduction requires a multi-hazard approach and inclusive risk-informed decision-making based on the open exchange and dissemination of disaggregated data, including by sex, age and disability, as well as on easily accessible, up-to-date, comprehensible, science-based, non-sensitive risk information, complemented by traditional knowledge”*.

Current and future disaster risks as well as the underlying risk factors are increasing in complexity and interconnectivity with exposure continuing to increase. The expanding population in disaster risk hotspots and most importantly the rapidly expanding built-infrastructure (Bilham 2009) are probably the highest risk drivers in low-income countries undergoing rapid development. The projected increase in the built environment is daunting especially informal settlements that cannot comply with the risk-safe construction regulations. This evolving picture requires synthesis and improvements across data collection and management methods for better loss accounting and progress monitoring.

The year 2015 is a historic year in global policy with the publication of three landmark UN agreements: **The Sendai Framework for Disaster Risk Reduction 2015-2030**, which aims to reduce disaster losses in lives, livelihoods and health (agreed in March in Sendai, Japan by 187 countries); **The Sustainable Development Goals (SDGs)** which are the successors of the Millennium Development Goals (agreed in September in Paris, France by 193 countries); and **the climate change agreements** (still due at the time of writing). The rare coincidence of three such agreements is an opportunity of global significance for building coherence across these policy streams including through shared monitoring and indicators.

The Sendai Framework for Disaster Risk Reduction (herein referred to as Sendai Framework) defines precise global targets. The achievement of the targets requires adequate data and information to inform monitoring through quantitative and qualitative indicators. There is a general understanding of what the indicators will measure and what data will be required for monitoring and it is clear that they will require coherence with other major global policy frameworks and monitoring systems. For example, the Sendai Framework calls for: *“supporting the development of coherent global and regional follow-up and indicators, and in coordination, as appropriate, with other relevant mechanisms for sustainable development and climate change”*.

Therefore, this **concept note** discusses data needs identified in: (1) the Sendai Framework, (2) discussions held in Open-ended Intergovernmental Expert Working Group on Indicators and Terminology Relating to Disaster Risk Reduction;(3) parallel discussions on the Sustainable Development Goals (SDGs) indicators; (4) the twenty-first session of the Conference of the Parties (COP21) of the United Nations Framework Convention on Climate Change (UNFCCC) and the eleventh session of the Conference of the Parties serving as the meeting of the Parties

to the Kyoto Protocol (CMP11) that are expected to adopt the successor agreement to the Kyoto Protocol; and (5) the expected outcomes of the United Nations Conference on Housing and Sustainable Urban Development (Habitat III) which also addresses underlying factors of disaster risk that are directly related to both the Sendai Framework and the SDGs. However, targets and indicators for the new climate change agreements and the Habitat III outcomes are not available for analysis at the time of writing.

This concept note takes stock of good practices for data collection and management as well as on guidelines and protocols (discussed in more detail by Working Group 1). The note identifies the current gaps as well as the opportunities for data generation, knowledge management sharing and synthesis in support of the implementation and reporting on progress of the Sendai Framework.

**Participants in the working group are invited to discuss these elements and make further proposals that will inform the Road Map for Science and Technology.**

## 2) Stock taking

The seven global targets of Sendai Framework aim to achieve measurable improvements related to: a) mortality, b) the number of affected people, c) direct economic disaster losses, d) damage to critical infrastructure and basic services, e) increase in the number of DRR strategies, f) enhancement of cooperation, as well as g) increase in the availability of and access to multi-hazard early warning systems and risk assessments (see Appendix).

There are notable areas of synergy between the major global frameworks of 2015 and the SDGs have identified a number of targets that call for indicators measuring processes related to disaster risk. Five SDG targets (1.5, 2.4, 11.b, 11.5 and 13.1) pertain to disaster risk reduction (DRR) and are, therefore, areas of potential synergy with the Sendai Framework. In particular, goal 11.5 formulates a quantifiable target as follows: *“by 2030 significantly reduce the number of deaths and the number of affected people and decrease by y% the economic losses relative to GDP caused by disasters”*.

