Results of the informal consultations of the Chair on indicators for global targets A, B, C, D, E, F and G of the Sendai Framework for Disaster Risk Reduction

12 November 2016

United Nations Office for Disaster Risk Reduction (UNISDR)

Consolidated list of possible indicators for global targets A, B, C, D, E, F and G of the Sendai Framework for Disaster Risk Reduction 2015-2030

This document presents recommendations and summarises the technical issues identified by the United Nations Office for Disaster Risk Reduction (UNISDR) (hereafter referred to as the Secretariat) with respect to indicators to measure progress in achieving Global Targets A – E and G of the Sendai Framework for Disaster Risk Reduction (hereafter referred to as the SFDRR).

The indicators recommended for retention are based on the Working Text on Indicators[1], the Technical Collection of Concept Notes on Indicators for the Seven Global Targets of the SFDRR of 10 June 2016, the deliberations in the informal consultations of the Chair on June 20-21 and October 10-11, 2016. The non-paper also takes account of the findings of the feasibility exercise led by the Government of Japan with sixteen Member States between July and September 2016[2].

The technical rationale for the recommendations of the Secretariat is contained in the Concept Notes, and employs a categorisation approach broadly analogous to that adopted by the Inter-agency and Expert Group on Sustainable Development Goal Indicators (IAEG-SDGs).

Compound Indicator	Indicators to measure the achievement of the Global Target which can be constructed on the basis of a number of specific Global Indicators
Global indicators	Indicators ready to contribute to the global measurement of the target, for which a methodology exists, or has been proposed, and for which data is already available in a significant number of countries or can be easily generated through national self-assessment
National Indicators	Indicators, for which a methodology exists or has been proposed, but for which data is not currently easily available in a significant number of countries. These indicators can be applied nationally in countries where the necessary data is available. When data becomes widely available in a larger number of countries, these indicators can potentially migrate to the Global Indicators category.

On the basis of these considerations the Secretariat suggests a set of Compound, Global and National indicators for consideration by the Open-ended Intergovernmental Expert Working Group on Indicators and Terminology Relating to Disaster Risk Reduction (hereafter referred to as the OIEWG) and which are considered feasible for measuring progress towards the Global Targets of the SFDRR. Indicators proposed in the Working Text on Indicators but for which a methodology has not yet been developed nor is data easily available are not included in the present summary.

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[1] based on negotiations during the Second Session of the Open-ended Inter-Governmental Expert Working Group on Indicators and Terminology relating to Disaster Risk Reduction held in Geneva, Switzerland from 10-11 February 2016. Issued on 3 March 2016. Reissued with factual corrections on 24 March 2016

[2] The results of a feasibility exercise conducted among Member States on the indicators for the global targets of the Sendai Framework- Inputs to the second informal consultations of the Chair of the Open-ended Intergovernmental Expert Working Group on Terminology and Indicators relating to Disaster Risk Reduction (OIEWG). Government of Japan, issued on 10-11 October 2016

This document also presents the outcomes of the 10+10 consultations on indicators for Target F which are proposed as the basis for further discussion by Members and experts in the Third Session of the OIEWG.

The outcomes draw on the deliberations of Members and experts in the Second Session of the OIEWG – which were informed by the Concept Note on Indicators for Target F[3] – as well as those held during the intersessional period between February and November 2016, which were informed by technical documentation produced on request by the Secretariat, including the Technical non-paper on indicators for Target F[4].

The outcomes of the 10+10 consultations and the technical recommendations of the Secretariat, are informed by the deliberations of the Inter-agency and Expert Group on Sustainable Development Goal Indicators (IAEG-SDGs) on issues related to international cooperation and the means of implementation. As above, a categorisation approach that is analogous to that used by the IAEG-SDGs, is likewise employed.

Global indicators	Indicators ready to contribute to the global measurement of the target, for which a methodology exists, or has been proposed, and for which data is already available in a significant number of countries or can be easily generated through national self-assessment

Global indicators	Indicators, ready to contribute to the global measurement of the target, for which:
	  a) a methodology exists or has been proposed to address a component of the indicator, and for which data are already available or can be developed, in a significant number of countries,
	  and
	  b) a comprehensive methodology and data are expected to be available within the timeframe for reporting against this target.

Global indicators	Indicators, not currently ready to contribute to the global measurement of the target, but for which a methodology and data can be expected to be developed in a significant number of countries, within the timeframe for reporting against this target.

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[3] Concept Note on Indicators for Global Target F of the Sendai Framework for Disaster Risk Reduction (UNISDR, 10 December 2015)
[4] Technical non-paper on indicators for Target F (UNISDR, 7 November, 2016)

	Target A
A-1	Number of deaths and missing persons due to hazardous events per 100,000 population.
A-2	Number of deaths due to hazardous events.
A-3	Number of missing persons due to hazardous events.

	Target B
B-1	Degree of direct affectedness by hazardous events per 100,000 population.
B-2 or B-2. alt	Number of injured or ill people due to hazardous events Number of people suffering from physical injuries, trauma or cases of disease requiring medical assistance as a direct result of a hazardous events.
B-3a	Number of evacuated people following hazardous events
B-3b	Number of relocated people following hazardous events.
B-4	Number of people whose houses were damaged due to hazardous events.
B-5	Number of people whose houses were destroyed due to hazardous events.
B-6	Number of people who received aid including food and non-food aid due to hazardous events.
B-7	Number of people whose livelihoods were disrupted, destroyed or lost due to hazardous events.

	Target C
C-1	Direct economic loss due to hazardous events in relation to global gross domestic product.
C-2	Direct agricultural loss due to hazardous events.
C-3	Direct economic loss due to industrial facilities damaged or destroyed by hazardous events
C-4	Direct economic loss due to commercial facilities damaged or destroyed by hazardous events.
C-5	Direct economic loss due to houses damaged by hazardous events
C-5b	Damage and loss of administrative buildings.
C-6	Direct economic loss due to houses destroyed by hazardous events
C-7	Direct economic loss due to damage to critical infrastructure caused by hazardous events.
C-8	Direct economic loss due to cultural heritage damaged or destroyed by hazardous events.
C-9	Direct economic loss due to environment degraded by hazardous events.
C-10	Total insured direct losses due to hazardous events

	Target D
D-1	Damage to critical infrastructure due to hazardous events.
D-2	Number of health facilities destroyed or damaged by hazardous events.
D-3	Number of educational facilities destroyed or damaged by hazardous events.
D-4	Number of transportation units and infrastructures destroyed or damaged by hazardous events.
D-4b	Kilometres of road destroyed or damaged per hazardous event.
D-4c	Number of bridges destroyed/damaged by hazardous event.
D-4d	Kilometres of railway destroyed / damaged by hazardous event.
D-4k	Number of airports destroyed / damaged by hazardous event
D-4l	Number of ports destroyed / damaged by hazardous event
D-1 bis	Number of electricity plants / transmission lines destroyed or damaged by hazardous events.
D-5	Number of times basic services have been disrupted due to hazardous events: education (D-5a linked to D-2); water (D-5b linked to D-10)); health (D-5c linked to D-3); sewerage (D-5d); transport (D-5e linked to D-4); government services (D-5f); energy (D -5g); emergency services (D5-h); communications / ICT (D-5i); solid waste (D5-j).
D-14	Number of water and sanitation infrastructures destroyed or damaged by hazardous events

	Target E
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

	Target F
	Category (a) Financial resources.
	Headline indicator for Target F – F-6alt. *Two formulations.* *The 10+10 suggests that a single indicator is selected considering the following 2 options.* *It is expected that methodology and data will be further developed over time for ODA and ultimately OOF.*
	Option 1
F-6 alt	Total official international support (ODA plus other official flows) for national DRR actions that is part of **government expenditure**.
	Option 2
F-6 alt	Total official international support (ODA plus other official flows) for national DRR actions that is part of a **government-coordinated spending plan.**
	Supplementary indicators.
F-6a	Total amount of national DRR expenditure.
F-6b	Total official international support (ODA plus other official flows) for national DRR actions provided by multilateral institutions.
F-6c	Total official international support (ODA plus other official flows) for national DRR actions provided by bilateral entities.

Category (b) Technology development and transfer	
Two formulations. *The 10+10 suggests that a single indicator is selected considering the following 2 options.* *It is expected that methodology and data will be developed over time for ODA and ultimately OOF.*	
Option 1	
F-6d	Total official international support (ODA plus other official flows) for international and regional exchange of science, knowledge, technology and innovation (STI) in DRR.
Option 2	
F-9	**[Number of countries with international and regional initiatives for the exchange of science, technology and innovation in disaster risk reduction.]**
Category (c) Capacity building	
Two formulations. *The 10+10 suggests that a single indicator is selected considering the following 2 options.* *It is expected that methodology and data will be developed over time for ODA and ultimately OOF.*	
Option 1	
F-6e	Total official international support (ODA plus other official flows) to strengthen disaster-related statistical capacities.
Option 2	
F-13	[**Financial and other resources made available to strengthen the statistical capacity of developing countries in collection, analysis, management and use of disaster risk information.**]
Some members of the 10+10 also suggested consideration of F-12, F-12alt. as an option.	
Option 1	
F-12	Number of countries engaging in a voluntary **review of progress in the implementation of national DRR strategies**.
Option 2	
F-12 alt.	Number of countries engaging in a voluntary**, self-initiated, nationally determined peer review of progress in reducing disaster risk reduction.**
This indicator is suggested as an analytical function comparing the relevant data from F-6alt and aggregated loss data from Targets C and D.	
F-15	**Annual percentage of cooperation financing for DRR** ~~provided by developed countries and received by developing countries~~ **compared with the economic losses registered in developing countries.**

	Target G
G-1	Number of countries that have multi-hazard early warning systems.
G-2	Number of countries that have a multi-hazard monitoring and forecasting system.
G-3	Number of people who have access to early warning information per 100,000 population.
G-4	Percentage of local governments having a contingency or emergency plan to act on early warnings.
G-6	Percentage of local governments that have multi-hazard risk assessment / risk information, with results in an accessible, understandable and usable format for the people.
G-5	Number of countries that have multi-hazard national risk assessment / information, with results in an accessible, understandable and usable format for the people.
G-7	Number of people protected per 100,000 population through pre-emptive evacuation following early warnings.

