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Item 19 (c) Sustainable development: Disaster risk reduction

Report of the Open-ended intergovernmental expert working group on indicators and terminology relating to disaster risk reduction

(Geneva, 29-30 September 2015, 10-11 February 2016 and 15 & 18 November 2016)

Note by the Secretary-General

The Secretary-General has the honour to transmit herewith the report of the Open-ended intergovernmental expert working group on indicators and terminology relating to disaster risk reduction established by the General Assembly in its resolution [69/284](#) for the development of a set of possible indicators to measure global progress in the implementation of the Sendai Framework for Disaster Risk Reduction 2015-2030¹, coherent with the work of the Inter-Agency and Expert Group on Sustainable Development Goal Indicators, and the update of the publication entitled “2009 UNISDR Terminology on Disaster Risk Reduction”.

¹ Resolution 69/283, annex II.



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I. Introduction

1. By its resolution 69/284 of 3 June 2015, the General Assembly established an open-ended intergovernmental expert working group comprising experts nominated by States and supported by the United Nations Office for Disaster Risk Reduction, with the involvement of relevant stakeholders, for the development of a set of possible indicators to measure global progress in the implementation of the Sendai Framework for Disaster Risk Reduction 2015-2030, coherent with the work of the Inter-Agency and Expert Group on Sustainable Development Goal Indicators; decided that the working group shall consider, as appropriate, the recommendations of the Scientific and Technical Advisory Group of the United Nations Office for Disaster Risk Reduction on the update of the publication entitled “2009 UNISDR Terminology on Disaster Risk Reduction”; and decided that the work of the working group shall be completed by December 2016 and its report submitted to the General Assembly for consideration.

II. Organizational matters

A. Opening and duration of the sessions

2. The Working Group held its first session from 29 to 30 September 2015, its second session from 10 to 11 February 2016, and its third session on 15 and 18 November 2016 in Geneva, Switzerland.

3. The first session was opened by the Special Representative of the Secretary-General for Disaster Risk Reduction. At the first meeting on 29 September 2015, the Special Representative of the Secretary-General for Disaster Risk Reduction made a statement.

4. The second and third sessions were opened by the Chair of the Working Group (see para. 7). The Special Representative of the Secretary-General for Disaster Risk Reduction also made a statement at the first meeting of each session.

5. The United Nations Office for Disaster Risk Reduction provided substantive support to the Working Group. The Disarmament and Peace Affairs Branch of the Department for General Assembly and Conference Management served as Secretary of the Working Group.

B. Attendance

6. The list of the nominated experts and delegates and other stakeholders registered for the Working Group is included as an annex to the present report.

C. Officers

7. At its first meeting of the first session, on 29 September 2015, the Working Group elected H.E. Mr. Wayne McCook (Jamaica) as Chair by acclamation.

D. Adoption of the Agenda

8. At the same meeting, the Working Group adopted the agenda, as contained in document A/AC.285/1, for all its sessions. The agenda reads as follows:

1. Election of officers.

2. Adoption of the agenda and other organizational matters.
 3. Indicators to measure global progress in the implementation of the Sendai Framework for Disaster Risk Reduction 2015-2030.
 4. Disaster risk reduction terminology.
 5. Other matters.
 6. Adoption of the report.
9. At the same meeting, in accordance with paragraph 7 of General Assembly resolution 69/284, the Working Group decided on the modalities for the participation of relevant bodies and organizations of the United Nations system, as well as relevant intergovernmental and non-governmental organizations and other stakeholders.

E. Organization of work

10. Also at the same meeting, the Working Group approved its calendar and programme of work, as contained in document A/AC.285/2, in accordance with paragraph 5(b) of General Assembly resolution 69/284. Changes in the calendar and programme of work were communicated through the website of the Working Group (<http://www.preventionweb.net/drr-framework/open-ended-working-group/>).

F. Documentation

11. The Working Group had before it the following documents:
- (a) Provisional agenda (A/AC.285/1);
 - (b) Provisional calendar and programme of work (A/AC.285/2);
 - (c) Report of the Chair of the Open-ended Intergovernmental Expert Working Group on Indicators and Terminology relating to Disaster Risk Reduction on Results of informal consultations from February to November 2016 on indicators and terminology relating to Disaster Risk Reduction (A/AC.285/CRP.1);
 - (d) Recommendations of the Open-ended Intergovernmental Expert Working Group on Indicators and Terminology relating to Disaster Risk Reduction (A/AC.285/CRP.2 and A/AC.285/CRP.2/Rev.1-3).

G. Proceedings of the Working Group

12. At its first session, the Working Group considered agenda items 1, 2, 3, 4 and 5 at its plenary meetings. The session was preceded by one-day informal meetings.
13. At its second session, the Working Group considered agenda item 3 and 5 at its plenary meetings and decided to defer its consideration of item 4 to the next session. The session was preceded by one-day informal meetings.
14. At its third session, the Working Group considered agenda items 3, 4, 5 and 6 at its plenary meetings. The Working Group also held informal meetings from 14 to 18 November 2016.

15. During the inter-sessional periods, the Chair of the Working Group conducted a series of informal consultations in Geneva with the participation of delegates and experts in other locations through WebEx on 20-21 June, 10-11 October, 9 and 14 November 2016.

16. In accordance with paragraph 7 of General Assembly resolution 69/284, contributions were also made to the work of the Working Group by relevant bodies and organizations of the United Nations system, as well as relevant intergovernmental and non-governmental organizations and other stakeholders, the last category of which consisted of civil society organizations; local governments; private sector; and academia and scientific institutions.