Also, land degradation of agricultural assets will impact the nutrition base of the most vulnerable and degradation of ecosystem services may affect the health status of the most vulnerable. SDG Target 13.1 calls for measuring the adaptive capacity to climate-related hazard and disasters triggered by other natural hazards; SDG target 14.5 calls for measuring and conserving 10 per cent of coastal and marine areas, that most exposed to extreme meteorological events; SDG Target 15.1 calls for the restoration of terrestrial and inland ecosystem services. Underlying causes of disaster risk are addressed in the new climate change agreements and the expected outcomes of Habitat III.

## 1) What is available?

### ***Loss databases***

Current loss databases are hampered by a number of shortcomings. Data are recorded by different institutions that serve different purposes and thus are generated with different protocols (see WS3 WG 1). Loss data are not collected with the detail/granularity required for accurate reporting and sources are often non-validated.

The data sources for the indicators measuring the Sendai Framework targets a) – d) are very fragmented. Loss data are recorded by a variety of institutions including academic, governmental or private sector all of which have different aims. Nation-wide loss data are typically collected by public institutions while global loss data are held and maintained by re-insurance companies for commercial purposes and by academic institutions for research purposes. The private sector is more effective in some countries than others. Often loss data even if available are not accessible, neither from the private nor the public sector. A point of tension is in achieving measurability and consistency across countries and regions while maintaining local relevance and granularity.

### ***Standards for data sharing and management***

The standardization of loss data is progressing slowly. The few open sources of loss data that are available are not suitable for spatial and temporal comparisons. Loss data recording also varies within countries. High-income countries typically report better than low income countries. The standardization of loss data collection processes has been promoted by UNISDR through expanding the DESINVENTAR methodologies to the many countries that still require capacity building. DESINVENTAR may be adapted to better capture the variables required to build indicators for the Sendai Framework (see WS3 WG1 and 3). Programs such as the DATA Working Group of the Integrated Research on Disaster Reduction (IRDR-DATA) have produced the 'peril classification and hazard glossary' that is one attempt to provide a standard attribution of hazards worldwide (IRDR 2014).

### ***Risk assessment models***

The Sendai Framework advocates that "Policies and practices for disaster risk management should be based on an understanding of disaster risk in all its dimensions of vulnerability, capacity, exposure of persons and assets, hazard characteristics and the environment". Risk assessment and modelling is advancing, at national and global level – albeit unevenly for different regions and countries - through international initiatives such as the Global Earthquake Modelling initiative and most importantly through the Comprehensive Approach to Probabilistic Risk Assessment (CAPRA) a probabilistic multi-hazard modelling used in Global Assessment Report (GAR 2015). Most Latin American countries use results from CAPRA to guide the risk financing secured through the Inter-American Development Bank America (Andersen 2007). CAPRA is now also used in regional and national probabilistic modelling in other parts of the world including the Indian Ocean and Southeast Asia and has been used for the Global Risk Model that supports the UNISDR GAR13 and GAR15.

## 2) What is needed?

The needs for monitoring the implementation of the Sendai Framework are centred on accounting based on loss indicators and on disaster risk reduction in general. As outlined in the Sendai Framework, an important need is: *“To systematically evaluate, record, share and publicly account for disaster losses and understand the economic, social, health, education, environmental and cultural heritage impacts, as appropriate, in the context of event-specific hazard-exposure and vulnerability information”*.

### ***Interdisciplinarity and data synthesis***

Disaster loss accounting for monitoring the Sendai Framework requires therefore quantitative socio-economic and physical data as well as qualitative information which can support DRR governance. The quantitative data relate to human loss data (i.e. mortality, affected people) disaggregated by gender and age and exposure, hazard and vulnerability used in assessing risk. Physical loss data relates specifically to physical infrastructure and basic services. The qualitative data relate to governance and specifically to the implementation of disaster risk strategies and the deployment of early warning systems and mechanisms in the different countries and regions (see Work Stream (WS) 2 Working Group (WG) 1 on ‘Early warning and hazard monitoring’ and Working Group 3 on ‘Risk assessment and management’).