Summary of Concept Notes on Indicators for Global Targets of the Sendai Framework for Disaster Risk Reduction 2015-2030

1. Purpose

The purpose of this document is to support the deliberations of Member States in the selection and design of indicators to monitor progress and achievement of the Global Targets of the SFDRR, and summarises the recommendations of the Secretariat, as well as key technical suggestions and considerations. The document responds to the request for guidance on methodologies and technical feasibility by Members of the OIEWG in its Second Session in Geneva on the 10 and 11 February 2016.

2. Background

This non-paper is based on the *Technical Collection of Concept Notes on Indicators for the Seven Global Targets of the Sendai Framework for Disaster Risk Reduction* (10 June 2016) and on the indicators proposed by Member States and described in the *Working Text on Indicators*[5].

Unless stated otherwise key terms used in this non-paper are those defined in the document *Terminology for Disaster Risk Reduction: Technical working draft for the Chair* (September 2016), which was informed by the *Working Text on Terminology*[6] or are the *working definitions* identified in the Technical Collection of Concept Notes on Indicators for the Seven Global Targets of the SFDRR of the 10 June 2016,

The OIEWG requested the Secretariat to propose methodologies and provide technical inputs at the First and Second Sessions, held in Geneva on 29-30 September 2015 and 10-11 February 2016.

This non-paper builds on, and should be read in concert with the previous technical submissions made by the Secretariat[7]. These include:

- *Concept note on Methodology to Estimate Direct Economic Losses from Hazardous Events to Measure the Achievement of Target C*
- *Concept Note on Methodology to Estimate progress of National and Local DRR Strategy to Measure the Achievement of Target E*
- *Information Note on Comments received on the Working Background Text on Indicators for the Seven Global Targets of the Sendai Framework for Disaster Risk Reduction*
- *Background Paper - Indicators to Monitor Global Targets of the Sendai Framework for Disaster Risk Reduction 2015-2030: A Technical Review*

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[5] Working Text on Indicators based on negotiations during the Second Session of the OIEWG held in Geneva, Switzerland from 10-11 February 2016. Issued on 3 March 2016. Reissued with factual corrections on 24 March 2016.

[6] Working Text on Terminology based on negotiations during the Second Session of the OIEWG held in Geneva, Switzerland from 10-11 February 2016, issued on 3 March 2016, reissued with factual corrections on 24 March 2016.

[7] http://www.preventionweb.net/drr-framework/open-ended-working-group/technical-papers

The recommendations for indicators contained in this document employ a categorisation approach first introduced in the Technical Collection of Concept Notes on Indicators[8] and further refined in the present document and which are broadly analogous to the approach employed by the IAEG-SDGs to analyse the proposed indicators by a) the level of methodological development, and b) overall data availability.

Compound Indicator	Indicators to measure the achievement of the Global Target which can be constructed on the basis of a number of specific Global Indicators
Global indicators	Indicators ready to contribute to the global measurement of the target, for which a methodology exists, or has been proposed, and for which data is already available in a significant number of countries or can be generated through national self-assessment
National Indicators	Indicators, for which a methodology exists or has been proposed, but for which data is not currently easily available in a significant number of countries. These indicators can be applied nationally in countries where the necessary data is available. When data becomes widely in a larger number of countries, these indicators can potentially migrate to the Global Indicators category.

The indicators recommended by the Secretariat are based on the Working Text on Indicators[9], the Technical Collection of Concept Notes on Indicators for the Seven Global Targets of the Sendai Framework for Disaster Risk Reduction of 10 June 2016, the deliberations in the informal consultations of the Chair on 20-21 June, 2016 and October 10-11, 2016. The non-paper also takes account of the findings of the feasibility exercise led by the Government of Japan with sixteen Member States between July and September 2016[10].

This document is informed by, and in turn informs, the deliberations of the IAEG-SDGs, and the UN Statistical Commission (UNSC) on the global monitoring framework for the 2030 Agenda for Sustainable Development.

3. Common Issues

3.1   Temporal Dimension:

For Targets A through D, it is necessary to clearly and unambiguously define the periods of time during which disaster loss and damage data is recorded and reported. This is because, following the impact of a hazardous event, initial estimates of loss and damage tend to change as more and better data and assessments become available. At the same time, it is critical to define during which period losses (for example deaths or missing persons) can be reasonably attributed to the disaster. This issue is particularly critical in the case of slow-onset disasters, such as drought.

In general, estimates of disaster loss and damage after hazardous events tend to stabilise after a period of time, typically between 30 and 90 days after the last report of loss and damage[11]. In

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[8] Technical Collection of Concept Notes on Indicators for the Seven Global Targets of the Sendai Framework for Disaster Risk Reduction (UNISDR, 10 June 2016)

9 based on negotiations during the Second Session of the Open-ended Inter-Governmental Expert Working Group on Indicators and Terminology relating to Disaster Risk Reduction held in Geneva, Switzerland from 10-11 February 2016. Issued on 3 March 2016. Reissued with factual corrections on 24 March 2016

[10] The results of a feasibility exercise conducted among Member States on the indicators for the global targets of the Sendai Framework- Inputs to the second informal consultations of the Chair of the Open-ended Intergovernmental Expert Working Group on Terminology and Indicators relating to Disaster Risk Reduction (OIEWG). Government of Japan, issued on 10-11 October 2016

[11] While earthquakes only last a few minutes, storms may last for several days, floods for several months and droughts

general, this period would be sufficient to allow authorities to establish stable and appropriately representative figures[12].

While it is possible to establish a global standard for the time period after a hazardous event during which loss and damage is attributed to the disaster[13], ultimately any period established would be arbitrary faced with hazardous events and countries of widely different characteristics. It is recommended, therefore, that Member States establish a time period appropriate to their own administrative and legal systems for collecting and attributing disaster loss and damage data and that the duration of this period is explicitly described in the metadata accompanying national disaster loss and damage data.

In the case of multi-annual slow-onset disasters, associated with hazardous events such as droughts that may span more than one year, it is recommended that losses are reported annually.

3.2   Disaggregation:

Both the OIEWG and the IAEG-SDGs are deliberating on disaggregation of data by agreed criteria. Paragraph 26 of the Report of the IAEG-SDGs[14] of the 19 February 2016, recommends:

*'an overarching principle of data disaggregation to accompany the list of indicators, as follows: Sustainable Development Goal indicators should be disaggregated, where relevant, by **income, sex, age, race, ethnicity, migratory status, disability and geographic location,** or other characteristics, in accordance with the Fundamental Principles of Official Statistics'.*

To address this issue, the IAEG-SDGs has established a dedicated Working Group on Data Disaggregation. At the 4th Meeting of the IAEG-SDGs in Geneva from 15 to 18 November 2016 Member States will discuss the Work Plan on Data Disaggregation and examine strategies and best practices for increasing the levels of disaggregation for SDG indicators.

In the case of disaster loss and damage data, data disaggregation is still very incipient. There are few cases for example of systematic collection of data disaggregated by sex and age. Furthermore, although Target 11.5 of SDG 11 emphasises the "*focus on protecting the poor and people in vulnerable situations*", there is little evidence of loss and damage data disaggregated by income or likewise by ethnicity, migratory status or disability.

Unlike the case of the SDGs, the Targets of the SFDRR do not define specific requirements for disaggregation. However, in Paragraphs 19(d) and (g) the Framework does recognise the importance of factors such as gender and disability. At the same time, many indicators chosen to measure progress against the SFDRR Global targets will also be used to measure progress against Targets 1.5, 11.5, 11.b and 13.1 of the SDG.

Taking this into account the Secretariat recommends the following criteria for disaggregation of disaster loss and damage data:

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for several years. In addition, earthquakes may be followed by numerous aftershocks over several weeks. The beginning of the hazardous event would be considered to be the date of the first report of loss and damage. The end of the hazardous event would be considered to be the date of the last report of loss and damage.

[12] www.desinventar.net

[13] For example, medical research in maternal mortality at birth (see http://www.maternalmortalitydata.org/Definitions.html) has led to the establishment of a time period of 42 days following birth for the attribution of maternal mortality.

[14] E/CN.3/2016/2/Rev.1*

- In the case of Targets A to D disaggregated data should be collected nationally by Member States for reporting of all future disaster loss and damage. Given the difficulties of *retrofitting* past disaster loss and damage data for the period 2005-2015, it will not be possible to use disaggregated data for the purpose of measuring the achievement of the Global Targets of the SFDRR.

- The criteria to disaggregate information should be developed by Member States in a manner such that a compromise is found between the commitment to ensure that "no one is left behind"[15], and the burden of cost, feasibility, or sustainability that such additional reporting requirements may entail. The Secretariat recommends that an overarching principle of data disaggregation should be adopted to collect data associated with simple but relevant and collectively exhaustive groups.

- Given the commonality of indicators between the SFDRR and the SDGs, the OIEWG may wish to develop recommendations to countries to guide the disaggregation of loss and damage data that may contribute to, and be informed by the recommendations of the Working Group on Data Disaggregation of the IAEG-SDG.

The following general criteria of disaggregation can be applied across the following Targets of the SFDRR:

	Sendai Framework Targets
Country	A, B, C, D, E, G
Geographic location[16]	A, B, C, D,
Hazard type[17]	A, B, C, D, G

The following additional criteria of disaggregation could be applied to Targets A and B, taking into account criteria of disaggregation that are being discussed in the context of the IAEG-SDGs:

Income:
The IAEG-SDGs is discussing disaggregation by characteristics including: social protection for work; international poverty line; people who receive unemployment benefits; coverage of social protection and labour programmes; households ranked in quintiles of the welfare distribution; prevalence of under-nourishment; debt service as the proportion of exports of goods and services; growth rates of household expenditure or income per capita among the bottom 40% of the population and the total population; net ODA to least developed countries.

For the SFDRR global indicators, the Secretariat recommends the use of the **international poverty line**[18]**.**

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[15] Resolution 70/1, para. 48

[16] by sub-national administrative unit, similar or equivalent to municipality. This is referred to as geographic location in the discussions of the IAEG-SDGs.

[17] for example using the IRDR classification, hazards can be disaggregated by specific hazard type, and by family or group, e.g. climatological, hydrological, meteorological, geophysical, biological and extra-terrestrial

[18] In October 2015, the World Bank updated the international poverty line to US$1.90 a day (using 2011 prices).

Sex:
The IAEG-SDGs is discussing disaggregation by characteristics including: pregnant; married under-age; having experienced female genital mutilation; proportion of women in managerial positions; proportion of countries with guaranteed equal rights to land ownership for women; persons owning a mobile phone; unemployment rate; employed women covered by maternity benefits; convenient access to transport; and proportion of young women and men (below the age of 18 years) having experienced sexual violence.

