Statistics on disaster occurrences and immediate direct impacts

A working paper for discussion by the Expert Group on Disaster Related Statistics

Sendai, March 2015

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1.Introduction

Asia-Pacific is the most disaster-affected region in the world and the improved management of disaster risks is a priority for countries in the region. Disaster risks, particularly those related to extreme weather events, are expected to increase from climate change. Decision makers and disaster response authorities and stakeholders in the country need statistics of high-quality to mitigate risk and to protect the most vulnerable populations, infrastructure and economic activities, and to effectively respond and recover when disasters occur.

Member States of ESCAP established the Expert Group on Disaster-related Statistics through Resolution E/ESCAP/RES/70/2, included in its entirety in the Annex D. This resolution stressed the need to improve the quality of data related to disasters to enable a comprehensive assessment of the socioeconomic effects of disasters and strengthening evidence-based policymaking at all levels for disaster risk reduction and climate change adaptation. The resolution also called for development of an agreed "basic range of disaster-related statistics".

At its first meeting in October, 2014, the Expert Group advised that development of a regional basic range of disaster-related statistics initially focus on: (i) disaster occurrences and (ii) immediate and direct impacts. This working paper is designed to facilitate discussion among the Expert Group members, towards development of technical guideless for the basic range of disaster-related statistics, with a focusses on two initial and fundamental components or themes of the basic range.

The remainder of this section introduces the purpose and scope of this working paper. Section 2 provides a brief summary of the perspective of the demand for disaster-related statistics. Sections 3 and 4 present some initial recommendations for the use of terminologies and concepts for statistics on disaster occurrences and immediate impacts, respectively. Sections 3 and 4 also contain some introductory descriptions of existing statistical guidelines of relevance and other information on good practices. Section 5 contains a discussion on the topic of integration of disaster statistics in national statistical systems and coordination between disaster management agencies with statistics offices, including with some results from studies conducted in five ESCAP member States. This section also addresses the alignment between the recommendations in this working paper with the emerging Post-2015 Disaster Risk Reduction and Sustainable Development Goals frameworks. The final section of the report very briefly cites a few preliminary proposals for future work to expand this working paper towards a regional guideline for disaster-related statistics.

Purpose

This document aims to describe a proposal to facilitate discussion by the Expert Group on Disaster-Related Statistics to develop the basic range of disaster-related statistics and its associated statistical guidelines or best practices. This document focusses on two initial and fundamental components or themes of the basic range, as advised by the Expert Group at its first meeting in October, 2014, which are: statistics on (i) disaster occurrences and (ii) immediate and direct impacts. Ultimately, the objective for this work will be:

- to strengthen the quality of disaster-related statistics to enhance monitoring for improving disaster risk management, informing the overall development processes, and to the extent possible to assist in the monitoring and reporting progress in term of outcome in the implementation of the post-2015 framework for disaster risk reduction[1] and sustainable developments,
- to ensure that there is sufficient reference to guidance and best practices available for countries to establish or improve their approaches to production of disaster-related statistics,
- to provide a consistent basis for national development and international technical assistance, as needed, and
- to promote the use of disaster statistics that are comparable between countries, and if possible, towards eventual establishment of global standards for disaster-related statistics.

Rationale

Asia-Pacific is the most disaster-affected region in the world and the improved management of disaster risks is a priority for member countries. The disaster risks particularly those related to extreme weather events are expected to increase from climate change. Decision makers and disaster response authorities and stakeholders in the country need statistics of high-quality as the basis for developing policies and programme to prevent and mitigate the risk, to protect the most vulnerable populations, infrastructure and economic activities, and to effectively respond and recover when disasters occur.

Member States of ESCAP established the Expert Group through Resolution E/ESCAP/RES/70/2, included in its entirety in the Annex C. This resolution stressed the need to improve the quality of data related to disasters to enable a comprehensive assessment of the socioeconomic effects of disasters and strengthening evidence-based policymaking at all levels for disaster risk reduction and climate change adaptation. It also called for development of an agreed “basic range of disaster-related statistics”.

[1] A proposed monitoring mechanism for the post-2015 Framework for DRR consists of three layers: outcome (disaster losses, disaster impacts), output (disaster risks, underlying drivers of risks and resilience, socioeconomic resilience) and input (risk knowledge, risk governance: reducing existing risks, avoiding new risk, strengthening socio economic resilience) (UNISDR, Issue Brief, 3rd WCDR Working session on Measuring and Reporting Progress, 2015).

Focus

The expected outputs from the Expert Group are reference guidelines for producing the basic range of disaster-related statistics. The first meeting of the Expert Group decided that the initial focus of the development of this basic range of disaster-related statistics and associated statistical guidance material, is on the concepts of disaster occurrences and immediate and direct impacts of disasters, and therefore these two concepts constitute the main focus in this document.

It is expected that the recommendations included in this documents will help facilitate the technical discussions between members of the Expert Group and, ultimately, be utilised for development by the group of a guideline for producing a basic range of disaster-related statistics.

2.Demand for disaster-related statistics

Disaster risk management is a process by which governments and communities undertake measures, investments, or actions that seek to reduce the level of risk. Risk management connotes a comprehensive perspective on disasters, within which multiple phases of policy development and information management can be recognized, such as risk identification and prevention, risk reduction, mitigation and preparedness, disaster response, and medium and long term recovery.