17. The Working Group discussed questions related to the definition of global indicators to effectively measure progress toward the achievement of the seven global targets of the Sendai Framework for Disaster Risk Reduction and, as relevant, the SDGs, as well as of suitable terminology related to disaster risk reduction to facilitate the implementation of the Sendai Framework for Disaster Risk Reduction and foster cooperation across nations, sectors and stakeholders. Furthermore, the Working Group discussed questions related to the implementation and use of the global indicators, including States' data readiness review, data disaggregation, baselines definition, and development of technical guidance for the use of the Sendai Framework Monitor as well as the importance of reporting on disaster risk investments.

III. Adoption of the report

18. At its third meeting of the third session, on 18 November 2016, the Working Group considered agenda item 6, entitled "Adoption of the report" and adopted its report as contained in document A/AC.285/L.1 as orally revised and its recommended indicators for the global targets of the Sendai Framework for Disaster Risk Reduction 2015-2030, the follow-up to and operationalization of the indicators and its recommended terminology relating to disaster risk reduction as contained in the annexes to document A/AC.285/CRP.2/Rev.3, as orally revised. The Working Group also agreed to submit the recommendations to the General Assembly at its seventy-first session for its consideration and appropriate action.

19. At the same meeting, an explanation of position was made by the representative of the United States. Expressing gratitude to the OIEWG Chair, UNISDR as well as Member States experts and other stakeholders for their extensive engagement in the working group, the United States noted that it strongly supports disaster risk reduction and remains committed to working with the international community toward the common goal of reducing disaster risk and building resilience worldwide. It joined consensus on the adoption of the Sendai Framework but issued an Explanation of Position (EOP) underscoring its concerns and dissociating from certain paragraphs, including those on financing, international cooperation, and the transfer of technology. It maintains the concerns set forth in its EOP on the Sendai Framework.

IV. Recommendations of the Open-ended intergovernmental expert working group on global indicators for the global targets of the Sendai Framework for Disaster Risk Reduction 2015-2030 and the follow-up to and operationalization of the indicators

Global Target A: Substantially reduce global disaster mortality by 2030, aiming to lower average per 100,000 global mortality between 2020-2030 compared to 2005-2015.	
A-1 (compound)	Number of deaths and missing persons attributed to disasters, per 100,000 population.
A-2	Number of deaths attributed to disasters, per 100,000 population.
A-3	Number of missing persons attributed to disasters, per 100,000 population.
	<i>The scope of disaster in this and subsequent targets is defined in paragraph 15 of the SFDRR and applies to small-scale and large-scale, frequent and infrequent, sudden and slow-onset disasters caused by natural or man-made hazards, as well as related environmental, technological and biological hazards and risk.</i>

Global Target B: Substantially reduce the number of affected people globally by 2030, aiming to lower the average global figure per 100,000 between 2020-2030 compared to 2005-2015.	
B-1 (compound)	Number of directly affected people attributed to disasters, per 100,000 population.
B-2	Number of injured or ill people attributed to disasters, per 100,000 population.
B-3	Number of people whose damaged dwellings were attributed to disasters.
B-4	Number of people whose destroyed dwellings were attributed to disasters.
B-5	Number of people whose livelihoods were disrupted or destroyed, attributed to disasters.

Global Target C: Reduce direct disaster economic loss in relation to global gross domestic product (GDP) by 2030.	
C-1 (compound)	Direct economic loss attributed to disasters in relation to global gross domestic product.
C-2	Direct agricultural loss attributed to disasters. <i>Agriculture is understood to include the crops, livestock, fisheries, apiculture, aquaculture and forest sectors as well as associated facilities and infrastructure.</i>

Draft final report of the Open-ended intergovernmental expert working group on indicators and terminology relating to disaster risk reduction (unedited English version)

C-3	<p>Direct economic loss to all other damaged or destroyed productive assets attributed to disasters.</p> <p><i>Productive assets would be disaggregated by economic sector, including services, according to standard international classifications. Countries would report against those economic sectors relevant to their economies. This would be described in the associated metadata.</i></p>
C-4	<p>Direct economic loss in the housing sector attributed to disasters.</p> <p><i>Data would be disaggregated according to damaged and destroyed dwellings</i></p>
C-5	<p>Direct economic loss resulting from damaged or destroyed critical infrastructure attributed to disasters.</p> <p><i>Those elements of critical infrastructure to be included in the calculation will be at the decision of Member States and described in the accompanying metadata. Protective infrastructure and green infrastructure should be included where relevant.</i></p>
C-6	<p>Direct economic loss to cultural heritage damaged or destroyed attributed to disasters.</p>

<p>Global Target 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.</p>	
D-1 (compound)	Damage to critical infrastructure attributed to disasters.
D-2	Number of destroyed or damaged health facilities attributed to disasters.
D-3	Number of destroyed or damaged educational facilities attributed to disasters.
D-4	<p>Number of other destroyed or damaged critical infrastructure units and facilities attributed to disasters.</p> <p><i>Those elements of critical infrastructure to be included in the calculation will be at the decision of Member States and described in the accompanying metadata. Protective infrastructure and green infrastructure should be included where relevant.</i></p>
D-5 (compound)	Number of disruptions to basic services attributed to disasters.
D-6	Number of disruptions to educational services attributed to disasters.