For the SFDRR global indicators the Secretariat recommends disaggregation by **women / men.**

Age:
With respect to Age, no common international standard exists. As identified by UN DESA[19], and as evidenced by the variety of existing national and international practices, many different age classifications are in use; for instance group size (number of years - grouped together), group boundaries (ages defining a group) and age range (lowest and highest age). In considering existing national and international practices, DESA identified common elements[20] including the widespread use of five- and ten-year age groups, with the boundaries generally beginning at multiples of five and ten and ending at four and nine.

The IAEG-SDGs is discussing disaggregation by characteristics including: neonatal; infant; child; adolescent; youth; adults; older persons.

For the SFDRR global indicators the Secretariat recommends disaggregation by **children, adults and older people[21].**

Race, Ethnicity and Migratory Status:
The Secretariat suggests that these categories, which are being discussed in the context of the IAEG-SDGs, may wish to be considered by Member States for national reporting but are inappropriate for global application.

Disability:
The IAEG-SDGs is discussing disaggregation by characteristics including those identified in the UN Convention on the Rights of Persons with Disabilities, for instance: long-term physical, mental, intellectual or sensory impairments which, in interaction with various attitudinal and environmental barriers, hinders their full and effective participation in society on an equal basis with others.

Given the wide spectrum of disabilities, coupled with the practical implications for data collection and reporting, the Secretariat suggests that only one classification of disability be used that would encompass all aspects of disability.

For the SFDRR global indicators the Secretariat therefore proposes the category: **People with disabilities**.

Additional recommendations for disaggregation that are specific to individual Targets are contained in respective sections of the non-paper.

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[19] PROVISIONAL GUIDELINES ON STANDARD INTERNATIONAL AGE CLASSIFICATIONS. Department of International Economic and Social Affairs - Statistical Office - STATISTICAL PAPERS Series M No.74. (ST/ESA/STAT/SEA.M/74)
[20] idem
[21] Children – 0 to 14 years; Adults – 15 to 64 years; Older People – 65+ years.

3.3 Data standards, availability and normalisation:

With respect to Targets A to D, there is currently no global standard for disaster loss data. However, a number of initiatives are currently working on developing standards, for example under the auspices of the EC Joint Research Centre (JRC) and Integrated Research on Disaster Reduction (IRDR) Data Group[22].

In the absence of an agreed international standard, the Secretariat recommends the adoption of a set of minimum standards for disaster loss and damage data that would contribute to the data quality and global comparability required to be able to measure progress against the Global Targets.

These proposed minimum standards are:

1. All loss indicators defined by the OIEWG decision as a minimum requirement should be recorded and reported.
2. National disaster loss data collection should have no data entry threshold (only the existence of damages).
3. Disaster loss data should be reported at the minimum scale of national level (but further disaggregation is encouraged).
4. Disaster loss data should be recorded and reported by each Hazardous event[23].
5. Disaster loss data should be recorded and reported with hazard(s) that triggered the event.
6. Disaster loss data should specify the temporal span (start and end dates) of each event.
7. UNISDR (including IRDR) Hazard definitions should be followed[24].
8. Human related losses (mortality and affected in Targets A and B) should be recorded and reported using disaggregation defined by the OIEWG.
9. When possible data should also be disaggregated by other characteristics as relevant.
10. Disaster loss data ideally should be recorded on a scale of specific geographic unit, ideally units similar to a municipality.

These minimum standards are expected to be further developed over time in close coordination with national and regional statistics bodies, given that disaster loss and damage data will have to comply with standards for official statistics currently being discussed in the context of the IAEG-SDGs.

89 countries currently use the open-source, open-access DesInventar methodology and software to manage their data on disaster loss and damage[25]. However, provided that data complies to the minimum standards described above, and is consistent with the scope of the SFDRR that includes disasters of all scales, countries may use the information or database system or software most appropriate to their own context to manage their disaster loss and damage data.

At the present time, not all countries systematically collect disaster loss and damage data and

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[22] See IRDR, 2014. Peril Classification and Hazard Glossary. Beijing, China: IRDR
See JRC Science and Policy Reports 2015. Guidance for Recording and Sharing Disaster Damage and Loss Data. Ispra, Italy: JRC
[23] Hazardous event: The occurrence of a natural or human-induced phenomenon in a particular place during a particular period of time due to the existence of a hazard.(Proposed updated Terminology on Disaster Risk Reduction, August 2015)
[24] Note: OIEWG to examine proposed man-made hazards and definitions
[25] www.desinventar.net

even fewer integrate this data into official national statistics.   Given that the measurement of the SFDRR Global Targets requires a comparison of average losses between 2020-2030 with 2005-2015, many countries will have to undertake archival work to recover records of disaster loss and damage since 2005 and then begin the systematic recording of all new loss. Other countries with existing national disaster loss databases will also have to undertake archival work to: a) recover data for those indicators agreed by the OIEWG but which are not represented in databases at present, and b) strengthen the collection of future data in a way that reflects the need for disaggregation and the development of new indicators.

In order to assess progress against the SFDRR Global Targets, the disaster loss and damage data reported by Member States will have to be normalised to reduce the influence of extreme high-severity, long-return period disasters on the global data.

Target A: updated concept note on methodology

1. Overview:

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*

This Concept Note, developed by the Secretariat at the request of Member State, is based on previous experience of governments, academic and research institutions, private organizations and work of the United Nations in more than 89 countries supporting the reporting and management of disaster loss data.

The methodology outlined in the Concept Note proposes the collection and use of **simple and uniform physical indicators of mortality (number of people)** as the point of departure for computation.

2. Context:

While disaster mortality has been assessed and reported in different disaster data initiatives using slightly different approaches, the degree of coherence and consistency of the end results is high. As such variations in approach result in relatively minor inconsistencies in global disaster mortality data.

Analysis carried out for the UN Global Assessment Report on Disaster Risk Reduction (GAR) 2015[26] showed that both global and national datasets provide very similar numbers on mortality, and that most variation was usually a function of differences in the reporting thresholds of some databases. Another source of variation derives from the fact that some disaster loss databases do not take into account missing persons, and only count certified deaths.

3. Recommended Indicators:

No.	Indicator	Methodology	Data
A-1	Number of deaths and missing persons due to hazardous events per 100,000.	Y	Y
A-2	Number of deaths due to hazardous events.	Y	Y
A-3	Number of missing persons due to hazardous events.	Y	Y

Summary of Computing Methodology:

Indicator A-1 is a compound indicator, calculated as the simple sum of Indicators A-2 and A-3.

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[26] See Global Assessment Report 2015. Annex 2. Loss Data and Extensive Risk Analysis. Geneva, Switzerland: UNISDR

4. Applicable Working Definitions:

Target A of the SFDRR specifically requires "global disaster mortality" to be estimated.

Working Definition:

Deaths: The number of people who died during the disaster, or directly after, as a direct result of the hazardous event

Missing: The number of people whose whereabouts is unknown since the hazardous event. It includes people who are presumed dead, for whom there is no physical evidence such as a body, and for which an official/legal report has been filed with competent authorities.

Note from the Secretariat: The data on number of deaths and number of missing are mutually exclusive. In the definition of "Missing" the Secretariat suggests that the data is contingent upon the existence of legal reports or declarations. Such reports or declarations will ultimately result in those persons being legally declared dead ("declared death in absentia" or legal presumption of death) despite the absence of direct proof of the person's death, such as the identification of physical remains (e.g. a corpse or skeleton) attributable to that person. As a result, the indicator would use only official data, and not be dependent upon unofficial sources – such as mainstream media or humanitarian situation reports.

5. Critical issues, sources, data collection and statistical processing:

Source and data collection

The Secretariat recommends that reporting against these indicators uses official national data on disaster loss and damage.

Data on "Missing" is not consistently collected in all countries, or is mixed with data on deaths. This, therefore, may require additional work to report against indicator A-3.

Statistical processing

Disaster mortality is significantly influenced by extreme high-severity, long-return period disasters, which in given years may represent a significant proportion of total global disaster mortality (as was the case in the disasters associated with the Haiti earthquake in 2010 or the Indian Ocean Tsunami in 2004). As highlighted in 3.3 above, provided that all data is reported by hazardous event, normalisation techniques will permit the influence of extreme losses to be identified and controlled.

Target B: updated concept note on methodology

1. Overview:

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*

This Concept Note, developed by the Secretariat at the request of Member State, is based on previous experience of governments, academic and research institutions, private organizations and work of the United Nations in more than 89 countries supporting the reporting and management of disaster loss data.

The methodology outlined in the Concept Note proposes the collection and use of **simple and uniform physical indicators of affected (number of people)** as the point of departure for computation.

2. Context:

The attributes of *affected* are numerous and complex. People can be affected in many ways and to different degrees: from the loss or destruction of their primary residence, to the inconvenience of being unable to use household appliances as a result of an interruption in the electricity supply. People can be affected at great distance from the location of the hazardous event and long after the event occurred. As such, even while *affected people* is an attribute that can be found in many disaster loss databases, without an explicit definition of what it includes, it is too imprecise to enable measurement

The document *Terminology for Disaster Risk Reduction: Technical working draft for the Chair* (September 2016) states:

People […] 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.

Given the large number of variables involved, difficulties in measurement and lack of data it is not feasible to measure the number of indirectly affected people globally with any degree of accuracy. As such the Secretariat proposes a set of specific indicators that would estimate the degree of **direct affectedness** and that for the purposes of measuring the Global Target would be taken as a proxy for the number of affected.

This indicator, while not perfect, uses widely available data and could be used consistently across countries and over time to measure the achievement of the Target B. The use of data on *affected people* from existing disaster loss databases is not recommended for the reasons expressed above.

3. Recommended Indicators:

The Secretariat suggests a set of global indicators for consideration by the OIEWG and which are considered feasible for measuring progress towards the Global Targets of the Sendai Framework for Disaster Risk Reduction, as well as indicators for national application in those countries where the necessary data is available. When a significant number of countries are able to report data on those indicators they can migrate to the category of global indicators and be used to measure progress towards the Global Targets.