In the ideal circumstances, these different phases for statistics should be able to draw from a common database and sharing common terminologies and common measurement approaches, at least for a basic range of disaster-related statistics, including statistics on disaster occurrences and immediate impacts. A list of terms with appropriate definitions should be developed taking into consideration the ones that are already in existence. Table 1 describes some of the fundamental aspects of these different phases of disaster risk management. Information on disaster occurrences and immediate impacts of disasters are relevant to nearly all disaster risk management issues and phases described in Table 1. Furthermore, coherent statistics and a coherent conceptual understanding to the measurement of disaster occurrences and immediate impacts are a necessary input for analysis of many of the issues and analytical requirement items referenced in the table, such as investment in disaster risk reduction and calculating losses.

- **Recommendation 1:** A list of terms with appropriate definitions related to disaster occurrences and immediate impacts statistics should be agreed by the Expert Group for the development of regional guidelines on a basic range of disaster-related statistics.

Table 1: The different phases of disaster risk management and related statistics requirements[2]

Typical issues in the different phases of disaster risk management	Typical decisions and plans to be made	Sample of statistics requirements
Peace time: Risk identification, • Disaster risks can be estimated but are not known • Development investments should be informed by risk profiles • Risks that development investments may exacerbate existing(and or create new) disaster risks	• Prioritizing investments in risk reduction • How to invest in development while avoiding new risks	• The dynamic hazard profiles (magnitude, temporal and spatial distribution) • Vulnerability and baseline of exposure: (demographic and, socioeconomic statistics) and baseline of exposure in areas prone to natural hazards • Utilizing available data to calculate risk probability profiles • Historical disaster data, forecasted losses • Identifying particularly vulnerable groups
Peace time: risk reduction, mitigation and preparedness • Risk Profiles are changing as new information becomes available and development in potentially vulnerable areas takes place • Early warning systems and other monitoring systems, where available, are continuous delivering information on risks and possibilities for mitigating impacts	• Introduction of new measures to reduce disaster risk • Introduction of mechanisms to improve or ensure sufficient early warning and adequate preparedness • How to invest in development that can address disaster and climate risks and minimized creation of new exposures • Whether and how to discourage development in hazardous areas	• Scale and qualities of investment in disaster risk reduction • Signals of hazards transforming into increased risk of disaster • Level of awareness, preparedness, and investment against disasters • Factors that cause and or exacerbate disaster risks • Baseline information on vulnerable groups, e.g. location of residents living below the poverty line
Response • Imperative is to act quickly and efficiently to save lives and mitigate unnecessary suffering • Sufficient scale of injection of resources to put crisis under control • Urgent demand to meet t overwhelming needs for places where vital systems and delivery of basic resources is affected	• Determine the magnitude of the disaster and prioritization the needs for emergency relief • How to make the response the most efficient • How to manage needs given impacts to local supplies of goods and services (how to address temporary interference to local services supply) • How to mount emergency response while also putting in place requirements for medium and long term recovery	• Disaster occurrence, including temporal, and spatial spread of the event • Disaster type and characteristics of impacts, e.g. rapid or slow onset, concentrated or widespread, etc. • Immediate indication of impacts on population, damage, losses, and disruption of functions / services • Recovery needs which potentially could be increasing • Who is responding what, where and when
Medium and long term recovery • Yet unaddressed humanitarian needs • Risk that fragile communities could regress into a new emergency crisis if recovery needs are not met • Less spotlight on initial response may translate to less resources for recovery • Often a normal development policy-planning cycle resumes with many requirements but, due to disaster, less available resources	• How to prioritize recovery of economic sectors and determination of appropriate scale of re-building effort in affected location • How to determine appropriate level of investment required for complete to recovery from impacts for disasters: • Returning to consideration of future risk identification and mitigation (see above)	• Comprehensive and credible post-disaster accounting for damage, losses, and disruption of functions / services • Magnitude of requirements to address recovery needs • Coping mechanisms of communities, localities and sectors • New post-disaster calculation of vulnerability to future incidents

[2] Establishing Basic Range of Disaster Related Statistics: A Motivation, Background paper to 1st meeting of the Expert Group

3. Defining disaster occurrences for statistical purposes

Development of guidelines for statistical purposes involves balancing the analytical demands for statistics with the practical challenges of data collection and compilation into indicators. This will have to follow the fundamental requirements of statistical quality including relevance, rigor, reliability, and timeliness. It is not the intention in this document, and for development of a regional basic range of disaster related statistics, to suggest changes in definitions for disasters as applied to national laws or by member States in national or international policy dialogues. Rather, the intention is to identify (and, ultimately, to implement at the national level) clear and practical internationally-consistent definitions for statistics purposes, which will strengthen the overall quality of disaster-related statistics for a variety of purposes, including for developing national policies and setting priorities.

Defining disaster occurrences or statistical purposes requires a higher degree of pragmatic specificity as compared to definitions for disasters that might be applied more generally or for other purposes. However, coherence of statistics between sources within countries and between countries requires consistency in definitions and their implied data collection methodologies. Achieving this purpose inevitably requires an inter-agency consensus, both within and across countries, on statistical definitions for what constitutes measurement of a disaster occurrence and its impacts.

The United Nations International Strategy for Disaster Reduction (UNISDR) uses the following as a definition for disasters: “a serious disruption of the functioning of society, causing widespread human, material or environmental losses which exceed the ability of the affected society to cope using only its own resources”[3]. This definition is useful for many purposes; however additional specificity is required for identifying a disaster occurrence statistical purposes, for instance to objectively identify "a serious disruption", “widespread losses”, or "ability to cope".