### ***Balancing scalability versus local relevance and accuracy***

Risk assessments rely on good exposure, vulnerability and hazard data with accuracies that need to be adequate to the scale of analysis. Global risk models need to be consistent in time and space. At continental level, risk models rely on exposure datasets are rarely standardized and with adequate detail over the entire area of interest. For example, despite the advances in seismic knowledge over the past years, there is still no continental seismic risk assessment available for Europe, a notoriously data rich continent. For local risk models, hazard datasets lack spatial detail required to capture the underlying drivers, and loss data lack good geospatial referencing which makes comparability and analysis difficult over time and space (Cutter 2015). For example, there is a lack of accuracy on the spatial distribution of the building stock and most importantly on its structural characteristics and vulnerability.

### ***Governance and guidelines for loss reporting***

The Sendai Framework recommends improving guidelines for loss reporting. In particular, human loss data need urgently to be disaggregated by psychosocial characteristics including gender and age. In other words, there is a need to collect and compile accurate and comprehensive data at local, national and global level that are sufficiently detailed and accurate and also comparable.

Governance of DRR has been addressed in many countries where some have advanced in the implementation of DRR strategies and the establishment of early warning systems more than others, especially under the commitments of the Hyogo Framework for Action (HFA). In fact,

early warning systems have been deployed in many regions of the world after the 2004 Indian Tsunami that was the catalyzing event for the launch of the HFA.

The human and physical exposure information should be taken into account in the development of indicator for loss accounting and for normalizing the losses over time. Losses should be measured against the exposed/affected assets of a given event. Also, the collection of exposure and vulnerability data – still largely under the responsibility of disaster management agencies – should transition into the responsibility of statistical offices. Statistical offices may benefit from innovative solutions provided by the private sector that may be more efficient in data generation and equally accountable.

### ***Knowledge sharing***

Cooperation on technology transfer has begun with the help of a number of United Nations agencies, international NGOs and within countries. Formal processes for data sharing and data generation are starting to be addressed within the different frameworks of the post-2015 development agenda. However, no formal mechanism exists.

Risk modelling methods need to be promoted and made available at all geographical levels and for all regions of the world. The appropriate modelling technique, whether deterministic, probabilistic or heuristic should be considered for the task at hand. Modelling should be encouraged for sizing preparedness and response/recovery measures. Probabilistic modelling should be used more often. For example, it should be used more extensively to targeting financial ministries with the double benefit of awareness rising within policy makers and for promoting the institutionalization of a financial coverage to be used in case of disasters.

### ***Capacity building in new technologies and risk modelling***

New methodologies on recording, organizing and storing data, and on reporting are in demand. The following geospatial technologies should be considered: 1) Geographical Position Systems, 2) Geographic Information Systems, 3) Earth Observation (in situ and remotely sensed), 4) hand-held portable devices in support of crowd sourcing that can provide the following advantages: a) precise location of disaster risk information, b) geo-spatial organization of the data with increased effectiveness on analysis as well as reporting and data sharing, c) synoptic overview for physical exposure and damage overview, and d) rapid and standardized field data recording also for fast reporting. However, their update requires capacity building to enable them to be useful, usable and used.

These technologies have penetrated in part the physical sciences; for example physical loss recording is now expedited by the combined analysis of post disaster imagery with that provided through remotely connected hand held devices operated on the ground. In fact, information on disasters could be disseminated for decision making within hours of the recording from any location on Earth. The agricultural, housing as well as the energy sector are in part already using these technologies. Similar technologies may be adapted for use also in the social sciences. Also, epidemiological databases used for monitoring and surveillance of

disease and mortality could be linked to spatial databases for improved analysis, reporting and dissemination of disaster impacts.

Health professionals could be more actively engaged in these international processes to ensure read across from health data to disaster data and vice versa, particularly in addressing vulnerability. They can do this by supporting greater consideration of health outcomes and articulating the links with socioeconomic determinants; highlighting the scientific evidence and available data on the impact of disasters on health outcomes; and helping to understand and develop the role of the health sector and strengthening the planning processes, for example by participating in the Science and Technology partnership to mobilize science for action on DRR and resilience building (Murray 2014).