No.	Indicator	Methodology	Data
B-1	Degree of direct affectedness by hazardous events per 100,000.	Y	Y
B-2 or B-2. alt	Number of injured or ill people due to hazardous events Number of people suffering from physical injuries, trauma or cases of disease requiring medical assistance as a direct result of a hazardous events.	Y	Y
B-3a	Number of evacuated people due to hazardous events	Y	N
B-3b	Number of relocated people due to hazardous events	Y	N
B-4	Number of people whose houses were damaged due to hazardous events.	Y	Y
B-5	Number of people whose houses were destroyed due to hazardous events.	Y	Y
B-6	Number of people who received aid including food and non-food aid due to hazardous events.	Y	N
B-7	Number of people whose livelihoods were disrupted, destroyed or lost due to hazardous events.	Y	Y

Summary of Computing Methodology:

From the perspective of data availability, feasibility of collection and measurability, and informed by the discussions in the informal sessions, the Secretariat has proposed the use of a compound indicator **B-1** based on the sum of **B-2, B-4, B-5 and B-7**.

B-2 would be directly collected for each hazardous event. **B-4** and **B-5** would be calculated multiplying the number of houses damaged or destroyed by the national average of persons per household in the country. Data on the number of houses damaged or destroyed is already collected under **Target C.**

B-7 would be calculated using the number of people associated with the asset affected. For agricultural crops and livestock lost it would be the average number of workers per hectare or livestock in the country. The inclusion of data on the average number of people that work in industries and commercial facilities would be dependent on the further development of indicators **C-3** and **C-4** as global indicators under Target C. On the contrary, **B-7** would only reflect loss of agricultural livelihoods.

4. Applicable Working Definitions and Terminology:

Terminology:

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.

Working Definition:

Evacuated: The number of people who temporarily moved from where they were (including their places of residence, work places, schools, and hospitals) to safer locations in order to ensure their safety.

Houses damaged: Houses (housing units) with minor damage, not structural or architectural, which may continue to be habitable, although they may require some repair or cleaning.

Houses destroyed: Houses (housing units) levelled, buried, collapsed, washed away or damaged to the extent that they are no longer habitable.

Injured or ill: The number of people suffering from physical injuries, trauma or cases of disease requiring immediate medical assistance as a direct result of a hazardous event.

Livelihood: Means, capabilities, tangible and intangible assets, including human, social, natural, physical, financial resources, that people draw upon to make a living.

People who received food relief aid: The number of persons who received food /nutrition, by government or as humanitarian aid, during or in the aftermath of a hazardous event.

People whose houses were damaged or destroyed due to hazardous events: The estimated number of inhabitants previously living in the houses (housing units) damaged or destroyed. All the inhabitants of these houses (housing units) are assumed to be affected being in their dwelling or by direct consequence of the destruction/damage to their housings (housing units). An average number of inhabitants per house (housing unit) in the country can be used to estimate the value.

Productive assets*: Assets with both direct and indirect values, which can be used to generate a value-added

Relocated: The number of people who moved permanently from their homes to new sites due to a hazardous event.

5. Critical issues, sources, data collection and statistical processing:

Source and data collection

The Secretariat recommends that reporting against these indicators uses official national data on disaster loss and damage.

Data on indicators **B-4, B-5** and **B-7** would be collected under Target C. Therefore data on global indicator **B-2** would be the only data to be collected specifically for Target B.

Statistical processing:

The number of affected people is significantly influenced by extreme high-severity, long-return period disasters, though to a lesser degree than disaster mortality. As highlighted in 3.3 above, provided that all data is reported by hazardous event, normalisation techniques will permit the influence of extreme losses to be identified and controlled for.

Exclusion of Mortality:

The Secretariat recommends that mortality figures are not counted in this category.

Double-counting:

Double counting of affected people is unavoidable. People may be injured, have their house damaged and have lost their livelihood, for example.   The use of **direct affectedness** as a proxy value implicitly recognises that double counting will exist.   However, provided that data is collected consistently the proxy should be sufficiently robust to enable the measurement of the achievement of Global Target B.

Target C: updated concept note on methodology

1. Overview:

Target C: *Reduce direct disaster economic loss in relation to global gross domestic product (GDP) by 2030*

This Concept Note is based on work to estimate direct disaster economic loss published in the UN Global Assessment Report on Disaster Risk Reduction (GAR)[27]. This in turn is based on a simplified and adapted version of the UN Economic Commission for Latin America and the Caribbean methodology for disaster assessment (UN-ECLAC, 2014) developed with a number of scientific and private sector partners. The methodology has been tested with datasets from 82 countries, found in the GAR15, using 350,000 reports of small, medium and large scale disasters.

2. Context:

Detailed assessments of economic loss are regularly carried out by governments and multilateral organisations following large-scale disasters, using methodologies derived from the above-mentioned ECLAC methodology[28]. However, the economic losses associated with small and medium scale disasters are rarely assessed or even documented. At the same time, in the attribute *economic loss* in many disaster loss databases, it is often difficult to determine which methodology, criteria and parameters have been used for estimation, and thus which elements of economic loss have been considered.

Given that the scope of the SFDRR includes all scale of disaster, the Secretariat recommends a methodology that assigns a **consistent**, **conservative** and **homogeneously** estimated economic value to all reported **physical losses**, be they in small, medium or large scale disasters**.**

This methodology proposes, whenever possible, the collection and use of **simple and uniform physical indicators of damage (counts of assets affected)** from official disaster loss and damage data as the starting point for calculations, instead of requesting countries to directly evaluate the economic value of direct losses.

The economic evaluation methodology is presented for each of the indicators proposed. Each section contains a brief explanation of the three steps (data collection, conversion of physical value into economic value, and conversion from national currency into US dollars) while identifying challenges and suggesting options for countries to consider how to address them.

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[27] See Global Assessment Report 2015. Annex 2. Loss Data and Extensive Risk Analysis. Geneva, Switzerland: UNISDR
See Global Assessment Report 2013. Annex 2. Loss Data and Extensive Risk Analysis. Geneva, Switzerland: UNISDR
[28] https://www.gfdrr.org/damage-loss-and-needs-assessment-tools-and-methodology

3. Recommended Indicators:

The Secretariat suggests a set of global indicators for consideration by the OIEWG and which are considered feasible for measuring progress towards the Global Targets of the Sendai Framework for Disaster Risk Reduction, as well as indicators for national application in those countries where the necessary data is available. When a significant number of countries are able to report data on those indicators (in particular on commercial and industrial facilities, and losses of environmental assets or cultural heritage) they can migrate to the category of global indicators and be used to measure progress towards the Global Targets.

No.	Indicator	Methodology	Data
C-1	Direct economic loss due to hazardous events in relation to global gross domestic product.	Y	Y
C-2	Direct agricultural loss due to hazardous events.	Y	Y
C-3	Direct economic loss due to industrial facilities damaged or destroyed by hazardous events	Y	N
C-4	Direct economic loss due to commercial facilities damaged or destroyed by hazardous events.	Y	N
C-5	Direct economic loss due to houses damaged by hazardous events	Y	Y
C-5b	Damage and loss of administrative buildings.	Y	N
C-6	Direct economic loss due to houses destroyed by hazardous events	Y	Y
C-7	Direct economic loss due to damage to critical infrastructure caused by hazardous events.	Y	Y
C-8	Direct economic loss due to cultural heritage damaged or destroyed by hazardous events.	Y	N
C-9	Direct economic loss due to environment degraded by hazardous events.	Y	N
C-10	Total insured direct losses due to hazardous events	Y	N

Summary of Computing Methodology:

Indictor **C-1** is a compound indicator, calculated using Indicators **C-2, C-5, C-6** and **C-7**. The methodology is described in the Concept Note.

As a first step, countries collect information on the number of physical assets (for example, houses, or hectares of agriculture) damaged or destroyed. The use of physical damage indicators makes the assessment of direct losses more transparent and verifiable, and will allow the incremental improvement of assessment as improved methodologies are developed, and better and more comprehensive baseline data (for example on commercial or industrial facilities or on environmental assets) are collected by countries.

As a second step, using a simple and consistent pricing methodology for indicators of losses in respect of houses, agriculture, roads, schools, and health facilities, it is possible to estimate a significant part of total direct economic loss. Suggestions are also made as to economic valuations of industrial, commercial, cultural heritage and environmental loss and damage.

With respect to the built environment a simple methodology is proposed estimating the price of

lost assets, using the cost of construction as the basis for replacement value.

The Economic Commission for Latin America and the Caribbean (ECLAC) methodology suggests that the value of the **physical damage to buildings (applicable to indicators C-3 to C-7)** can be calculated as replacement value based on the:

- size of the building
- price per square meter of construction
- damage to furniture and equipment contained in the building (as % of the value of building)
- associated infrastructure (utility networks access roads, landscaping, as % of the value of building).

The percentage replacement values of **equipment and associated infrastructure** varies between sectors. In the case of houses, for example, the equipment contained is suggested in ECLAC and other methodologies to be 25% of the replacement value of the house. This percentage is much higher in health and industrial sectors.

In the case of damaged structures, where damage varies from very light to heavy damage, the **average** cost of damages is calculated as a percentage of the total replacement value of the asset. ECLAC uses 25% as the average damage ratio.

For **transportation infrastructures (C-7)**, the methodology uses rehabilitation costs per lineal meter of roads, extracted from common projects in the sector. Average rehabilitation costs can be extracted from statistics of a relevant number of rehabilitation projects in ministries of public works or using international datasets such as the ROKS database of the World Bank.

Agricultural damage loss (indicator C-2): Losses in crops are estimated by calculations based on the output value of the number of hectares of crops (**C-2a**). The underlying principle is that direct losses (seeds, fertilizers, pesticides, labor and other direct costs that comprise what farmers invest in their crops) can be estimated as a percentage of the expected yield of crops, valued using the price to producer of the yield per hectare. In the case of livestock, the direct cost of loss of animals is assessed as the price to producer of the total number of animals lost (**C-2b**) calculated using the price per kilo of meat of livestock. Prices to producer and other agricultural statistics such as crop areas are commonly calculated and maintained by national ministries of agriculture, or can be extracted from international datasets such as those kept by FAO.

Cultural Heritage economic losses are much more difficult to assess, therefore for the purpose of assigning **a direct economic loss value**, a simple division of assets lost in two groups is proposed:
- one composed of buildings, monuments and fixed infrastructure, and
- the second composed of 'mobile' elements such as art, historical artefacts.

The economic assessment of direct losses associated with the items will come from rehabilitation costs, and in the case of totally lost mobile assets, from its market value.