A methodology for the Basic Range of Disaster-related statistic that is both conceptually consistent with the UNISDR definition but also meeting the specificity requirements of consistent measurement of disaster occurrences is proposed as follows:

To be considered a disaster occurrence, an observed event or incident must simultaneously meet two criteria:

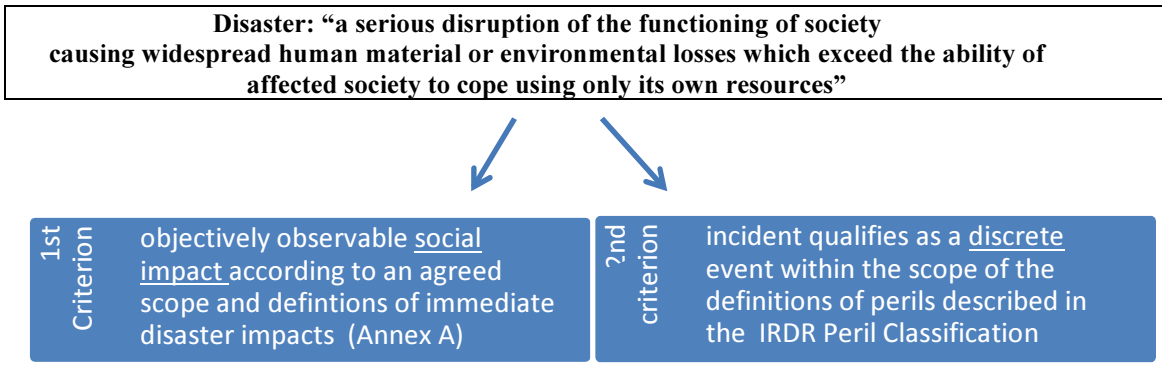
- The first criterion is a threshold of social impact. This is an objectively observable social impact according to an agreed scope and definition of immediate disaster impacts, such as the definitions presented in the table in Annex B[4]. A social impact criterion is already commonly utilized in many national and international databases on disaster losses or damage and the concept is consistent with a distinction used in disaster risk reduction literature between use of the terms disaster occurrence and hazards.
- The second criterion is that the incident must qualify as a discrete event that fits with reference to the IRDR Peril classification presented in the table in Annex-C.

[3] http://www.unisdr.org/eng/terminology/terminology-2009-eng.html

[4] http://www.desinventar.net/effects.html

These proposed criteria for the statistical definition of disaster occurrence are represented graphically below:

Figure 1: Proposed criteria for a statistical definition for disaster occurrence



Social impact criteria presented in the left-hand column of Annex B are organized according to four types of social impacts: those related to people; related to homes; related to infrastructure, and economic losses. Therefore, at last one of these types of immediate impacts must be observed for an incident to meet the social impact criterion.

The IRDR Peril classification, presented in the left-hand column of Annex C,[5] and associated definitions provides the general scope for the 2nd criteria and for how a disaster occurrence is differentiated from other types of incidents or events or crises that otherwise could meet the social impact criterion on some timescale. The issue of scale and the qualification that an occurrence refers to a discrete event is discussed briefly in the sub-section below.

Countries may, for national purposes determine it useful to include additional peril classes, such as technical disasters or other man-made accidents. Further discussion among expert group members is encouraged on other types of hazards or peril relevant to the region or a more detailed listing of types of potential disasters to meet analytical needs on the national scale. However, for the purpose of developing a regional basic range of disaster-related statics, the IRDR Peril classification should be noted as a useful general reference guide for the proposed second criterion. Whereas some components of the classification may be more or less relevant to individual countries, the hierarchical structure of the classification and definitions is useful to ensure that the overall scope for statistics on disaster occurrences is comparable internationally.

- **Recommendation 2:** For statistical purposes, a working definition of disaster occurrence is: "An event or incident that is observed and simultaneously meets a threshold of social impact and qualifies as a discrete event that fits referring to IRDR perils classification".

Adopting this approach has implications for structure and management the results for data collections that are de-centralised. Measurement of disaster occurrences, according to the first criterion, involves relationship between statistics on occurrences and impacts. Each disaster occurrence must be given a unique identifier along with other specification such as time and location. This is important to help relate this data with all of the relevant statistics on disaster impacts, among other relevant items within

[5] http://www.irdrinternational.org/

the basic range of disaster related statistics. The use of a unique identifier, with associated characteristics for a disaster occurrence creates the possibility for relational structure of databases at the national level that could, ultimately, be used to integrate a complete basic range of disaster-related statistics for any given disaster occurrence.

- **Recommendation 3**: Each disaster occurrence should be given a unique identifier for creating relational links to other statistics (e.g. on impacts) along with other identifying characteristics such as time and location of occurrence.

Scale and geography of a discrete disaster occurrence

One of the challenges in identifying disaster occurrences for statistical purposes is the imperative that these statistics include a discrete time and geographic location including spatial scale of impacts.

Some disasters affect multiple administrative (or reporting) areas or even multiple countries. For example, a hydrological event may cause flooding and/or landslides in multiple regions. Although the impacts may be of a different nature or different scale in each of the relevant administrative regions, the scale of impacts may or may not meet the impact criteria for a disaster individually in each of the affected locations. Clear guidelines are needed for national reporting agencies on how to aggregate disaster statistics or identify disasters as one or more discrete events depending on the scale of the analysis or the scope of related databases. Disaster occurrence statistics should not be affected subjectively or arbitrarily by choices of temporal or spatial scale of data compilation.

- **Recommendation 4:** For statistical purposes, disaster occurrence should meet the criterion of a discrete event, which implies a specific and observable discrete location and beginning and end to the occurrence.

Moreover, risks and disaster prone areas are not evenly distributed across countries. Disaster risk-related statistics are not usually produced from nationwide data collection but from data collected from studies of hotspots or affected regions. Given the nature of the analytical demand for disaster-related statistics, geographic information system (GIS) should be viewed as an essential tool

As much as possible, effort should be made to link disaster geographic databases to the geographic spatial units and boundaries that are most analytically relevant to the types of hazards, e.g. to hotspots or river basins for the case of floods or to coastally adjacent regions for the case of ocean-related hazards. While these naturally distinguishable geographic units usually are aligns well to the administrative zonings, in some cases, it may be useful to consider incorporating integration across standard administrative boundaries within the design of national disaster databases.