D-7	Number of disruptions to health services attributed to disasters.
D-8	Number of disruptions to other basic services attributed to disasters. <i>Those elements of basic services to be included in the calculation will be at the decision of Member States and described in the accompanying metadata.</i>

Global Target E: Substantially increase the number of countries with national and local disaster risk reduction strategies by 2020.

E-1	Number of countries that adopt and implement national disaster risk reduction strategies in line with the Sendai Framework for Disaster Risk Reduction 2015-2030.
E-2	Percentage of local governments that adopt and implement local disaster risk reduction strategies in line with national strategies. <i>Information should be provided on the appropriate levels of government below the national level with responsibility for disaster risk reduction.</i>

Global Target 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.

F-1	Total official international support, (ODA plus other official flows), for national DRR actions. <i>Reporting of the provision or receipt of international cooperation for DRR shall be done in accordance with the modalities applied in respective countries. Recipient countries are encouraged to provide information on the estimated amount of national DRR expenditure.</i>
F-2	Total official international support (ODA plus other official flows) for national DRR actions provided by multilateral agencies.
F-3	Total official international support (ODA plus other official flows) for national DRR actions provided bilaterally.
F-4	Total official international support (ODA plus other official flows) for the transfer and exchange of DRR related technology.
F-5	Number of international, regional and bilateral programmes and initiatives for the transfer and exchange of science, technology and innovation in disaster risk reduction for developing countries.
F-6	Total official international support (ODA plus other official flows)

	for disaster risk reduction capacity building.
F-7	Number of international, regional and bilateral programmes and initiatives for DRR related capacity building in developing countries.
F-8	Number of developing countries supported by international, regional, bilateral initiatives to strengthen their DRR related statistical capacity.

Global Target G: Substantially increase the availability of and access to multi-hazard early warning systems and disaster risk information and assessments to the people by 2030.

G-1 (compound G2 – G5)	Number of countries that have multi-hazard early warning systems.
G-2	Number of countries that have multi-hazard monitoring and forecasting systems.
G-3	Number of people per 100,000 that are covered by early warning information through local governments or through national dissemination mechanisms.
G-4	Percentage of local governments having a plan to act on early warnings.
G-5	Number of countries that have accessible, understandable, usable and relevant disaster risk information and assessment available to the people at the national and local level.
G-6	Percentage of population exposed or at risk from disasters protected through pre-emptive evacuation following early warning.

Footnote to indicator G-6: Member States in a position to do so are encouraged to provide information on the number of evacuated people.

Follow-up and operationalization of the indicators

1. In order to support member States with the operationalization of the global indicators to measure progress towards the achievement of the Global Targets of the Sendai Framework for Disaster Risk Reduction: 2015-2030 (SFDRR) and relevant Targets of the Sustainable Development Goals, the United Nations Office for Disaster Risk Reduction (UNISDR) is requested to undertake technical work and provide technical guidance to:

- a) develop minimum standards and metadata for disaster-related data, statistics and analysis with the engagement of national government focal points, national DRR offices, national statistical offices, UNDESA and other relevant partners;

- b) develop methodologies for the measurement of indicators and processing of statistical data, with relevant technical partners;
 - c) provide member States with technical support, upon request, to conduct a review of data readiness with respect to the indicators in order to establish the baseline for monitoring and prepare for the first biennial cycle of review of the SFDRR; and
 - d) develop technical guidance material, for the testing and roll-out of the indicators and the web-based monitoring system, the Sendai Framework Monitor.
2. It is also recognized that the Global Platform for Disaster Risk Reduction and the Regional Platforms for Disaster Risk Reduction, supported by UNISDR, will play a critical role in validating biennial assessments of progress toward the achievement of the seven Global Targets of the SFDRR and relevant disaster risk related Targets of the SDGs. The role of national platforms will also be important.
3. While the Global Targets of the SFDRR do not explicitly call for data disaggregation, Guiding Principle 19(g) of the Sendai Framework for Disaster Risk Reduction does call for specific attention to factors such as income, sex, age and disability in disaster risk reduction. As such the collection of disaggregated data should be considered as instrumental to the effective implementation of the SFDRR and relevant disaster risk related Targets of the SDGs.
4. At the same time, the Open-ended intergovernmental expert working group on indicators and terminology relating to disaster risk reduction (OIEWG), recognizing the different existing capacities of member States in data collection and reporting, noted that indicators, in order to be considered as global, need to be usable by all member States. As such, while data disaggregation may be highly desirable, it was noted that this may not be immediately feasible across all member States, and as such could not be considered a requirement in relevant indicators. The OIEWG encourages member States to commence or, as appropriate, further enhance the collection of data on disaster loss disaggregated by income, sex, age and disability with the engagement of the national statistical offices and in accordance with the Fundamental Principles of Official Statistics, and to start reporting disaggregated data. It also calls for actions under Target F of the SFDRR to strengthen national capacities to do so.
5. The OIEWG, when assessing the feasibility of indicators proposed for measuring progress towards the Global Targets of the SFDRR identified relevant indicators for which internationally recognized methodologies are available but for which a significant number of countries currently do not collect the necessary data. These indicators considered as optional or aspirational could not be selected by the OIEWG for global measurement and application. However, some member States recommended that these indicators could be applied at the national level by those countries that have the necessary data in order to enhance their assessment of progress. They also highlighted the importance to continue further discussion on Sendai Framework implementation and to provide additional information to UNISDR on other nationally identified relevant indicators related to Disaster Risk Reduction, as appropriate.
6. The methodologies for measuring the indicators and processing of statistical data that will be provided as technical guidance by UNISDR would allow for consistent measurement of progress towards the Global Targets across countries and over the duration of the SFDRR and SDGs. Countries may choose to use a national methodology or other methods of measurement and calculation. It is recommended that countries keep the metadata consistent if the methodology is changed.