Loss databases may be structured and made available through agreed upon common guidelines and open source tools. Countries less trained and equipped should be helped in absorbing the technologies, the guidelines and the knowledge. Loss databases should be combined with exposure, hazards and vulnerability databases and become risk modelling databases. The constant update of these risk related databases will generate disaster risk knowledge that will incrementally improve the relevance of risk assessments.

Risk modelling databases will need to integrate also local and indigenous knowledge and be used for promoting community engagement in data analysis, communication and dissemination. That in turn will increase the awareness of the communities, the policy makers and the exposed public at large.

Risk modelling should also include indirect losses assessments even if not specifically requested by Sendai Framework reporting. In fact, direct accounting alone may severely bias the economic impact of hazards especially in an increasing interdependent economy when cascading effect may have a multiplying effect on losses. Most importantly, a new holistic approach to risk, that would address the shortcomings of direct and indirect loss assessments, should be considered.

### ***Communication and dissemination***

There is a need to establish mechanisms to share lessons learnt and to disseminate them to Governments, practitioners/scientists as well as with those working on the SDGs and other International frameworks (UNFCCC and Habitat III). The proper mechanism for sharing needs to be well thought through as it is the key to a successful DRR (**see Work Stream 1 for a detailed discussion of the role of networks and partnerships**). Sharing and communicating losses and disaster risk information with the wider public should also become a central activity. The knowledge sharing through the wider public – especially those most at risk – is alone one of the best risk reduction activity.

### 3) The way forward?

The section provides a set of recommendation mapped against the Strategic Science and Technology Roadmap as from the table below.

| Priority for Action 1: Understanding Disaster Risk   |   |   |
|--|---|---|
| Expected Outcome   | Key Action  | Recommendation  |
| 1.1 Assess the current state of data, scientific knowledge and technical availability on Disaster risks reduction and fill the gaps with new knowledge.                  | Record and share disaster losses and disaggregated impact data and statistics                                   | Encourage the responsibility of data collection with governments to ensure national Disaster loss Databases are in line with UNISDR guidelines for recording disaster loss and disaggregated impact data.<br><br>Period Assessments of national risk management, risk assessment and mapping capabilities |
| 1.2 Synthesize, produce and disseminate scientific evidence in a timely and accessible manner that responds to the knowledge needs from policy-makers and practitioners; | Promote real-time and near real-time access to reliable data and use information and communications technology; | Establish mechanisms to share knowledge and good practises for Sendai reporting, especially with less prepared countries  |
|  | Engage scientific focus on disaster risk factors and scenarios, including emerging disaster risks               | Establish Regional research/policy bodies at the forefront of testing/monitoring  |
| 1.3 Ensure that scientific data and information can support and be used in monitoring and reviewing progress towards disaster risk reduction and resilience building.    | Develop and monitor a set of core indices and indicators to measure progress                                    | Define Realistic set of variables for development of indicators   |
| Priority for Action 3: Investing in Disaster Risk Reduction for Resilience   |   |   |
| Expected Outcome   | Key Action  | Recommendation  |
| 3.1 Provide scientific evidence to enable decision-making of policy  | Promote the mainstreaming of disaster risk assessments and mapping into land-use                                | Establish geo-spatial risk modelling databases  |