In all cases, the Secretariat is proposing, as best practice, that **all of the physical damage indicators are collected and kept by countries as these are important information assets**.

Environmental losses (C-9) are proposed to be evaluated using a minimal number of indicators of physical damage recording damage data for up to 11 biomes considered by the TEEB methodology, recommending as minimum requirement the **losses associated to Forests**. For each biome, the Secretariat **initially proposes the use of "Raw Materials" service** as a proxy for direct economic losses, the most relevant of the 22 ecosystem services associated with these biomes in terms of loss of assets thus direct economic loss. The rest of these services are considered part of indirect losses.

Insured direct losses (C-10) may be measured with information provided by the insurance and reinsurance industry or by national insurance regulators. In principle, the indicator does not contribute directly to the target given that it would capture trends in insurance coverage rather than the reduction of direct disaster economic losses. At the same time, it also poses issues related to moral hazard, in that increased insurance penetration could lead to a reduced imperative to invest in risk reduction. However, collecting this information could serve a dual purpose:

> (a) Provide evidence-based information about the total direct economic losses, in countries with a high or very high level of insurance penetration (direct insured losses would represent a high proportion of total direct economic losses).

> (b) Provide useful contextual information to a government regarding its level of liability for disaster economic loss (given that governments often are forced to cover through different kinds of assistance those losses that are not insured).

4. Applicable Working Definitions and Terminology:

<u>**Terminology:**</u>

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 physical damage.
Indirect economic loss: a decline in economic value added as a consequence of direct economic loss and/or human and environmental impacts.

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.

Direct economic loss usually happens during the event or within the first few hours after the event and is often assessed soon after the event to estimate recovery cost and claim insurance payments. These are tangible and relatively easy to measure.

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.

Working Definition:

Replacement cost: The cost of replacing damaged assets with materials of like kind and quality. *Annotations: This includes both private and public assets. Replacement is not necessarily an exact duplicate of the subject but serves the same purpose or function as the original (not taking into account building back better.*

5. Critical issues, sources, data collection and statistical processing:

Source and data collection
The Secretariat recommends that reporting against these indicators uses official national data on disaster loss and damage.

The following table summarizes the recommendations of the Secretariat for **data to be collected and reported for measuring the global target** as well as for those national indicators that could potentially migrate to the global level:

No.	Indicator	Methodology	Data
C-2	Direct agricultural loss due to hazardous events. **Data to be collected [Minimum Requirement]:** **C-2a** Number of Hectares of Crops affected **C-2b** Number of Livestock lost **Recommended disaggregation:** **C-2a**: By type of crop **C-2b**: by type of livestock lost	Y	Y
C-3	Direct economic loss due to industrial facilities damaged or destroyed by hazardous events **Data to be collected [Minimum Requirement]:** **C-3a:** Number of industrial facilities damaged or destroyed **Recommended disaggregation:** - By type level of affectation (damaged/destroyed) - By size of Facility (small/medium/large)	Y	N
C-4	Direct economic loss due to commercial facilities damaged or destroyed by hazardous events. **Data to be collected [Minimum Requirement]:** **C-4a:** Number of commercial facilities damaged or destroyed **Recommended disaggregation:** - By type level of affectation (damaged/destroyed) - By size of Facility (small/medium/large)	Y	N
C-5	Direct economic loss due to houses damaged by hazardous events	Y	Y

	Data to be collected [Minimum Requirement]: C-5a Number of houses damaged by hazardous events		
C-6	Direct economic loss due to houses destroyed by hazardous events **Data to be collected [Minimum Requirement]:** C-6a Number of houses destroyed by hazardous events	Y	Y

C-5b	Damage and loss on administrative buildings.
	
	Data to be collected [Minimum Requirement]:
	C-5ba Number of administrative buildings affected by hazardous events
	
	Recommended disaggregation:
	   - By type level of affectation (damaged/destroyed)
	   - By size of Facility (small/medium/large)
		Y	N

C-7	Direct economic loss due to damage to critical infrastructure caused by hazardous events. **Data to be collected [Minimum Requirement]:** **D-2** Number of health facilities destroyed or damaged by hazardous events **D-3** Number of educational facilities destroyed or damaged by hazardous events **D-4b** Number of kilometres of road destroyed or damaged per hazardous event. **D-4c** Number of bridges destroyed/damaged by hazardous event. **D-4d** Kilometers of railway destroyed / damaged by hazardous event. **D-4k** Number of airports destroyed / damaged by hazardous event **D-4l** Number of ports destroyed / damaged by hazardous event **D-1bis** Number of electricity plants / transmission lines destroyed or damaged by hazardous events. **D-14** Number of water and sanitation infrastructures destroyed or damaged by hazardous events **Recommended disaggregation:** - By type level of affectation (damaged/destroyed) - D-2 and D-3: By size of Facility (small/medium/large) - D-4b by type of road (unpaved, single paved, highway)	Y	Y
C-8	Direct economic loss due to cultural heritage damaged or destroyed by hazardous events. **Data to be collected [Minimum Requirement]:** C-8d Number of buildings, monuments and fixed infrastructures of cultural heritage assets C-8e Number of mobile cultural heritage assets (such as artworks) damaged C-8f Number of mobile cultural heritage assets destroyed C-8a Cost of Rehabilitation or Reconstruction of C-8d C-8b Cost of Rehabilitation or Reconstruction of C-8e C-8c Market value of C-8f	Y	N
C-9	Direct economic loss due to environment degraded by hazardous events.	Y	N

	Data to be collected [Minimum Requirement]: C-9b Hectares of Forest affected **Recommended disaggregation:** - By type level of affectation (damaged/destroyed)		
C-10	Total insured direct losses due to hazardous events. **Data to be collected [Minimum Requirement]:** C-10a Total value of insured direct losses (in US dollars) **Recommended disaggregation:** - By insured direct losses to houses damaged or destroyed - By insured direct losses to critical infrastructure damaged or destroyed	Y	N

The Secretariat does not recommend the use of economic loss data from existing national and global disaster loss databases for the reasons expressed in Paragraph 2 above.

Statistical processing:

Direct economic loss is significantly influenced by extreme high-severity, long-return period disasters, though to a lesser degree than disaster mortality. As highlighted in 3.3 above, provided that all data is reported by hazardous event, normalisation techniques will permit the influence of extreme losses to be identified and controlled for.

Target D: updated concept note on methodology

1. Overview:

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*

This Concept Note is based on the work published in the UN Global Assessment Report on Disaster Risk Reduction (GAR)[29], and has been enriched and guided by comments and suggestions raised in the OIEWG. The methodology has been tested with datasets of 82 countries, found in GAR15, using 350,000 reports of small, medium and large-scale disasters.

This methodology proposes the collection and use of a **simple inventory of the number of times in which damage** (expressed as the number of assets damaged) **was recorded to critical infrastructures or the number of times in which the provision of the basic service was affected to a noticeable degree**, including interruptions, partial interruptions and reduced quality of service.

2. Context:

Target D refers to two separate but interconnected situations. The first is the situation in which **critical infrastructure is damaged** (without services necessarily being interrupted or compromised in terms of quality) and the second is when **basic services are interrupted** (which could potentially happen with or without damage).

While the length of time these interruptions last, the number of users that suffer the interruption or the quality of service provided are important considerations, measurement would be complex and it is unlikely that data exists in most countries. In particular, it would be difficult for most countries to construct baseline data for the period 2005-2015.

The proposed Indicators monitor the two elements of Target D: "**damage to critical infrastructures**" and "**disruption of basic services**". Part of the data required would be collected under Targets B and C, thereby reducing the burden of data collection.

Indicators **D-2 to D-4, D-1bis** and **D-14** directly monitor the elements of "**damage to critical infrastructures**" by measuring the **number of times** and the **number of facilities** which provide education, health and transportation services are damaged or destroyed.

Indicator **D-5 and its sub-indicators** directly monitor the elements of "**disruption of basic services**" by counting the number of times the provision of basic services are disrupted, either by interruptions of the services, by damage to the facilities that provide the service, or by a measurable reduction in the quality of the service or the population covered by the service – or combination of all the above.

The methodology recommended in the Concept Note proposes three alternative methodologies

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[29] See Global Assessment Report 2015. Annex 2. Loss Data and Extensive Risk Analysis. Geneva, Switzerland: UNISDR
See Global Assessment Report 2013. Annex 2. Loss Data and Extensive Risk Analysis. Geneva, Switzerland: UNISDR

for the creation of an index that combines these two elements and its indicators, and additionally proposes the index is expressed **relative to the population** of the country in order to reflect the importance of damage to critical infrastructure and basic services in small countries.

3. Recommended Indicators:

No.	Indicator	Methodology	Data
D-1	Damage to critical infrastructure due to hazardous events.	Y	N
D-2	Number of health facilities destroyed or damaged by hazardous events.	Y	Y
D-3	Number of educational facilities destroyed or damaged by hazardous events.	Y	Y
D-4	Number of transportation units and infrastructures destroyed or damaged by hazardous events.	Y	N
D-4b	Kilometres of road destroyed or damaged per hazardous event.	Y	Y
D-4c	Number of bridges destroyed/damaged by hazardous event.	Y	N
D-4d	Kilometres of railway destroyed / damaged by hazardous event.	Y	N
D-4k	Number of airports destroyed / damaged by hazardous event	Y	N
D-4l	Number of ports destroyed / damaged by hazardous event	Y	N
D-1 bis[30]	Number of electricity plants / transmission lines destroyed or damaged by hazardous events.	Y	N
D-5	Number of times basic services have been disrupted due to hazardous events: education (D-5a linked to D-2); water (D-5b linked to D-10)); health (D-5c linked to D-3); sewerage (D-5d); transport (D-5e linked to D-4); government services (D-5f); energy (D -5g); emergency services (D5-h); communications / ICT (D-5i); solid waste (D5-j).	Y	Y[31]
D-14	Number of water and sanitation infrastructures destroyed or damaged by hazardous events	Y	Y

Summary of Computing Methodology:

The methodology proposed by the Secretariat suggests the collection and use of a **simple inventory of situations in which either damage** (expressed as the number of assets damaged) **was recorded to critical infrastructures AND/OR situations in which the provision of the basic service was affected to a noticeable degree**, including interruptions, partial interruptions and reduced coverage or quality of service.