V. Recommendations of the Open-ended intergovernmental expert working group on terminology relating to disaster risk reduction

Affected

People who are affected, either directly or indirectly, by a hazardous event. Directly affected are those who have suffered injury, illness or other health effects; who were evacuated, displaced, relocated or have suffered direct damage to their livelihoods, economic, physical, social, cultural and environmental assets. Indirectly affected are people who have suffered consequences, other than or in addition to direct effects, over time due to disruption or changes in economy, critical infrastructures, basic services, commerce, work or social, health and psychological consequences.

Annotation: People can be affected directly or indirectly. Affected people may experience short-term or long-term consequences to their lives, livelihoods or health and in the economic, physical, social, cultural and environmental assets. In addition, people who are missing or dead may be considered as directly affected.

Build Back Better

The use of the recovery, rehabilitation and reconstruction phases after a disaster to increase the resilience of nations and communities through integrating disaster risk reduction measures into the restoration of physical infrastructure and societal systems, and into the revitalisation of livelihoods, economies, and the environment.

Annotation: The term 'societal' will not be interpreted as political system of any country.

Building code

A set of ordinances or regulations and associated standards intended to regulate aspects of the design, construction, materials, alteration and occupancy of structures which are necessary to ensure human safety and welfare, including resistance to collapse and damage.

Annotation: Building codes can include both technical and functional standards. They should incorporate the lessons of international experience and should be tailored to national and local circumstances. A systematic regime of enforcement is a critical supporting requirement for effective implementation of building codes.

Capacity

The combination of all the strengths, attributes and resources available within an organization, community or society to manage and reduce disaster risks and strengthen resilience.

Annotation: Capacity may include infrastructure, institutions, human knowledge and skills, and collective attributes such as social relationships, leadership and management.

Coping capacity is the ability of people, organizations and systems, using available skills and resources, to manage adverse conditions, risk or disasters. The capacity to cope requires continuing awareness, resources and good management, both in normal times as well as during disasters or adverse conditions. Coping capacities contribute

to the reduction of disaster risks.

Capacity assessment is the process by which the capacity of a group, organisation or society is reviewed against desired goals, where existing capacities are identified for maintenance or strengthening, and the capacity gaps are identified for further action.

Capacity development is the process by which people, organizations and society systematically stimulate and develop their capacities over time to achieve social and economic goals. It is a concept that extends the term of capacity building to encompass all aspects of creating and sustaining capacity growth over time. It involves learning and various types of training, but also continuous efforts to develop institutions, political awareness, financial resources, technology systems, and the wider enabling environment.

Contingency planning

A management process that analyses disaster risks and establishes arrangements in advance to enable timely, effective and appropriate responses.

Annotation: Contingency planning results in organized and coordinated courses of action with clearly identified institutional roles and resources, information processes, and operational arrangements for specific actors at times of need. Based on scenarios of possible emergency conditions or hazardous events, it allows key actors to envision, anticipate and solve problems that can arise during disasters. Contingency planning is an important part of overall preparedness. Contingency plans need to be regularly updated and exercised.

Critical infrastructure

The physical structures, facilities, networks and other assets which provide services that are essential to the social and economic functioning of a community or society.

Disaster

A serious disruption of the functioning of a community or a society at any scale due to hazardous events interacting with conditions of exposure, vulnerability and capacity, leading to one or more of the following: human, material, economic and environmental losses and impacts.

Annotations: The effect of the disaster can be immediate and localised, but is often widespread and could last for a long period of time. The effect may test or exceed the capacity of a community or society to cope using its own resources, and therefore may require assistance from external sources, which could include neighbouring jurisdictions, or national or international levels.

Emergency is sometimes used interchangeably with the term disaster, as for example in the context of biological and technological hazards or health emergencies, which however can also relate to hazardous events that do not result in the serious disruption of the functioning of a community or society.

Disaster damage occurs during and immediately after the disaster. This is usually measured in physical units (e.g. square meters of housing, kilometres of roads, etc.), and describes the total or partial destruction of physical assets, disruption of basic services and damages to sources of livelihood in the affected area.

Disaster impact is the total effect, including negative (e.g. economic losses) effects and positive (e.g. economic gains) effects, of a hazardous event or a disaster. The term

includes economic, human and environmental impacts, and may include death, injuries, disease and other negative effects on human physical, mental and social well-being.

For the purpose of the scope of the Sendai framework (paragraph 15) the following terms are also considered:

- *Small-scale disaster: A type of disaster only affecting local communities which require assistance beyond the affected community.*
- *Large-scale disaster: A type of disaster affecting a society, which requires national or international assistance.*
- *Frequent and infrequent disasters: depend on the probability of occurrence and the return period of a given hazard and its impacts. The impact of frequent disasters could be cumulative, or become chronic for a community or a society.*
- *A slow-onset disaster is defined as one that emerges gradually over time. Slow-onset disasters could be associated with e.g. drought, desertification, sea level rise, epidemic disease.*

A sudden-onset disaster is one triggered by a hazardous event that emerges quickly or unexpectedly. Sudden-onset disasters could be associated with e.g. earthquake, volcanic eruption, flash flood, chemical explosion, critical infrastructure failure, transport accident.