In terms of temporal scale, the criterion for a discrete event implies a specific and observable beginning and end to the occurrence. Technically, the criterion would exclude from the scope of a basic range of disaster-related statistics slow-onset or on-going crises such as desertification, which is generally defined as a process of gradual degradation to land.

- **Recommendation 5:** Disaster occurrence statistics should be linked to geographic information and, where possible, be supported by applying GIS and related technologies for organizing databases according to the specific analytical needs of disaster management.

4. Immediate direct impacts of disasters

Over the years, quite a number of governments with the assistance of UNDP have progressed in compiling disaster losses databases. These databases enable the exploration of patterns of immediate direct impacts at the national and sub-national level. The Expert Group has not yet specifically identified the need to adapt the definitions proposed as part of UNDP's support for establishing these national databases (see Annex B)[6], or to create new terminologies for measuring immediate direct impacts of disasters. The range of immediate direct impacts derived from Annex B could be adopted internationally for the purpose of a basic range of disaster-related statistics because it encompasses all of the major categories of immediate impacts of disasters, regardless of disaster type or other contextual consideration.

- **Recommendation 6:** Statistics on immediate direct impacts from disasters, as they apply to a basic range of disaster-related statistics, can be derived from the definitions in Annex A.

As noted, ultimately the compilation of statistics on immediate impacts of disasters should be related directly to the identifier for a discrete disaster occurrence, including its relevant locational and temporal characteristics. It is also important to note that databases containing statistics on disaster impacts should maintain coherence with other existing international statistical standards of relevance adopted globally through the United Nations Statistical Commission (UNSC). For example, the System of National Accounts (SNA)[7] records data on catastrophic losses resulting from events that include disaster occurrences where there are losses to economic assets. Valuation of such economic losses is conducted according to the valuation principles established in the SNA for a broad range of purposes, includes calculating aggregates for production (GDP), consumption, saving, and other indicators of national economies.

With regards to the demographic-related immediate direct impacts of disasters, such as the number of persons killed or displaced, one of the important qualities in a basic range of disaster-related statistics is geographic location referencing and, where feasible, the possibility of linking with other relevant social-economic information on the affected population. Guidelines for producing these kinds of disaggregated statistics on population have been developed for other purposes such as in the Principles and Recommendations for Population and Housing Censuses, Rev. 2. A crucial next step for the development of a basic range of disaster-related statistics will be to conduct a comprehensive review of the applicability of such existing international standards and guidelines and statistics for the purposes of improving the quality of disaster-related information.

- **Recommendation 7**: Compilations of statistics on immediate direct impacts of disasters should be consistent with relevant existing international standards and guidelines adopted by the United Nations Statistics Commission.

[6] List of disaster impacts compiled by IRDR, UNDP and available from the DesInventar website (http://www.desinventar.net/effects.html), and impact statistics for the Extreme Events and Disasters component in the Basic Range of Environment Statistics, adopted by the UN Statistics Commission (UNSC) as part of the revised United Nations Framework for the Development of Environment Statistics (FDES 2013).

[7] http://unstats.un.org/unsd/nationalaccount/pubs.asp

Beyond the existing statistical guidelines and standards adopted by the UNSC, another noteworthy reference with respect to measurement of immediate impacts from statistics is the ECLAC Handbook for Disaster Assessment, commonly known as the "DALA Handbook" (ECLAC, 2003, 2014[8]), which provides guidance for collecting information on economic "losses" and "damages" from disasters.

The use of the terms "losses" and "damages" in the Handbook is unique, as compared to common usage of these terms in English. The Glossary in the 2014 update of ECLAC's DALA Handbook defines damages as "the cost of replacing destroyed assets with others that have the same physical and technological characteristics." However, the way that damages are actually measured in practice through the DALA methodology is determined based on an accounting for numbers of damaged or destroyed assets, which can be measured in physical or in monetary units. The valuation of these losses, such as via investigating replacement costs, is a separate statistical exercise; therefore, the DALA handbook explanation of damages is a mixture of measurement of direct damages and valuation of these effects.

"Losses", in the DALA handbook, are "goods that go unproduced and services that could not be provided during a period running from the time the disaster occurs until full recovery and reconstruction is achieved." In other words, in relation to this basic range of disaster statistics, the losses is output foregone during the period from after the moment of the disaster occurrence until recovery. Therefore, losses, as the term is used in DALA, are excluded from the scope of "immediate impacts" of disasters, as prioritized by the Expert Group. This example underscores the importance of adopting an agreed glossary of terminologies for the Expert Group's work on a basic range of disaster-related statistics. Guidance materials developed by the Expert Group will need to clearly and definitively describe this scope for the use of terms and relationships between direct and immediate impacts, as defined for the basic range of disaster statistics, with the the uses of the terms in "losses" and "damages" from other references, such as the DALA Handbook. It is also important that the basic range of disaster-related statistics make a distinction that direct impacts of disasters and the economic valuation of those impacts are separate measurement challenges.

- **Recommendation 8:** In recording immediate direct impact of disaster occurrence, quantifying damages to property or economic assets in volume terms should be distinctly differentiated from the subsequent monetary valuation of these damages.

- **Recommendation 9:** The use of terms related to impacts of disasters should be consistent with an agreed glossary or standard of impact-related terminology.[9]

[8] http://repositorio.cepal.org/bitstream/11362/36823/1/S2013817_en.pdf

[9] An agreed glossary or standard of impact-related terminologies will be developed in order to clarify the means of a few commonly used terms.