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| options for investment and development planning  | planning and other policy development and implementation, and rural development planning and management  |   |
|  | Promote cooperation between academic, scientific and research entities and networks and the private sector to develop new products and services to help reduce disaster risk | <ul style="list-style-type: none"> <li>• Establish National and regional knowledge centres for disaster risk management</li> <li>• Establish National and regional Communities of Users and Practitioners</li> </ul>  |
| Priority for Action 4: Enhancing Disaster Preparedness For Effective Response, and to “Build Back Better” In Recovery, Rehabilitation and Reconstruction       |  |   |
| <b>Expected Outcome</b>  | <b>Key Action</b>  | <b>Recommendation</b>   |
| 4.1 Identify and respond to the scientific needs of policy – and decision-makers at all levels to strengthen preparedness and resilience                       | Support the development of resilient systems and services  | Involve statistical offices in DRR data generation  |
| 4.2 Build capacity to ensure that all sectors and countries understand, have access to, and can use scientific information for better informed decision-making | Enhance knowledge and technology transfer and promote the use of global technology pools to share know-how, innovation and research  | <ul style="list-style-type: none"> <li>• Fund training for practitioners and institutions at all levels</li> <li>• Improve loss data collection through the promotion of capacity development and encourage involvement of private sector</li> <li>• Facilitate integration and capacity development by creating an advisory board at regional level (i.e. UNESCAP, UNECE, ECLAC, EU) and organize at least two annual meetings over the 2015-2030 period.</li> <li>• Encourage agreement on public disclosure of public and private owned loss and exposure (physical and human) data</li> <li>• Establish formal mechanism for sharing relevant, common,</li> </ul> |

|  |  |   |
|--|--|---|
|  |  | set of indicators, amongst the post-2015 frameworks’ <ul style="list-style-type: none"> <li>• Establish alliance of institutions to assemble exposure, vulnerability loss and hazard data for national, continental and global modelling</li> </ul> |
|--|--|---|

**Can these proposals be strengthened further? Are there specific next steps to strengthen the data needed to achieve the targets of the Sendai Framework at local, national, regional and global levels? What specific initiatives and partnerships can be put in place, for example, in strengthening loss data that provides information on exposure and vulnerability/capacity across all hazards? What are examples of good practice from around the world? How can these actions be captured in the Road Map to guide implementation?**

Participants in this working group are invited to consider how the scientific community can work to address the above challenges and answer the call of the Sendai Framework. A few proposals are made below for consideration during the discussions.

**Governance**

1. The responsibility of data generation should remain with governments/academia or international institutions working with governments.
2. Regional and international organization should be the first to start testing indicators for reporting against Sendai targets. Those organizations should also monitor the progress of reporting against the Sendai targets.
3. Institutions under the leadership of UNISDR should agree on a realistic set of variables used to develop indicators for the Sendai Framework reporting as well as propose risk indicators for measuring the current and future underlying risk factors based on the cooperation with technical working groups addressing the SDG’s, the new Climate Change Convention and other relevant international frameworks.
4. In the longer term – possibly after 2020 - it should be statistical offices that institutionalize the collection of loss data as well as physical exposure and physical vulnerability for risk assessment.
5. Monitoring and enforcing the Sendai Framework should be closely linked to the monitoring and enforcing the other International Frameworks. The SDGs, the new climate convention/agreement, and Habitat III indicators all to a certain extent address the underlying causes of risk that when acted upon may be reducing the loss of lives, livelihoods and health. A formal mechanism should be identified for the different

frameworks set of indicators to feed each other aiming at monitoring progress towards resilience.

### **Capacity development**

1. Capacity development should be preceded by an analysis of the state of the art of risk assessment and loss reporting in each country. There should be disaster risk management framework/strategy that would implement a number of steps.
  - a) acknowledge the need for risk assessments and modelling and the type of modelling required;
  - b) setting up information system that provide the information layers and the modelling framework,
  - c) implement modelling and that need to be followed by an evaluation by decision makers.
2. Loss data recording should be included in this framework. The different actors should be clearly identified, this includes the decision makers, the data base owner, the curator, the network of data field teams and other data providers must be clearly identified. Similarly the actors involved in risk modelling should be clearly mapped out to understand the areas not covered aiming at an improving comprehensive risk modelling.
3. Funding should be provided for training the practitioners and the institutions that request it. Disaster awareness through training should be provided at all levels and for all stakeholders. At national level it should be aimed at ministries and decision makers, at sub-national level at practitioners. At local level it should be centred at the municipality level and introduced in curricula of primer education programmes. Training should be foreseen also for the general public at large.
4. UNISDR should promote capacity development for those countries that are improving their loss data collection. The private sector should be more involved following best practice examples.
5. UNSIDR should lead the network to facilitate integration and capacity development by creating an advisory board at regional level (i.e. UNECLAC, UNESCAP, UNECE, EU) and organize at least two annual meetings over the 2015-2030 period.