Disaster loss database

A set of systematically collected records about disaster occurrence, damages, losses and impacts, compliant with the Sendai Framework monitoring minimum requirements.

Disaster management

The organization, planning and application of measures preparing for, responding to and recovering from disasters.

Annotation: Disaster management may not completely avert or eliminate the threats; it focuses on creating and implementing preparedness and others plans to decrease the impact of disasters and Build Back Better. Failure to create and apply a plan could lead to damage to life, assets and lost revenue.

Emergency management is also used, sometimes interchangeably with the term disaster management, particularly in the context of biological and technological hazards and for health emergencies. While there is a large degree of overlap, an emergency can also relate to hazardous events that do not result in the serious disruption of the functioning of a community or society.

Disaster risk

The potential loss of life, injury, destroyed or damaged assets which could occur to a system, society or a community in a specific period of time, determined probabilistically as a function of hazard, exposure, vulnerability and capacity.

Annotation: The definition of disaster risk reflects the concept of hazardous events and disasters as the outcome of continuously present conditions of risk. Disaster risk comprises different types of potential losses which are often difficult to quantify. Nevertheless, with knowledge of the prevailing hazards and the patterns of population and socio-economic development, disaster risks can be assessed and mapped, in broad terms at least.

It is important to consider the social and economic contexts in which disaster risks occur and that people do not necessarily share the same perceptions of risk and their underlying risk factors.

Acceptable risk, or tolerable risk, is therefore an important sub-term; the extent to which a disaster risk is deemed acceptable or tolerable depends on existing social, economic, political, cultural, technical and environmental conditions. In engineering terms, acceptable risk is also used to assess and define the structural and non-structural measures that are needed in order to reduce possible harm to people, property, services and systems to a chosen tolerated level, according to codes or "accepted practice" which are based on known probabilities of hazards and other factors.

Residual risk is the disaster risk that remains even when effective disaster risk reduction measures are in place, and for which emergency response and recovery capacities must be maintained. The presence of residual risk implies a continuing need to develop and support effective capacities for emergency services, preparedness, response and recovery together with socio-economic policies such as safety nets and risk transfer mechanisms, as part of a holistic approach.

Disaster risk assessment

A qualitative or quantitative approach to determine the nature and extent of disaster risk by analysing potential hazards and evaluating existing conditions of exposure and vulnerability that together could harm people, property, services, livelihoods and the environment on which they depend.

Annotation: Disaster risk assessments include: the identification of hazards, a review of the technical characteristics of hazards such as their location, intensity, frequency and probability; the analysis of exposure and vulnerability including the physical, social, health, environmental and economic dimensions, and the evaluation of the effectiveness of prevailing and alternative coping capacities in respect to likely risk scenarios.

Disaster risk governance

The system of institutions, mechanisms, policy and legal frameworks and other arrangements to guide, coordinate and oversee disaster risk reduction and related areas of policy.

Annotation: Good governance needs to be transparent, inclusive, collective, and efficient to reduce existing disaster risks and avoid creating new ones.

Disaster risk information

Comprehensive information on all dimensions of disaster risk including hazards, exposure, vulnerability and capacity related to persons, communities, organizations and countries and their assets.

Annotation: Disaster risk information includes all studies, information and mapping required to understand the disaster risk drivers and underlying risk factors.

Disaster risk management

Disaster risk management is the application of disaster risk reduction policies and strategies to prevent new disaster risk, reduce existing disaster risk and manage residual risk, contributing to the strengthening of resilience and reduction of

disaster losses.

Annotation: Disaster risk management actions can be distinguished between prospective disaster risk management, corrective disaster risk management, and compensatory disaster risk management, also called residual risk management.

Prospective disaster risk management activities address and seek to avoid the development of new or increased disaster risks. They focus on addressing disaster risks that may develop in future if disaster risk reduction policies are not put in place; examples are better land-use planning or disaster-resistant water supply systems.

Corrective disaster risk management activities address and seek to remove or reduce disaster risks which are already present and which need to be managed and reduced now. Examples are the retrofitting of critical infrastructure or the relocation of exposed populations or assets.

Compensatory disaster risk management activities strengthen the social and economic resilience of individuals and societies in the face of residual risk that cannot be effectively reduced. They include preparedness, response and recovery activities, but also a mix of different financing instruments, such as national contingency funds, contingent credit, insurance and reinsurance, and social safety nets.

Community Based disaster risk management promotes the involvement of potentially affected communities in disaster risk management at the local level. This includes community assessments of hazards, vulnerabilities and capacities, and their involvement in planning, implementation, monitoring and evaluation of local action for disaster risk reduction.

Local and indigenous peoples approach to disaster risk management is the recognition and use of traditional, indigenous and local knowledge and practices to complement scientific knowledge in disaster risk assessments and for the planning and implementation of local disaster risk management.

Disaster risk management plans set out the goals and specific objectives for reducing disaster risks together with related actions to accomplish these objectives. They should be guided by the Sendai Framework and considered and coordinated within relevant development plans, resource allocations and programme activities. National level plans need to be specific to each level of administrative responsibility and adapted to the different social and geographical circumstances that are present. The time frame and responsibilities for implementation and the sources of funding should be specified in the plan. Linkages to sustainable development and climate change adaptation plans should be made where possible.

Disaster risk reduction

Disaster risk reduction is aimed at preventing new and reducing existing disaster risk and managing residual risk, all of which contributes to strengthening resilience and therefore to the achievement of sustainable development.