5. Integration of disaster statistics with national and international policy frameworks

With agreement on a consistent approach to measurement of disaster occurrences and immediate impacts comes a vast range of analytical possibilities through linking these statistics with the baseline official statistics describing conditions in the economy, society and environment in relevant locations before and after a disaster. Linking these statistics requires coordination with the relevant sources of these baseline statistics and access to statistics at an appropriate spatial and temporal scale. While it is beyond the scope of this paper to describe all the pertinent examples, it is important to review explicitly the linkages between disaster occurrence and immediate impacts statistics for monitoring and reporting of major frameworks including the Post-2015 Framework for Disaster risk Reduction and the broader Sustainable Development Goals (SDGs).

It is anticipated that implementation of regional guidelines for the consistent recording of disaster occurrences and immediate impacts is a necessary first step towards this aim. On the other hand, there is also a need to improve the accessibility and applicability of other official statistics such as geographic disaggregation to improve the analysis of disaster risk reduction themes. These topics should be addressed in greater detail, as relevant within the scope of an agreed basic range of disaster-related statistics in the subsequent work of the Expert Group.

Alignment with Post-2015 Framework for Disaster Risk Reduction

During the Third United Nations World Conference on Disaster Risk Reduction, Member States will, among others, reiterate their call for disaster risk reduction and the building of resilience to disasters to be addressed with a renewed sense of urgency.[10] This is to be undertaken in the context of sustainable development and poverty eradication and, as appropriate, to be integrated into policies, plans, programmes and budgets at all levels and considered within relevant frameworks by adopting a concise, focused, forward-looking and action-oriented post-2015 framework for disaster risk reduction.

The framework will focus on understanding disaster risk and how it is created; strengthen governance and coordination and coherence mechanisms at all levels; invest in economic, social, cultural resilience of people, communities and countries and the environment through technology and research; enhance multi–hazard early warning systems, preparedness, response, recovery and reconstruction at all levels; ensure the full and meaningful participation of women, children and vulnerable groups in the disaster risk reduction decision–making process, and ensure practices are gender responsive; and enhance and strengthen international cooperation with developing countries to complement their national actions.

[10] ADVANCED UNEDITED VERSION (CORR.1)Post-2015 framework for disaster risk reduction, Further Streamlined Text (as negotiated up to 28 January 2015)

The current draft framework contains a statement of outcome, over the next 15 years, to achieve a substantial reduction of disaster risk and losses, to lives, livelihoods and health and to the economic, physical, social, cultural, environmental assets of persons, businesses, communities and countries.

In terms of goal, the framework seeks to prevent new and reduce existing disaster risk through the implementation of integrated and inclusive economic, legal, social, cultural, environmental, political and institutional measures which reduce hazard exposure and vulnerability to disaster, and thus strengthen resilience.

The proposed targets to be negotiated in the framework are listed below:

(i) Substantially reduce disaster mortality [per capita] by 2030 [to achieve a minimum average global mortality from disasters between 2020 and 2030 lower than the average mortality between 2005 and 2015.]

(ii) Substantially reduce the number of affected people per capita at the global level by 2030 to achieve this target at minimum average of number of affected people from disasters between 2020 and 2030 will be lower than the average number of affected people between 2005 and 2015.

(iii) [Reduce direct disaster economic loss in relation to global GDP by 2030.]

(iv) Substantially reduce disaster damage to critical infrastructure, particularly health and educational facilities [by a given percentage] by 2030.

(v) Substantially increase the number of countries with national and local disaster risk reduction strategies by 2020.[Increase by a given percentage accordingly with national capacities the number of national instruments to reduce direct disaster economic loss by 2030.]

(vi) [Substantially] enhance international cooperation in support of disaster risk reduction [[in / to] developing countries / from developed to developing countries], including through providing adequate, [additional and] timely and predictable financial resources, technical assistance, technology transfer, capacity building and training programmes, [in order to enhance resilience to disasters and implement the framework / for the implementation of this framework] [by xx % by 2030].

(vii) Substantially increase the availability of and access to multi-hazard early warning systems and disaster risk information and assessments to the people by 2030.

Implementation of regional guidelines for the consistent recording of disaster occurrences and immediate impacts is envisioned to respond directly to the proposed targets 1 to 4. Countries will find it necessary to monitor and report the outcome of disaster risk reduction in terms of impacts of disaster occurrences on mortality, number of affected people, as well as damage and economic losses.

- **Recommendation 10:** The basic range of disaster-related statistics should, as appropriate and to the extent possible, be aligned with targets of post-2015 framework for disaster risk reduction.

Integration with sustainable development goals

The SDGs, when adopted, are expected to provide a globally recognized framework of public policy priorities, such as ending poverty and ensuring sustainable access to basic resources. Potentially, there are complex relationships between disasters and development goals, with influences in both directions, and analyses of these relationships requires a capacity for linking between databases that is not currently feasible for most national statistical systems.

The Open Working Group on sustainable development goals is currently proposing targets, an excerpt is presented in Annex E,[11] that contain combined aspects of disasters' economic impacts, mortality and livelihood protection instead of single targets. For instance:

> By 2030, build the resilience of the poor and those in vulnerable situations and reduce their exposure and vulnerability to climate-related extreme events and other economic, social and environmental shocks and disasters
>
> 11.5 By 2030, significantly reduce the number of deaths and the number of people affected and decrease by [x] per cent the economic losses relative to gross domestic product caused by disasters, including water-related disasters, with a focus on protecting the poor and people in vulnerable situations

- **Recommendation 11:** the Expert Group should include in its future work plan exploration of specific issues and challenges for linking databases on disaster occurrences and immediate impacts with baseline official statistics in order facilitate integrated analyses of disaster risk reduction that takes advantage of the complete range of available statistics from national statistical systems including those related to SDGs

Coordination between NSOs and NDMAs

There are clear opportunities for sharing of expertise between national statistical offices (NSOs) and National Disaster Management Agencies (NDMAs). A few pertinent examples have already been mentioned, such as, for example, the need to integrate statistics on damages to economic assets with the system of national accounts (SNA). Institutional arrangements for managing databases of disaster-related statistics vary according to the structures of national governments. However, usually, disaster occurrences and direct impact databases are primarily the responsibility of NDMAs and the primary challenge is to link these databases with the broader national statistics systems.