Indicators **D-2 to D-4, D-14** and **D-1bis** monitor the elements of "**damage to critical infrastructures**" by measuring the **number of times** and the **number of facilities** providing education, health, electricity and water or sanitation services are damaged or destroyed. These

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[30] D-1 bis reflects the numbering of the Working Text on Indicators. The Secretariat recommends the retention of the indicator as a component of the compound indicator D-1; in which case D-1 bis should be renumbered in the Working Text.

[31] Data is available for many, but not all, of the services D-5a to D-5j described in Section 5 below.

also indirectly monitor elements of "disruption of basic services" associated to these infrastructures in **D-5**. In the same way, indicators can indirectly monitor disruption of water supply, sewage, and electricity services.

Indicator **D-5 and its sub-indicators** directly monitor the elements of "**disruption of basic services**" of Target D by counting the **number of times** the provision of basic services are disrupted, either by interruptions of the services, by damage to the facilities that provide the service or by a measurable reduction in the quality of the service or the population covered by the service – or combination of all the above.

The Secretariat has examined several options to calculate an **Index of Critical Infrastructure Damage and Service Interruption** and recommends a **consolidated count of sectors / services with interruptions or damages (the number of sectors or services that were damaged or interrupted is counted) / population * 100,000**

4. Applicable Working Definitions and Terminology:

Terminology:

Critical infrastructure: The physical structures, facilities, networks and other assets that are essential to the social and economic functioning of a society or community.

Annotation: Critical infrastructures are elements of the infrastructure that support essential services in a society, and the failure of which would have a significant impact on the society. They include electricity, water and transport systems, air and sea ports, communication systems, health and educational facilities, as well as basic services, including public administration and financial services, centres for fire and police.

Working Definition:

Basic services: Services that are needed for all of society to function [effectively / appropriately].

Annotation: Examples of basic services include water supply, sanitation, health care, education, housing, and food supply. They also include services provided by critical infrastructure such as electricity, telecommunications, transport, finance or waste management that are needed for all of society to function.

For this indicator, disruption, interruption or lower quality of basic services is proposed to be measured for the following public services:

Educational facilities: play schools, kindergartens, primary, secondary or middle schools, technical-vocational schools, colleges, universities, training centres, adult education, military schools and prison schools

Emergency Response: disaster management office, fire management service, police, army and emergency operation centres.

Healthcare facilities: health centres, clinics, local and regional hospitals, outpatient centres and in general facilities used by primary health providers

Information and Communication Technology (ICT) system: plants and telephone networks

(telecommunication network), radio and television stations, post offices and public information offices, internet services, radio telephones and mobile phones

Power/energy system: generation facilities, transmission and distribution system and dispatch centres and other works

Sewerage system: sanitation and sanitary sewage systems and collection and treatment of solid waste.

Solid waste management: collection and treatment of solid waste.

Transport system: road networks, railways (including stations), airports and ports

Water supply: drinking water supply system (water outlets, water treatment plants, aqueducts and canals which carry drinking water, storage tanks.)

5. Critical issues, sources, data collection and statistical processing:

Source and data collection
The Secretariat recommends that reporting against these indicators uses official national data on disaster loss and damage.

Data collection
The Secretariat recommends that countries collect and report data as **physical damage indicators**. The following table summarizes the recommendations of the Secretariat for **data to be collected and reported for measuring the global target**:

No.	Indicator	Methodology	Data

D- 2	Number of health facilities destroyed or damaged by hazardous events.
	
	Data to be collected [Minimum Requirement] linked to C-7:
	D-2a Number of health facilities destroyed or damaged by hazardous events
	
	Recommended disaggregation (for C-7):
	     - By level of affectation (damaged/destroyed)
	     - By size of Facility (small/medium/large)
		Y	Y

D-3	Number of educational facilities destroyed or damaged by hazardous events
	
	Data to be collected [Minimum Requirement] linked to C-7::
	D-3a Number of educational facilities destroyed or damaged by hazardous events
	
	Recommended disaggregation (for C-7):
	     - By level of affectation (damaged/destroyed)
	     - By size of Facility (small/medium/large)
		Y	Y

D-4	Number of transportation units and infrastructures destroyed or damaged by hazardous events
	
	Data to be collected [Minimum Requirement] linked to C-7:
	D-4b Kilometres of road destroyed or damaged per hazardous event.
	D-4c Number of bridges destroyed/damaged by hazardous event.
	D-4d Kilometers of railway destroyed / damaged by hazardous event.
	D-4k Number of airports destroyed / damaged by hazardous event
	D-4l Number of ports destroyed / damaged by hazardous event
	
	Recommended disaggregation (for C-7):
	    - By level of affectation (damaged/destroyed)
	    - D-4b by type of road (unpaved, single paved, highway)
		Y	Y

D-1 bis	Number of electricity plants / transmission lines destroyed or damaged by hazardous events. **Data to be collected [Minimum Requirement] linked to C-7:** **D-1bisa** Number of electricity plants / transmission lines destroyed or damaged by hazardous events. **Recommended disaggregation (for C-7):** - By type level of affectation (damaged/destroyed)	Y	N

D-5	Number of times basic services have been disrupted due to hazardous events.
	
	Data to be collected [Minimum Requirement]:
	D-5a Education services were interrupted. (linked to D-2)
	D-5b Water services were interrupted.
	D-5c Health services were interrupted. (linked to D-3)
	D-5d Sewerage services were interrupted.
	D-5e Transport services were interrupted. (linked to D-4)
	D-5f Government services were interrupted.
	D-5g Energy services were interrupted.
	D-5h Emergency services were interrupted.
	D-5i Communications /ICT services were interrupted.
	D-5j Solid Waste services were interrupted.
	
	Recommended disaggregation:
	None recommended.
	
	Interrupted means one or a combination of the following:
	    - Provision of the service was partially or totally interrupted
	    - Level of quality of the service was degraded
	    - Coverage of the service was reduced
		Y	Y
			
			Y
			Y
			Y
			Y
			Y
			N
			Y
			Y
			Y
			N

D-14	Number of water and sanitation infrastructures destroyed or damaged by hazardous events	Y	N
	Data to be collected [Minimum Requirement] linked to C-7: **D-14a** Number of electricity plants / transmission lines destroyed or damaged by hazardous events. **Recommended disaggregation (for C-7):** - By type level of affectation (damaged/destroyed)		34

Statistical processing:

Most damage to critical infrastructure and interruption of basic services is associated with small and medium scale disasters, with the exception of capital-intensive infrastructure such as ports, airports and power stations. As highlighted in 3.3 above, provided that all data is reported by hazardous event, normalisation techniques will permit the influence of extreme losses to be identified and controlled for.

Target E: updated concept note on methodology

1. Overview:

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

This Concept Note is based on the experiences of countries in implementing the Hyogo Framework for Action 2005-2015 (HFA) and analysis of the reports of more than 140 countries that undertook at least one cycle of self-assessment of progress in implementing the HFA. It is also informed by deliberations of Members of both the OIEWG and the Inter-agency and Expert Group on Sustainable Development Goal Indicators (IAEG-SDGs).

2. Context:

Members of both the OIEWG and the IAEG-SDGs have called for quantitative indicators to measure the level of progress, rather than applying only yes/no as regards the existence of national or local strategies. As a result the Secretariat proposes an approach that would allow improvements in the quality of national and local disaster risk reduction strategies to be monitored over time.

National disaster risk reduction strategies should be based on, and aligned with, the scope, outcome, goal, guiding principles, and priorities for action of the SFDRR.   In particular and drawing from Paragraph 27 of the SFDRR, the Secretariat suggests the following five elements as *core requirements* **for national disaster risk reduction strategies**:

   a. *The existence of legislative or regulatory frameworks to mainstream and integrate disaster risk reduction within and across all sectors, promote policy coherence and compliance, and guide public and private sectors by defining roles and responsibilities.*
   b. *Clear time frames, targets and indicators.*
   c. *Explicit objectives and measures aimed at preventing the creation of risk, reducing existing risk, and strengthening economic, social, health and environmental resilience.*
   d. *Assessments of technical, financial and administrative disaster risk management capacity to identify risks at the local and national levels.*
   e. *Strengthened mechanisms to follow-up, periodically assess and publicly report on progress.*

Compared to national strategies, **local disaster risk reduction strategies** are far more heterogeneous, vary across countries and local administrative units, and change over time. Local governments, again with highly heterogeneous characteristics and capabilities, are normally responsible for their development. In general, **national disaster risk reduction strategies** serve a normative function, providing inter alia guiding principles and an overarching framework for disaster risk reduction. Local strategies, aligned with the national strategy, are generally more specific, reflecting local context and hazard profile, and tend to focus on planning and implementation with clear roles and tasks assigned at local level.

Given these considerations, it is considered that **local disaster risk reduction strategies** should be aligned with their respective **national disaster risk reduction strategies.** For the purposes of global monitoring of Target E, it is therefore proposed to simply count the number of **local disaster risk reduction strategies.**   Assessing their alignment with national strategies would therefore be a

national responsibility using nationally appropriate targets and indicators. Countries may wish to draw from relevant sections of the SFDRR, as well as other guidance[32], when determining indicators appropriate to country context for national level monitoring of their local strategies.

3. Recommended Indicators:

No.	Indicator	Methodology	Data
E-1	Number of countries that adopt and implement national DRR strategies in line with the Sendai Framework for Disaster Risk Reduction 2015-2030	Y	Y
E-2	Percentage of local governments that adopt and implement local DRR strategies in line with national strategies	Y	Y

Summary of Computing Methodology:

For indicator E-1, the Secretariat proposes that the five core requirements are weighted equally by assigning 20% (or 0.2) to each requirement. It is then recommended that progress in each requirement is benchmarked according to the following weighting:

     i.   Comprehensive achievement (full score): 1.0,
     ii.   Substantial achievement, additional progress required: 0.75,
     iii.   Moderate achievement, neither comprehensive nor substantial: 0.50,
     iv.   Limited achievement: 0.25,

Overall progress would then be calculated through the arithmetic average of the benchmarks across each of the five core requirements components.

For indicator E-2, the Secretariat proposes that Member States are to count the number of local governments that adopt and implement local DRR strategies in line with the national strategy and express it as a percentage of the total number of local governments in the country.

4. Applicable Working Definitions and Terminology:

Terminology:

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

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.