Annotation: Disaster risk reduction is the policy objective of disaster risk management and its goals and objectives are defined in disaster risk reduction strategies and plans.

Disaster risk reduction strategies and policies define goals and objectives across different timescales and with concrete targets, indicators and time frames. In line with the Sendai Framework, these should be aimed at preventing the creation of disaster risk, the reduction of existing risk and the strengthening of economic, social, health and environmental resilience.

A global, agreed policy of disaster risk reduction is set out in the United Nations' endorsed "Sendai Framework for Disaster Risk Reduction 2015-2030", adopted in March 2015, whose expected outcome over the next 15 years is: "The substantial reduction of disaster risk and losses in lives, livelihoods and health and in the economic, physical, social, cultural and environmental assets of persons, businesses, communities and countries".

Early warning system

An integrated system of hazard monitoring, forecasting and prediction, disaster risk assessment, communication and preparedness activities systems and processes that enables individuals, communities, governments, businesses and others to take timely action to reduce disaster risks in advance of hazardous events.

Annotations: Effective "end-to-end" and "people-centred" early warning system may include four interrelated key elements: 1) disaster risk knowledge based on the systematic collection of data and disaster risk assessments; 2) detection, monitoring, analysis and forecasting of the hazards and possible consequences; 3) dissemination and communication by an official source, of authoritative, timely, accurate and actionable warnings and associated information on likelihood and impact; and 4) preparedness at all levels to respond to the warnings received. These four interrelated components need to be coordinated within and across sectors and multiple levels for the system to work effectively and to include feedback mechanism for continuous improvement. Failure in one component or lack of coordination across them could lead to the failure of the whole system.

Multi-hazard early warning systems address several hazards and/or impacts of similar or different type in contexts where hazardous events may occur alone, simultaneously, cascadingly or cumulatively over time, and taking into account the potential inter-related effects. A multi-hazard early warning system with the ability to warn of one or more hazards increases the efficiency and consistency of warnings through coordinated and compatible mechanisms and capacities, involving multiple disciplines for updated and accurate hazards identification and monitoring for multiple hazards.

Economic loss

Total economic impact that consists of direct economic loss and indirect economic loss.

Direct economic loss: the monetary value of total or partial destruction of physical assets existing in the affected area. Direct economic loss is nearly equivalent to

<p>physical damage.</p> <p>Indirect economic loss: a decline in economic value added as a consequence of direct economic loss and/or human and environmental impacts.</p> <p><i>Annotations: Example of physical assets that are the basis for calculating direct economic loss include homes, schools, hospitals, commercial and governmental buildings, transport, energy, telecommunications infrastructures and other infrastructure; business assets and industrial plants; production such as crops, livestock and production infrastructure. They may also encompass environmental assets and cultural heritage.</i></p> <p>Direct economic loss usually happen during the event or within the first few hours after the event and are often assessed soon after the event to estimate recovery cost and claim insurance payments. These are tangible and relatively easy to measure.</p> <p>Indirect economic loss includes micro-economic impacts (e.g. revenue declines owing to business interruption), meso-economic impacts (e.g. revenue declines owing to impacts on natural assets, interruptions to supply chains or temporary unemployment) and macro-economic impacts (e.g. price increases, increases in government debt, negative impact on stock market prices, and decline in GDP). Indirect losses can occur inside or outside of the hazard area and often with a time lag. As a result they may be intangible or difficult to measure.</p>
<p>Evacuation</p> <p>Moving people and assets temporarily to safer places before, during or after the occurrence of a hazardous event in order to protect them.</p> <p><i>Annotations: Evacuation plans refer to the arrangements established in advance to enable the moving of people and assets temporarily to safer places before, during or after the occurrence of a hazardous event. Evacuation plans may include plans for return of evacuees and options for shelter in place.</i></p>
<p>Exposure</p> <p>The situation of people, infrastructure, housing, production capacities and other tangible human assets located in hazard-prone areas.</p> <p><i>Annotation: Measures of exposure can include the number of people or types of assets in an area. These can be combined with the specific vulnerability and capacity of the exposed elements to any particular hazard to estimate the quantitative risks associated with that hazard in the area of interest.</i></p>
<p>Extensive disaster risk</p> <p>The risk of low-severity, high-frequency hazardous events and disasters, mainly but not exclusively associated with highly localized hazards.</p> <p><i>Annotation: Extensive disaster risk is usually high where communities are exposed to, and vulnerable to, recurring localised floods, landslides storms or drought. Extensive disaster risk is often exacerbated by poverty, urbanization and environmental degradation.</i></p>
<p>Hazard</p> <p>A process, phenomenon or human activity that may cause loss of life, injury or other health impacts, property damage, social and economic disruption or environmental</p>

degradation.

*Annotations: Hazards may be natural, anthropogenic or socio-natural in origin. **Natural hazards** are predominantly associated with natural processes and phenomena. **Anthropogenic hazards**, or human-induced hazards, are induced entirely or predominantly by human activities and choices. This term does not include the occurrence or risk of armed conflicts and other situations of social instability or tension which are subject to International Humanitarian Law and national legislation. Several hazards are **socio-natural** in that they are associated with a combination of natural and anthropogenic factors, including environmental degradation and climate change.*

Hazards may be single, sequential or combined in their origin and effects. Each hazard is characterised by its location, intensity or magnitude, frequency and probability. Biological hazards are also defined by their infectiousness or toxicity or other characteristics of the pathogen such as dose-response, incubation period, case fatality rate and estimation of the pathogen for transmission.