### **Knowledge sharing**

The institutions and countries with good practices should share their knowledge with countries less prepared for the Sendai Framework reporting. This relates to all level and for all activities from hazard modelling, developing exposure database and modelling disaster risk including modelling for risk financing.

## **Data management**

1. Countries should be encouraged to establish geospatial risk modelling databases that include loss data as well as exposure, hazard and vulnerability. Those alone can be used to run disaster models including - the probabilistic models used for disaster financing - that will assess the risk of future disasters. Academia as well as the private sector should be involved.
2. An agreement should be reached on the public disclosure of loss statistics to a level that is useful, this for both public and private owned loss data. Exposure, both physical and human should also be available.
3. An alliance of regional and international organization should be established to assemble exposure, vulnerability loss and hazard data for national, continental and global modelling. Those organizations may act as regional focal point for scientific technical support to the countries that request it. That continental and global modelling should be conducted by tasked research centres that can cooperate and compare models and results at different scales.

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- United Nations Conference on Housing and Sustainable Urban Development (Habitat III) <<http://unhabitat.org/habitat-iii-conference/>>

## Annex: Relevant text from the Sendai Framework

- A. **SENDAI seven targets are listed in Paragraph 18 as follows:** “To support the assessment .... The seven global targets are:
- a) Substantially reduce global disaster mortality by 2030, aiming to lower the average per 100,00 global mortality rate in the decade 2020-2030 compared to the period 2005-2015.
  - b) Substantially reduce the number of affected people globally by 2030, aiming to lower the average global figure per 100,000 in the decade 202-2030 compared to the period 2005-2015
  - c) Reduce direct disaster economic loss in relation to global gross domestic product (GDP) by 2030;
  - d) Substantially reduce disaster damage to critical infrastructure and disruption of basic services, among them health and educational facilities, including through developing their resilience by 2030.
  - e) Substantially increase the number of countries with national and local disaster risk reduction strategies of this framework by 2030
  - f) Substantially enhance international cooperation to developing countries through adequate and sustainable support to complement their national actions for implementation of this Framework by 2030;
  - g) Substantially increase the availability of an access to multi-hazard early warning system and disaster risk information and assessments to the people by 2030.”

**B. The science and technology call for support is listed under Priority 1. Understanding disaster risk section and specifically in National and local levels (paragraph 24) [ not reported] and Global and regional levels (paragraph 25) .**

**14** - Against this background, and in order to reduce disaster risk, there is a need to address existing challenges and prepare for future ones by focusing on monitoring, assessing and understanding disaster risk and sharing such information and on how it is created; strengthening disaster risk governance and coordination across relevant institutions and sectors and the full and meaningful participation of relevant stakeholders at appropriate levels; investing in the economic, social, health, cultural and educational resilience of persons, communities and countries and the environment, as well as through technology and research; and enhancing multi-hazard early warning systems, preparedness, response, recovery, rehabilitation and reconstruction. To complement national action and capacity, there is a need to enhance international cooperation between developed and developing countries and between States and international organizations.

**25a** - To enhance the development and dissemination of science-based methodologies and tools to record and share disaster losses and relevant disaggregated data and statistics, as well as to strengthen disaster risk modelling, assessment, mapping, monitoring and multi-hazard early warning systems;

**28f** - To promote the strengthening of, as appropriate, international voluntary mechanisms for monitoring and assessment of disaster risks, including relevant data and information, benefiting from the experience of the Hyogo Framework for Action Monitor. Such mechanisms may promote the exchange of non-sensitive information on disaster risks to the relevant national Government bodies and stakeholders in the interest of sustainable social and economic development.