[11] https://sustainabledevelopment.un.org/content/documents/1579SDGs%20Proposal.pdf

During 2013 and 2014, ESCAP and UNDP Asia-Pacific Regional Centre joined together to study current practices for coordination between the national statistical offices (NSOs) and national disaster management agencies (NDMAs) in five countries in Asia and the Pacific: Indonesia, Sri Lanka, Mongolia, Kiribati and the Republic of Korea.[12] The review of these five case studies points to three key conclusions related to effective coordination for improving the quality of disaster-related databases and linking the statistics with other relevant data compilations:

(i) Clear roles and mandates of NSOs and NDMAs in relation to producing information for analysis of disaster risk reduction policy;

(ii) Creating opportunities for systematic cooperation and efficient transferring and storage of data; and

(iii) Recognized standard terminologies and measurement guidelines for disaster-related statistics so that government agencies can more easily share information and improved cross-agency knowledge on database systems and data collection technologies used by NDMAs and NSOs.

- **Recommendation 12:** Guidance and best practices for creating strong coordination and data-sharing arrangements between NDMAs and other agencies in national statistical systems, particularly national statistical offices (NSOs), should be included in the Expert Group's guidelines on the basic range of disaster-related statistics.

6. Topics for Future Work

Since one of the objectives for producing a regional guideline for disaster-related statistics is to help with improvement to the quality of disaster-related statistics available across the region, the Expert Group may wish to consider in its plan to review the following quality criteria for information on disasters and for official statistics more generally. For example, UNDP (2014) introduced the following as quality criteria for national disaster loss and damage databases:

1. Up-to-date:
2. Continuous (over a certain period of time)
3. Credible: a database that uses official data sources where possible
4. Publicly accessible: a database that provides public access to the data (i.e. through a website);
5. Quality assured: a database that uses a quality control and validation procedure (although even if not documented a database might still be quality assured);
6. Applied: a database that has documented applications (research or policy applications for which the data provide evidence).

[12] Synthesis of national assessment case studies, a joint study of ESCAP and UNDP Asia-Pacific Regional Centre, 2014

In addition, it is proposed that the Expert Group also consider the harmonization of use of terms, concepts, and measurement methodologies across institutions within countries and across countries as another criterion for improving utility of disaster-related statistics. It is further suggested that, in conducting its work to develop guidelines, the Expert Group formally recognise the United Nation's Statistics Commission's Fundamental Principles for Official Statistics as appended in Annex-D.

Another important step for the Expert Group, pending agreement on recommendations for statistics on disaster occurrences and immediate impacts, is to re-examine the question of how to prioritise addressing demands for statistics beyond the foundational topics in this working paper. The issues described in Table 1 and in the above sections on the Post-2015 disaster risk reduction and Sustainable Development goals could provide a good starting point. But the demands for monitoring a basic range of disaster-related statistics, and associated statistical guidance materials, requires further elaboration by the expert group, particularly in relation to current policy priorities and statistical demands at the national level.

The Expert Group may also wish to consider developing a Compilation Guide to provide direct assistance to data compilers who are responsible at the national level for implementing the methodology contained in the basic range of disaster – related statistics. Such a Compilation Guide would be directed at all those work for National Statistical Offices, National Disaster Management Agencies, or any other entity that produces, or can potentially produce, information relevant for the compilation of disaster-related statistics. In addition, such a Guide would also contain information that may be of interest to users who would like to understand better the nature of disaster – related data.

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ANNEXES

Annex A: List of Recommendations to the Expert Group

- **Recommendation 1:** A list of terms with appropriate definitions related to disaster occurrences and immediate impacts statistics should be agreed by the Expert Group for the development of regional guidelines on a basic range of disaster-related statistics.
- **Recommendation 2**: For statistical purposes, a working definition of disaster occurrence is: "An event or incident that is observed and simultaneously meets a threshold of social impact and qualifies as a discrete event that fits referring to IRDR perils classification".
- **Recommendation 3**: Each disaster occurrence should be given a unique identifier for creating relational links to other statistics (e.g. on impacts) along with other identifying characteristics such as time and location of occurrence.
- **Recommendation 4**: For statistical purposes, disaster occurrence should meet the criterion of a discrete event, which implies a specific and observable discrete location and beginning and end to the occurrence.
- **Recommendation 5**: Disaster occurrence statistics should be linked to geographic information and, where possible, be supported by applying GIS and related technologies for organizing databases according to the specific analytical needs of disaster management.
- **Recommendation 6**: Statistics on immediate direct impacts from disasters, as they apply to a basic range of disaster-related statistics, can be derived from the definitions in Annex A.
- **Recommendation 7**: Compilations of statistics on immediate direct impacts of disasters should be consistent with relevant existing international standards and guidelines adopted by the United Nations Statistics Commission.
- **Recommendation 8**: In recording immediate direct impact of disaster occurrence, quantifying damages to property or economic assets in volume terms should be distinctly differentiated from the subsequent monetary valuation of these damages.
- **Recommendation 9**: The use of terms related to impacts of disasters should be consistent with an agreed glossary or standard of impact-related terminology.
- **Recommendation 10**: The basic range of disaster-related statistics should, as appropriate and to the extent possible, be aligned with targets of post-2015 framework for disaster risk reduction.
- **Recommendation 11**: the Expert Group should include in its future work plan exploration of specific issues and challenges for linking databases on disaster occurrences and immediate impacts with baseline official statistics in order facilitate integrated analyses of disaster risk reduction that takes advantage of the complete range of available statistics from national statistical systems including those related to SDGs
- **Recommendation 12**: Guidance and best practices for creating strong coordination and data-sharing arrangements between NDMAs and other agencies in national statistical systems, particularly national statistical offices (NSOs), should be included in the Expert Group's guidelines on the basic range of disaster-related statistics.