***Multi-hazard** means the (1) selection of multiple major hazards that the country faces, and (2) specific contexts where hazardous events may occur simultaneously, cascadingly or cumulatively over time, and taking into account the potential interrelated effects.*

Hazards include (as mentioned in the Sendai Framework for Disaster Risk Reduction and in alphabetical order) biological, environmental, geological, hydro-meteorological and technological processes and phenomena.

***Biological hazards** are of organic origin or conveyed by biological vectors, including pathogenic micro-organisms, toxins and bioactive substances. Examples are bacteria, viruses or parasites as well as venomous wildlife and insects, poisonous plants, and mosquitoes carrying disease-causing agents.*

***Environmental hazards** may include chemical, natural and biological hazards. They can be created by environmental degradation, physical or chemical pollution in the air, water and soil. However, many of the processes and phenomena that fall into this category may be termed drivers of hazard and risk rather than hazards in themselves, such as soil degradation, deforestation, loss of biodiversity, salinization and sea level rise.*

***Geological or geophysical hazards** originate from internal earth processes. Examples are earthquakes, volcanic activity and emissions, and related geophysical processes such as mass movements, landslides, rockslides, surface collapses, and debris or mud flows. Hydro-meteorological factors are important contributors to some of these processes. Tsunamis are difficult to categorize; although they are triggered by undersea earthquakes and other geological events, they essentially become oceanic process that is manifested as a coastal water-related hazard.*

***Hydro-meteorological hazards** are of atmospheric, hydrological or oceanographic origin. Examples are tropical cyclones (also known as typhoons and hurricanes), floods including flash floods, drought, heatwaves and cold spells and coastal storm surges. Hydro-meteorological conditions may also be a factor in other hazards such as landslides, wildland fires, locust plagues, epidemics, and in the transport and dispersal of toxic substances and volcanic eruption material.*

<p>Technological hazards originate from technological or industrial conditions, dangerous procedures, infrastructure failures or specific human activities. Examples include industrial pollution, nuclear radiation, toxic wastes, dam failures, transport accidents, factory explosions, fires and chemical spills. Technological hazards also may arise directly as a result of the impacts of a natural hazard event.</p>
<p>Hazardous event</p> <p>The manifestation of a hazard in a particular place during a particular period of time.</p> <p><i>Annotation: Severe hazardous events can lead to a disaster as a result of the combination of hazard occurrence and other risk factors.</i></p>
<p>Intensive disaster risk</p> <p>The risk of high-severity, mid to low-frequency disasters, mainly associated with major hazards.</p> <p><i>Annotation: Intensive disaster risk is mainly a characteristic of large cities or densely populated areas that are not only exposed to intense hazards such as strong earthquakes, active volcanoes, heavy floods, tsunamis, or major storms but also have high levels of vulnerability to these hazards.</i></p>
<p>Mitigation</p> <p>The lessening or minimising of the adverse impacts of a hazardous event.</p> <p><i>Annotation: The adverse impacts of hazards, in particular natural hazards, often cannot be prevented fully, but their scale or severity can be substantially lessened by various strategies and actions. Mitigation measures include engineering techniques and hazard-resistant construction as well as improved environmental and social policies and public awareness. It should be noted that in climate change policy, "mitigation" is defined differently, being the term used for the reduction of greenhouse gas emissions that are the source of climate change.</i></p>
<p>National platform for disaster risk reduction</p> <p>A generic term for national mechanisms for coordination and policy guidance on disaster risk reduction that are multi-sectoral and inter-disciplinary in nature, with public, private and civil society participation involving all concerned entities within a country.</p> <p><i>Annotations: Effective government coordination forums are composed of relevant stakeholders at national and local levels and have a designated national focal point. For such a mechanisms to have a strong foundation in national institutional frameworks further key element and responsibilities should be established through laws, regulations, standards and procedures, including: clearly assigned responsibilities and authority; 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 multi-sectoral cooperation (e.g. among local governments); contribute to the determination of and reporting on national and local disaster risk management plans and all policies relevant for disaster risk management.</i></p>

Preparedness

The knowledge and capacities developed by governments, response and recovery organizations, communities and individuals to effectively anticipate, respond to, and recover from, the impacts of likely, imminent or current disasters.

Annotation: Preparedness action is carried out within the context of disaster risk management and aims to build the capacities needed to efficiently manage all types of emergencies and achieve orderly transitions from response to sustained recovery.

Preparedness is based on a sound analysis of disaster risks and good linkages with early warning systems, and includes such activities as contingency planning, stockpiling of equipment and supplies, the development of arrangements for coordination, evacuation and public information, and associated training and field exercises. These must be supported by formal institutional, legal and budgetary capacities. The related term "readiness" describes the ability to quickly and appropriately respond when required.

*A **preparedness plan** establishes arrangements in advance to enable timely, effective and appropriate responses to specific potential hazardous events or emerging disaster situations that might threaten society or the environment.*

Prevention

Activities and measures to avoid existing and new disaster risks.

Annotations: Prevention (i.e. disaster prevention) expresses the concept and intention to completely avoid potential adverse impacts of hazardous events. While certain disaster risks cannot be eliminated, prevention aims at reducing vulnerability and exposure in such contexts where as a result the risk of disaster is removed. Examples include dams or embankments that eliminate flood risks, land-use regulations that do not permit any settlement in high risk zones, seismic engineering designs that ensure the survival and function of a critical building in any likely earthquake, and immunisation against vaccine-preventable diseases. Prevention measures can also be taken in or after a hazardous event or disaster to prevent secondary hazards or their consequences such as measures to prevent contamination of water.