**26** - Supporting the development of coherent global and regional follow-up and indicators, and in coordination, as appropriate, with other relevant mechanisms for sustainable development and climate change, and updating the existing web-based Hyogo Framework for Action Monitor accordingly; participating actively in the work of the Inter-Agency and Expert Group on Sustainable Development Goal Indicators; generating evidence-based and practical guidance for implementation in close collaboration with States and through the mobilization of experts; reinforcing a culture of prevention among relevant stakeholders through supporting development of standards by experts and technical organizations, advocacy initiatives and dissemination of disaster risk information, policies and practices, as well as by providing education and training on disaster risk reduction through affiliated organizations; supporting countries, including through national platforms or their equivalent, in their development of national plans and monitoring trends and patterns in disaster risk, loss and impacts; convening the Global Platform for Disaster Risk Reduction and supporting the organization of regional platforms for disaster risk reduction in cooperation with regional organizations; leading the revision of the United Nations Plan of Action on Disaster Risk Reduction for Resilience; facilitating the enhancement of, and continuing to service, the United Nations Office for Disaster Risk Reduction Scientific and Technical Advisory Group in mobilizing science and technical work on disaster risk reduction; leading, in close coordination with States, the update of the publication entitled “2009 UNISDR Terminology on Disaster Risk Reduction”, in line with the terminology agreed upon by States; and maintaining the stakeholders’ commitment registry;

**19g** - Disaster risk reduction requires a multi-hazard approach and inclusive risk-informed decision-making based on the open exchange and dissemination of disaggregated data, including by sex, age and disability, as well as on easily accessible, up-to-date, comprehensible, science-based, non-sensitive risk information, complemented by traditional knowledge;

**24a** - To promote the collection, analysis, management and use of relevant data and practical information and ensure its dissemination, taking into account the needs of different categories of users, as appropriate;

**24d** - To systematically evaluate, record, share and publicly account for disaster losses and understand the economic, social, health, education, environmental and cultural heritage

impacts, as appropriate, in the context of event-specific hazard-exposure and vulnerability information;

**24f** - To promote real time access to reliable data, make use of space and in situ information, including geographic information systems (GIS), and use information and communications technology innovations to enhance measurement tools and the collection, analysis and dissemination of data;

**27g** - To establish and strengthen government coordination forums composed of relevant stakeholders at the national and local levels, such as national and local platforms for disaster risk reduction, and a designated national focal point for implementing the Sendai Framework for Disaster Risk Reduction 2015–2030. It is necessary for such mechanisms to have a strong foundation in national institutional frameworks with clearly assigned responsibilities and authority to, inter alia, identify sectorial and multisectoral disaster risk, build awareness and knowledge of disaster risk through sharing and dissemination of non-sensitive disaster risk information and data, contribute to and coordinate reports on local and national disaster risk, coordinate public awareness campaigns on disaster risk, facilitate and support local multisectoral cooperation (e.g. among local governments) and contribute to the determination of and reporting on national and local disaster risk management plans and all policies relevant for disaster risk management. These responsibilities should be established through laws, regulations, standards and procedures;

**28f** - To promote the strengthening of, as appropriate, international voluntary mechanisms for monitoring and assessment of disaster risks, including relevant data and information, benefiting from the experience of the Hyogo Framework for Action Monitor. Such mechanisms may promote the exchange of non-sensitive information on disaster risks to the relevant national Government bodies and stakeholders in the interest of sustainable social and economic development.

**33n** - To establish a mechanism of case registry and a database of mortality caused by disaster in order to improve the prevention of morbidity and mortality;

**36c** - Business, professional associations and private sector financial institutions, including financial regulators and accounting bodies, as well as philanthropic foundations, to integrate disaster risk management, including business continuity, into business models and practices through disaster-risk-informed investments, especially in micro, small and medium-sized enterprises; engage in awareness-raising and training for their employees and customers; engage in and support research and innovation, as well as technological development for disaster risk management; share and disseminate knowledge, practices and non-sensitive data; and actively participate, as appropriate and under the guidance of the public sector, in the development of normative frameworks and technical standards that incorporate disaster risk management;

**48c** - The United Nations Office for Disaster Risk Reduction, in particular, to support the implementation, follow-up and review of the present Framework by: preparing periodic reviews on progress, in particular for the Global Platform for Disaster Risk Reduction, and, as appropriate, in a timely manner, along with the follow-up process at the United Nations.