Disaster risk reduction strategies and plans: define goals and objectives across different timescales and with concrete targets, indicators and time frames. In line with the SFDRR, these

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[32] For instance: the Ten Essentials (www.unisdr.org/campaign/resilientcities/home/toolkitblkitem/?id=1) or the new Local-Urban Indicators for disaster risk reduction and resilience (www.unisdr.org/campaign/resilientcities/home/toolkitblkitem/?id=18)

should be aimed at preventing the creation of risk, the reduction of existing risk and the strengthening of economic, social, health and environmental resilience.

Working Definition:

Local Government: Form of sub-national public administration – to be determined by countries for the purposes of monitoring Target E and measuring progress in establishing local disaster risk reduction strategies – and which generally acts within delegated powers by legislative or regulatory frameworks of the higher level of government.

5. Critical issues, sources, data collection and statistical processing:

Source and data collection

Data will be collected on the basis of national self-assessment using the Sendai Framework Monitor[33].

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[33] The Sendai Framework Monitor is currently under development.

Target F: outcomes of the 10+10 consultations

1. Overview:

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*

The below summarises the outcomes of the 10+10 consultations on indicators for Target F. These are proposed by the 10+10 as the basis for further discussion by Members and experts in the Third Session of the OIEWG.

The outcomes draw on the deliberations of Members and experts in the Second Session of the OIEWG – which were informed by the Concept Note on Indicators for Target F[34] – as well as those held during the intersessional period between February and November 2016, which were informed by technical documentation produced on request by the Secretariat, including the Technical non-paper on indicators for Target F (7 November, 2016).

All technical recommendations by the Secretariat, as well as the outcomes of the 10+10 consultations, are informed by the deliberations of the Inter-agency and Expert Group on Sustainable Development Goal Indicators (IAEG-SDGs) on issues related to international cooperation and the means of implementation.

2. Context:

The deliberations of the 10+10 were principally organised using the three categories (or clusters) that were used in the Working Text, and which are consistent with the acknowledged principles of global cooperation, the categorization used in the SDGs, and the Sendai Framework: (a) Financial Resources, (b) Technology Development and Transfer, and (c) Capacity Building.

In view of the complexity of national DRR actions, and relatively under-developed mechanisms for measuring international support to such actions, the 10+10 examined indicators that, as accurately as possible, capture values of support, so as to allow an appraisal of changing trends in international cooperation over time to 2030.

3. Outcomes of the 10+10 consultations for consideration by the OIEWG:

The table below represents the outcomes of the meetings of the 10+10 consultations on indicators for Target F that took place in the intersessional period, and which concluded on the 11 November 2016. The outcomes are presented thus by the 10+10, with the view to inform further discussion in the Third Session of the OIEWG.

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[34] Concept Note on Indicators for Global Target F of the Sendai Framework for Disaster Risk Reduction, 10 December 2015 (UNISDR)

No.	Indicator	Methodology	Data

Category (a) Financial Resources

Headline indicator for Target F – F-6alt.
Two formulations.
The 10+10 suggests that a single indicator is selected considering the following 2 options.
It is expected that methodology and data will be further developed over time for ODA, and ultimately OOF.

Option 1

F-6alt	Total official international support (ODA plus other official flows) for national DRR actions that is part of **government expenditure**.	Y (ODA) N (OOF)	Y (ODA) N (OOF)

Option 2

F-6alt	Total official international support (ODA plus other official flows) for national DRR actions that is part of a **government-coordinated spending plan**.	Y (ODA) N (OOF)	Y (ODA) N (OOF)

Supplementary indicators

F-6a	Total amount of national DRR expenditure.	N	N
F-6b	Total official international support (ODA plus other official flows) for national DRR actions provided by multilateral institutions.	Y (ODA) N (OOF)	Y (ODA) N (OOF)
F-6c	Total official international support (ODA plus other official flows) for national DRR actions provided by bilateral entities.	Y (ODA) N (OOF)	Y (ODA) N (OOF)

Category (b) Technology development and transfer

Two formulations.
The 10+10 suggests that a single indicator is selected considering the following 2 options.
It is expected that methodology and data will be developed over time for ODA and ultimately OOF.

Option 1

F-6d	Total official international support (ODA plus other official flows) for international and regional exchange of science, knowledge, technology and innovation (STI) in DRR.	N (ODA) N (OOF)	N (ODA) N (OOF)

Option 2

F-9	**[Number of countries with international and regional initiatives for the exchange of science, technology and innovation in disaster risk reduction.]**	N	N

Category (c) Capacity building			
Two formulations. *The 10+10 suggests that a single indicator is selected considering the following 2 options.* *It is expected that methodology and data will be developed over time for ODA and ultimately OOF.*			
Option 1			
F-6e	Total official international support (ODA plus other official flows) to strengthen disaster-related statistical capacities.	N (ODA) N (OOF)	N (ODA) N (OOF)
Option 2			
F-13	[**Financial and other resources made available to strengthen the statistical capacity of developing countries in collection, analysis, management and use of disaster risk information.**]	N	N
Some members of the 10+10 also suggest consideration of F-12, F-12alt. as an option.			
Option 1			
F-12	Number of countries engaging in a voluntary **review of progress in the implementation of national DRR strategies**.	Y	Y
Option 2			
F-12alt	Number of countries engaging in a voluntary**, self-initiated, nationally determined peer review of progress in reducing disaster risk reduction.**	Y	Y
This indicator is suggested as an analytical function comparing the relevant data from F-6alt and aggregated loss data from Targets C and D.			
F-15	**Annual percentage of cooperation financing for DRR** ~~provided by developed countries and received by developing countries~~ **compared with the economic losses registered in developing countries.**	Y (ODA) N (OOF)	Y (ODA) N (OOF)

Summary of Computing Methodology:

The table above was a product of the 10+10 consultation of the 11 November 2016, which was most recently informed by the Technical non-paper on indicators for Target F[35], in which the Secretariat provided technical considerations of indicators being discussed, and detailed metadata for certain indicators.

While some of the suggested options above can be considered a simple disaggregation of data collected for the headline indicator, Members should take note that the in the event of further re-formulations or new proposals, additional work will be required to understand technical feasibility and subsequently develop the metadata, including computation methodologies.

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[35] produced on 7 November 2016 by the Secretariat at the request of the 10+10

Computation methodologies that are currently available are proposed in the Technical non-paper – for indicators F-6alt (Option 2) and F-12alt. – and are summarised below.

F-6alt.

The methodology captures international cooperation in support of national DRR actions by recording total official international support (ODA and other official flows) – flows can be reported by providers, in the short term using ODA data, and/or by recipients, using data from national accounts. When added to total government expenditure on national DRR actions (from domestic resources), the total value of official resources in support of national DRR actions can be calculated.

If this data is disaggregated at the national level, an estimation of the proportion of the total official resources available for national DRR actions, that is made up of official international support, can be calculated – providing an estimate of the degree of reliance of the country on external support and how this is changing over time.

F-12alt.

Summation of the reports of Sendai Framework Peer Reviews, and/or data contained in the national self-assessment progress reports of the Sendai Framework Monitor.

4. Applicable Working Definitions and Terminology:

Applicable working definitions are available for those of the suggested options above that are addressed in the Technical non-paper. Additional work will be required to provide working definitions for new formulations and new proposals. The following working definitions are taken from the Technical non-paper on indicators for Target F, and do not necessarily reflect the views of the 10+10 consultations.

<u>**Working Definitions:**</u>

Official development assistance (ODA): ODA is defined as flows of official financing (essentially grants or concessional loans) administered with the promotion of the economic development and welfare of developing countries as the main objective, and which are concessional in character with a grant element of at least 25 per cent (using a fixed 10 per cent rate of discount).

In addition to financial flows, technical co-operation is included in aid. Grants, loans and credits for military purposes are excluded. Transfer payments to private individuals (e.g. pensions or insurance payouts) are in general not counted. By convention, ODA flows comprise contributions of donor government agencies, at all levels, to developing countries ("bilateral ODA") and to multilateral institutions. ODA receipts comprise disbursements by bilateral donors and multilateral institutions. Lending by export credit agencies — sole purpose of export promotion — is excluded (OECD source IMF 2003).

Government coordinated spending plan: is defined as a financing plan / budget for national DRR actions, clearly assessing the available sources of finance and strategies for financing future needs.

International cooperation: principally concerns aid (some of it quantifiable) in the form of grants or loans by external support agencies. Thus in the context of this indicator, and until such time as more inclusive methodologies capturing the totality of flows are developed, the amount of ODA related to support for national DRR actions can be used as a proxy for this.

Developing countries: A clear universally agreed concept of developing country is yet to be agreed. Analysis by the World Bank identified that the term is used in a number of different ways depending on the purpose[36]. Current practice is largely a mix of the (adapted) M49 statistical classification and the definition inherent in ODA. To facilitate the monitoring of the SDGs, work will be undertaken under the auspices of the IAEG, to develop a coherent approach to regional groupings.

It is recommended that until such time as this is finalised, that the DAC list of ODA Recipients (developing countries) be used for this indicator. This list includes developing countries and territories eligible for receiving ODA; consists of all low and middle income countries based on gross national income (GNI) per capita as published by the World Bank, with the exception of G8 members, EU members, and countries with a firm date for entry into the EU. The list also includes all of the Least Developed Countries (LDCs).

Self-initiated, nationally determined peer review: an on-demand, self-determined exercise of appraisal and exchange to promote mutual learning and sharing of information and good practices through voluntary and self-initiated peer reviews among interested States.

5. Critical issues, sources, data collection and statistical processing:

Critical issues

These are presented in detail in the technical documentation provided by the Secretariat in advance of the Second Session of the OIEWG, and during the intersessional period from February to November 2016; the latter includes the Technical non-paper on indicators for Target F.

The Concept Note and the Technical non-paper in particular discuss the challenges of accurately capturing progress in achieving the Target, highlighting: the complexities of methodology and the lack of available data, including with regard to the three categories of global cooperation; statistical processing and establishing baselines; capturing quantitative and qualitative aspects; and ensuring national policy leadership and alignment of international cooperation with national priorities.

The Technical non-paper notes that as the definition of total official support for sustainable development evolves, it is anticipated that data generation and capture will improve. It is therefore expected that indicators selected to measure Target F will also evolve over time, enabling a more complete measurement of trends in international cooperation in support of national DRR actions.

Source and data collection

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[36] *analytical* – e.g. the UN Statistical Division M49: 179 countries in 'developing regions'; *political* – e.g. UN G77 with 134 members; *resource monitoring and allocation* – e.g. OECD DAC list of ODA Recipients with 142 potential aid recipients.