Reconstruction

The medium and longer-term rebuilding and sustainable restoration of resilient critical infrastructures, services, housing, facilities and livelihoods required for full functioning of a community or a society affected by a disaster, aligning with the principles of sustainable development and Build Back Better, to avoid or reduce future disaster risk.

Recovery

The restoring or improving of livelihoods, health, as well as economic, physical, social, cultural and environmental assets, systems and activities, of a disaster-affected community or society, aligning with the principles of sustainable development and Build Back Better, to avoid or reduce future disaster risk.

Rehabilitation

The restoration of basic services and facilities for the functioning of a community or a society affected by a disaster.

<p>Residual risk</p> <p>The disaster risk that remains in unmanaged form, even when effective disaster risk reduction measures are in place, and for which emergency response and recovery capacities must be maintained.</p> <p><i>Annotation: The presence of residual risk implies a continuing need to develop and support effective capacities for emergency services, preparedness, response and recovery together with socio-economic policies such as safety nets and risk transfer mechanisms, as part of a holistic approach.</i></p>
<p>Resilience</p> <p>The ability of a system, community or society exposed to hazards to resist, absorb, accommodate, adapt to, transform and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions through risk management.</p>
<p>Response</p> <p>Actions taken directly before, during or immediately after a disaster in order to save lives, reduce health impacts, ensure public safety and meet the basic subsistence needs of the people affected.</p> <p><i>Annotation: Disaster response is predominantly focused on immediate and short-term needs and is sometimes called disaster relief. Effective, efficient and timely response relies on disaster risk-informed preparedness measures, including the development of the response capacities of individuals, communities, organizations, countries and the international community.</i></p> <p><i>The institutional elements of response often include provision of emergency services and public assistance by public and private sectors and community sectors, as well as community and volunteer participation. Emergency services are a critical set of specialised agencies that have specific responsibilities in serving and protecting people and property in emergency and disaster situations. They include civil protection authorities, police and fire services among many others. The division between the response stage and the subsequent recovery stage is not clear-cut. Some response actions, such as the supply of temporary housing and water supplies, may extend well into the recovery stage.</i></p>
<p>Retrofitting</p> <p>Reinforcement or upgrading of existing structures to become more resistant and resilient to the damaging effects of hazards.</p> <p><i>Annotation: Retrofitting requires consideration of the design and function of the structure, the stresses that the structure may be subject to from particular hazards or hazard scenarios, and the practicality and costs of different retrofitting options. Examples of retrofitting include adding bracing to stiffen walls, reinforcing pillars, adding steel ties between walls and roofs, installing shutters on windows, and improving the protection of important facilities and equipment.</i></p>
<p>Risk transfer</p> <p>The process of formally or informally shifting the financial consequences of particular risks from one party to another whereby a household, community, enterprise or state authority will obtain resources from the other party after a disaster occurs, in exchange for ongoing or compensatory social or financial</p>

benefits provided to that other party.

Annotation: Insurance is a well-known form of risk transfer, where coverage of a risk is obtained from an insurer in exchange for ongoing premiums paid to the insurer. Risk transfer can occur informally within family and community networks where there are reciprocal expectations of mutual aid by means of gifts or credit, as well as formally where governments, insurers, multi-lateral banks and other large risk-bearing entities establish mechanisms to help cope with losses in major events. Such mechanisms include insurance and re-insurance contracts, catastrophe bonds, contingent credit facilities and reserve funds, where the costs are covered by premiums, investor contributions, interest rates and past savings, respectively.

Structural and non-structural measures

Structural measures are any physical construction to reduce or avoid possible impacts of hazards, or application of engineering techniques or technology to achieve hazard resistance and resilience in structures or systems. Non-structural measures are measures not involving physical construction, which use knowledge, practice or agreement to reduce disaster risks and impacts, in particular through policies and laws, public awareness raising, training and education.

Annotation: Common structural measures for disaster risk reduction include dams, flood levies, ocean wave barriers, earthquake-resistant construction, and evacuation shelters. Common non-structural measures include building codes, land use planning laws and their enforcement, research and assessment, information resources, and public awareness programmes. Note that in civil and structural engineering, the term "structural" is used in a more restricted sense to mean just the load-bearing structure, with other parts such as wall cladding and interior fittings being termed non-structural.

Underlying disaster risk drivers

Processes or conditions, often development-related, that influence the level of disaster risk by increasing levels of exposure and vulnerability or reducing capacity.

Annotations: Underlying disaster risk drivers – also referred to as underlying disaster risk factors – include poverty and inequality, climate change and variability, unplanned and rapid urbanization, lack of disaster risk considerations in land management and environmental and natural resource management, as well as compounding factors such as demographic change, non-disaster risk-informed policies, lack of regulation and incentives for private disaster risk reduction investment, complex supply chains, limited availability of technology, unsustainable uses of natural resources, declining ecosystems, pandemics and epidemics.

Vulnerability

The conditions determined by physical, social, economic and environmental factors or processes, which increase the susceptibility of an individual, a community, assets or systems to the impacts of hazards.

Annotation: For positive factors which increase the ability of people to cope with hazards see also the definitions of Capacity and Coping Capacity.

Annex

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Draft final report of the Open-ended intergovernmental expert working group on indicators and terminology relating to disaster risk reduction (unedited English version)

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