Annex B: Table of Disaster Immediate Direct Impacts

DesInventar	EM-DAT/CRED	FDES
Deaths: The number of persons whose deaths were directly caused. When final official data is available, this figure should be included with corresponding observations, for example, when there are differences between officially accepted figures and those of other sources.	**Death:** Number of people who lost their life because the event happened	**Number of people killed:** People confirmed as dead and people missing and presumed dead
Missing: The number of persons whose whereabouts since the disaster is unknown. It includes people who are presumed dead, although there is no physical evidence. The data on number of deaths and number of missing are mutually exclusive and should not be mixed.	**Missing:**The number of people whose whereabouts since the disaster is unknown, and who are presumed dead (official figure when available)	
Injured, sick: The number of persons whose health or physical integrity is affected as a direct result of the disaster. This figure does not include victims who die. Those who suffer injuries and or illness, if the event is related to a plague or epidemic, should be included here.	**Injured:** People suffering from physical injuries, trauma or an illness requiring medical treatment as a direct result of a disaster	**Number of people injured:** People suffering from physical injuries, trauma or an illness requiring medical treatment as a direct result of a disaster.
Evacuated: The number of persons temporarily evacuated from their homes, work places, schools, hospitals, etc. If the information refers to families, calculate the number of people according to available indicators.	**Homeless:** Number of people whose house is destroyed or heavily damaged and therefore need shelter after an event.	**Number of people homeless:** People needing immediate assistance for shelter
Relocated: The number of persons who have been moved permanently from their homes to new sites. If the information refers to families, calculate the number of people according to available indicators.		
Affected: The number of persons who suffer indirect or secondary effects related to a disaster. This refers to the number of people, distinct from victims, who suffer the impact of secondary effects of disasters for such reasons as deficiencies in public services, commerce, work, or because of isolation. If the information refers to families, calculate the number of people according to available indicators.	**Affected:** People requiring immediate assistance during a period of emergency, i.e. requiring basic survival needs such as food, water, shelter, sanitation and immediate medical assistance.	**Number of people affected:** People requiring immediate assistance during a period of emergency; it can also include displaced or evacuated people **Total Affected:** Sum of injured, homeless, and affected (including "people requiring immediate assistance" but excluding number of people killed)
Victims: The number of persons whose goods and/or individual or collective services have suffered serious damage, directly associated with the event. For example, partial or total destruction of their homes and goods; loss of crops and/or crops stored in warehouses, etc. If the information refers to families, calculate the number of people according to available indicators.		
Loss value $ Sum of losses directly caused by the disaster in local currency.	**Estimated Damage:** The amount of damage to	Economic loss

DesInventar	EM-DAT/CRED	FDES
**Loss value US$** The equivalent in dollars (US$) of the value of losses in local currency, according to the exchange rate on the date of the disaster. This figure is useful for comparative evaluations between databases.	property, crops, and livestock. In EM-DAT estimated damage are given in US$ (‘000). For each disaster, the registered figure corresponds to the damage value at the moment of the event, i.e. the figures are shown true to the year of the event	
Houses Damaged The number of homes with minor damage, not structural or architectural, which may continue being lived in, although they may require some repair or cleaning.		
Houses destroyed The number of homes levelled, buried, collapsed or damaged to the extent that they are no longer habitable.		
Crops and woods (Hectares) The amount of cultivated or pastoral land or woods destroyed or affected. If the information exists in another measurement, it should be converted to hectares		
Livestock The number of animals lost (bovine, pig, ovine, poultry) regardless of the type of event (flood, drought, epidemic, etc).		
Educational centres The amount of play schools, kindergartens, schools, colleges, universities, training centres etc, destroyed or directly or indirectly affected by the disaster. Include those that have been used as temporary shelters.		
Hospitals The number of health centres, clinics, local and regional hospitals destroyed and directly or indirectly affected by the disaster.		
Roads affected (Mts.) The length of transport networks destroyed and/or rendered unusable, in metres.		
Other losses A description of other losses not included in the fields of the basic record. For example: religious buildings and monuments, architectural or cultural heritage buildings, theatres and public installations, public administration buildings relating to banks, commerce and tourism; vehicles or buses lost, bridges.		
Transport sector Qualitative field in the database. It has two options: Affected or Not Affected. It relates to the effects of the disaster on the transport sector: road networks (train or rail), transport stations, airports, river and sea bridges, sea walls, etc, that have been affected or destroyed.		