Information on sources and data collection are available for those of the suggested options above that are addressed in the Technical non-paper. Additional work will be required to information for new formulations and new proposals.

F-6alt.

Provider: Net official development assistance (ODA) to all countries on the OECD Development Assistance Committee (DAC) List of ODA Recipients pertaining to disaster risk reduction[37], using the subsectors as explained in the list of Creditor Reporting System (CRS) purpose codes.

If adopted by the OECD WP-STAT, the proposed DRR policy marker will provide details of DRR investment for a wider range of sectors in ODA. As measurement frameworks able to capture data that are more representative of the totality of international flows and providers become operational – for example TOSSD, the Technology Facilitation Mechanism, the Technology Bank for LDCs[38] – then the indicator may evolve over time so as to exploit these new data sources.

Recipient: Total government expenditure on national DRR actions (from domestic resources) as part of a government coordinated spending plan, as recorded in national accounts.

If adopted by the OECD WP-STAT, the proposed DRR policy marker methodology can provide greater sectoral specificity to government expenditure on national DRR actions in a wider range of sectors.

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[37] Data are compiled by the OECD DAC from returns submitted by its member countries and other aid providers
[38] See Annex I. of the Concept Note for Target F

Target G: updated concept note on methodology

1. Overview:

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*

This Concept Note is based on previous experience of a number of governments, academic and research institutions, private organizations and work of the United Nations. It is informed, inter alia, by the deliverables of the International Conferences on Early Warning (EWCI 1998, EWCII 2003 and EWC III 2006)[39], analysis derived from the HFA Monitor as well as by inputs from the World Meteorological Organization (WMO) and the National Meteorological and Hydrological Services (NMHSs) of its Members. The note also draws from the GAR (UNISDR, 2009a, 2011, 2013 and 2015), including experience gained in developing and employing a probabilistic global risk model.

The methodology outlined in the Concept Note proposes the use of simple and realistic indicators to measure progress, and aims to produce an indicator that provides a verifiable, consistent and homogeneously estimated measure of the effectiveness of Multi-Hazard Early Warning Systems (MHEWS) as well as of the coverage of risk information and assessments. Consistent with the deliberations of the OIEWG, the Secretariat recommends that Members examine **quantitative indicators to measure quality**; thereby measuring the level of progress.

2. Context:

Given the complexity and wide variation between countries in the different elements and conditions that give rise to effective MHEWS and accessible risk information and assessment, the suggestions made by the Secretariat in the Concept Note can be summarized as follows:

Multi-Hazard Early Warning Systems (MHEWS):

The Secretariat suggests that the outcome of the Third International Conference on Early Warning 2006 (EWC III) be used as the basis for the development of indicators. EWCIII identified **four indispensable components** of effective EWS as the basis for proposed global indicators, all of which need to be coordinated across many agencies at national to local levels:

1. risk knowledge based on the systematic collection of data and risk assessment;
2. detection, monitoring, analysis and forecasting of the hazards and possible consequences;
3. dissemination and communication of authoritative, timely, accurate understandable and actionable warnings and associated information on likelihood and impact;
4. preparedness and local capabilities to respond to the warnings received.

The fourth component is particularly critical, as it contributes directly to Global Targets A, B, C and D. An early warning system without this component would not significantly contribute to the other Global Targets and may actually magnify the disaster. In contrast, effective capabilities and

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[39] http://www.unisdr.org/2006/ppew/info-resources/ewc3_website/
   http://www.unisdr.org/2006/ppew/info-resources/ewc2/

contingency plans at the local level have been found in numerous contexts to be the factor that makes the greatest difference in reducing the impact of hazardous events. Evidence from the HFA Monitor highlighted that this was the component in which least progress had been made in the period 2005-2015.

As the characteristics of MHEWS differ from country to country, the Concept Note proposes a focus on the degree of achievement rather than simply counting the number of countries with MHEWS that fully meet the four components.

In addition, to measuring the achievement of MHEWS, the Secretariat also recommends an additional indicator discussed in the OIEWG, which refers to the number of people protected through pre-emptive evacuations following early warnings. This could be considered a positive *outcome* indicator of MHEWS. Although people who are evacuated are affected, it is considered that this kind of affectation forms part of a positive narrative of protecting life and avoiding injury, which in turn strengthens resilience.

Disaster risk information and assessments:

The Secretariat similarly suggests that in measuring the quality of national disaster risk assessments, countries assess the extent to which those assessments measure against the following **five important criteria**, as described in Paragraph 24 of the SFDRR:

1. baselines and periodic assessment of disaster risks, vulnerability, capacity, exposure, hazard characteristics and their possible sequential effects, of a social and spatial scale, on ecosystems,
2. periodic update and dissemination of location-based disaster risk information, taking into account different needs, including risk maps to decision makers, the general public and communities at risk,
3. systematic evaluation, recording, sharing and publicly accounting for disaster losses and impacts, in the context of event-specific hazard-exposure and vulnerability information,
4. available and accessible information on non-sensitive hazard-exposure, vulnerability, risk, disaster and disaggregated loss, with real time access to reliable data, space and in situ information enhanced by innovative ICT for measurement, collection, analysis and dissemination,
5. capacity building of government officials at all levels, civil society, communities and volunteers, as well as the private sector, through sharing experiences, good practices, and education.

As in the case of Target E it is not proposed to assess the quality of local disaster risk assessments as this would be more appropriately addressed through national level targets and indicators.

3. Recommended Indicators:

No.	Indicator	Methodology	Data
G-1	Number of countries that have multi-hazard early warning systems.	Y	Y
G-2	Number of countries that have a multi-hazard monitoring and forecasting system.	Y	Y
G-3	Number of people who have access to early warning information per 100,000 population.	Y	Y
G-4	Percentage of local governments having a contingency or emergency plan to act on early warnings.	Y	Y
G-6	Percentage of local governments that have multi-hazard risk assessment / risk information, with results in an accessible, understandable and usable format for the people.	Y	Y
G-5[40]	Number of countries that have multi-hazard national risk assessment / information, with results in an accessible, understandable and usable format for the people.	Y	Y
G-7	Number of people protected per 100,000 population through pre-emptive evacuation following early warnings.	Y	N

Summary of Computing Methodology:

Indicator G-1 is a compound indicator for MHEWS, calculated using equally weighted indicators (25% for each indicator) representing the aforementioned four components of MHEWS, namely arithmetic average of the 4 indicators, G-2 through G-4 and G-6.

It is then recommended that progress in each indicator is benchmarked according to the following weighting:

  i. Comprehensive achievement (full score): 1.0,
  ii. Substantial achievement, additional progress required: 0.75,
  iii. Moderate achievement, neither comprehensive nor substantial: 0.50,
  iv. Limited achievement: 0.25,

For the numeric indicators (G3, G4 and G6) the results would be benchmarked as quartiles. For example, a percentage between 0 and 25% would be benchmarked as *Limited achievement,* a percentage between 26% and 50% as *Moderate achievement etc.*

Overall progress would then be calculated through the arithmetic average of the benchmarks across each of the four components.

It is recommended that in benchmarking indicator G-2 the proportion of hazards in the country covered by monitoring and forecasting system be considered. For example, in a country subject to storms, floods, tsunamis and volcanic eruptions but in which only storm hazard had a detection and forecasting system, the benchmark against indicator G-2 would be of 0.25. If detection and forecasting systems existed for all four hazards, the benchmark would be calculated as 1.0.

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[40] G-5 is a compound indicator only in that it is constructed on the basis of the five important criteria mentioned previously

Indicator G-7 as an outcome indicator would be calculated separately as population protected per 100,000.

It is proposed that **indicator G-5** is calculated using an equal weighting (20%) of each of the important criteria. It is then recommended that progress in each requirement measured using the following benchmarks:

     i.   Comprehensive achievement (full score): 1.0,
     ii.   Substantial achievement, additional progress required: 0.75,
     iii.   Moderate achievement, neither comprehensive nor substantial: 0.50,
     iv.   Limited achievement: 0.25,

Overall progress would then be calculated through the arithmetic average of the benchmarks across each of the five core requirements. As in the case of MHEWS, it is recommended that in benchmarking the indicators, the coverage of hazards in the country be considered.

4. Applicable Working Definitions and Terminology:

Terminology:

Early warning system*:* An   integrated system of hazard monitoring, forecasting, risk assessment, disseminating centralized warnings and information, and preparedness that enables individuals, communities, governments, businesses and others to take timely action to reduce risks in advance of hazardous events.

Multi-hazard early warning systems cover a range of hazards and impacts. They are designed to be used in multi-hazard contexts where hazardous events may occur simultaneously, cascadingly or cumulatively over time, and taking into account the potential interrelated effects. A multi-hazard early warning system increases the efficiency and consistency of warnings for multiple hazards through coordinated and compatible mechanisms and capacities, involving multiple disciplines for updated and accurate hazards identification and monitoring.

Hazard: 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 degradation.

Annotation: Hazards may be natural, anthropogenic or socio-natural in origin. ***Natural hazards*** *are predominantly associated with natural processes and phenomena.* ***Anthropogenic hazards****, or man-made hazards, are induced entirely or predominantly by human activities and choices. 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 hazards is characterised by its location, intensity, frequency and probability.

Hazardous Event*:* The manifestation of a hazard in a particular place during a particular period of time.

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.

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.

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

Risk assessment: A quantitative approach to determine the nature and extent of 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: Risk assessments (and associated risk mapping) include: 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, economic dimensions, [**environmental impact assessment**,] and the evaluation of the effectiveness of prevailing and alternative coping capacities in respect to likely risk scenarios. This series of activities is sometimes known as a risk analysis process.*

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

Working Definition:

Local Government: Form of public administration at the lowest tier of administration charged with the responsibility for disaster risk reduction within a designated territory, which generally acts within delegated powers by legislation or directives of the higher level of government.

5. Critical issues, sources, data collection and statistical processing:

Source and data collection

Data will be collected on the basis of national self-assessment using the Sendai Framework Monitor[41].

Indicator G-3 could be calculated using the coverage of cellular telephone, television or radio services, taking into account the media through which early warnings are distributed in a country.

The calculation of indicators G-4 and G-6 would be analogous to indicator E-2. However, the percentage would be then converted into quartiles (limited achievement through to comprehensive achievement), as indicated in the computing methodology above.

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[41] The Sendai Framework Monitor is currently under development.