DesInventar	EM-DAT/CRED	FDES
Communications Qualitative field in the database. It has two options: Affected or Not Affected. It relates to damages to the communication sector: plants and telephone networks, radio and television stations, post offices and public information offices, internet services, radio telephones and mobile phones.		
Aid organisation installations Qualitative field in the database. It has two options: Affected or Not Affected. It relates to damages to the emergency response sector, specifically to the aid organisms' installations: Fire fighters and other aid organisms and to entities of public order.		
Agriculture and fishing Qualitative field in the database. It has two options: Affected or Not Affected. It relates to damaged to the Agriculture and Fishing sector: crops, granaries, pastoral zones.		
Water supply Qualitative field in the database. It has two options: Affected or Not Affected. It relates to damages to the aqueduct sector: water outlets, water treatment plants, aqueducts and canals which carry drinking water, storage tanks.		
Sewerage Qualitative field in the database. It has two options: Affected or Not Affected. It relates to damages to the sewage sector: sewage systems and treatment plants.		
Education Qualitative field in the database It has two options: Affected or Not Affected. It relates to damages to the Education sector: everything relating to this sector – pre-schools, kindergartens, schools, colleges, universities, training centres, libraries, cultural centres, etc		
Power/Energy Qualitative field in the database. It has two options: Affected or Not Affected. It relates to damages to the Energy sector: dams, substations, transmission lines, generators, energy processing plants and combustible stores, pipelines, gas lines, nuclear plants.		
Industry Qualitative field in the database. It has two options: Affected or Not Affected. It relates to damages to the Industrial sector: all types and sizes of industry, including agricultural and fishing plants.		
Health Sector Qualitative field in the database. It has two options: Affected or Not Affected. It relates to damages to the Health sector: everything related to the health sector, including communication networks, emergency networks (ambulances), casualty centres, etc		

Annex-C: IRDR Peril Classification at the Family, Main Event and Peril levels

IRDR Peril Classification at the Family, Main Event and Peril levels
Without a pre-determined association of perils with a main event[13]

Peril	Main Event	Family
Airburst	Earthquake	Geophysical
Ashfall	Mass Movement	Meteorological
Avalanche: Snow, Debris	Volcanic Activity	Hydrological
Bacterial Disease	Convective Storm	Climatological
Coastal Erosion	Extratropical Storm	Family
Coastal Flood	Extreme Temperature	Extraterrestrial
Cold Wave	Fog	Biological
Collision	Tropical Cyclone	
Debris/Mud Flow/Rockfall	Flood	
Derecho	Landslide	
Energetic Particles	Wave Action	
Expansive Soil	Drought	
Fire following EQ	Glacial Lake Outburst	
Flash Flood	Wildfire	
Forest Fire	Animal Incident	
Frost/Freeze	Disease	
Fungal Disease	Insect Infestation	
Geomagnetic Storm	Impact	
Ground Movement	Space Weather	
Hail		
Heat Wave		
Ice Jam Flood		
Lahar		
Land Fire: Brush, Bush, Pasture		
Landslide following earthquake		
Lava Flow		
Lightning		
Liquefaction		
Parasitic Disease		
Prion Disease		
Pyroclastic Flow		
Radio Disturbance		
Rain		
Riverine Flood		
Rogue Wave		
Sandstorm/Dust Storm		
Seiche		
Shockwave		
Sinkhole		
Snow/Ice		
Storm Surge		
Subsidence		
Tornado		
Tsunami		
Viral Disease		
Wind		
Winter Storm/Blizzard		

[13] http://www.irdrinternational.org/

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Economic and Social Commission for Asia and the Pacific

Seventieth session
Agenda item 10

Resolution adopted by the Economic and Social Commission for Asia and the Pacific

70/2. Disaster-related statistics in Asia and the Pacific

The Economic and Social Commission for Asia and the Pacific,

Reaffirming the outcome document of the United Nations Conference on Sustainable Development, entitled "The future we want", in particular the decisions related to disaster risk reduction and the role of the regional commissions in supporting member States and the development agenda,[1]

Recalling General Assembly resolution 67/209 on the International Strategy for Disaster Reduction, in which the Assembly requested the regional commissions, within their mandates, to support the efforts of Member States to achieve disaster risk reduction as part of the implementation of the Hyogo Framework for Action 2005-2015: Building the Resilience of Nations and Communities to Disasters,[2]

Also recalling General Assembly resolution 68/211 on the International Strategy for Disaster Reduction, in which the Assembly: (a) encouraged the further implementation of all priorities for action of the Hyogo Framework for Action, including the establishment of reliable disaster statistics; (b) set out the objectives of the Third United Nations World Conference on Disaster Risk Reduction, to be held in Sendai, Japan, from 14 to 18 March 2015, among which was the completion of the assessment and review of the implementation of the Hyogo Framework for Action; and (c) requested the organizations of the United Nations system to actively contribute to the preparatory process and to the Third United Nations World Conference on Disaster Risk Reduction itself,

Recalling its resolutions 64/2 on regional cooperation in the implementation of the Hyogo Framework for Action 2005-2015: Building the Resilience of Nations and Communities to Disasters in Asia and the Pacific, 67/11 on strengthening statistical capacity in Asia and the Pacific, and 69/12 on enhancing regional cooperation for building resilience to disasters in Asia and the Pacific,

Stressing the importance of disaggregated data related to disasters in enabling a comprehensive assessment of the socioeconomic effects of disasters and strengthening evidence-based policymaking at all levels for disaster risk reduction and climate change adaptation,

Taking note with appreciation of the efforts of the secretariat, in coordination with other entities of the United Nations system, to promote disaster-related statistics in Asia and the Pacific,

Having considered the report of the Committee on Disaster Risk Reduction on its third session, [3] in particular the recommendation that the secretariat work towards monitoring more effectively the resilience of member States to disasters, including through the development of a core set of disaster-related statistics in close coordination with the Committee on Statistics,

1. *Invites* members and associate members, in collaboration with United Nations bodies and specialized agencies, donors, and international and regional organizations as appropriate, to build and assess their resilience to and capacity to deal with disasters through, among other measures, the improvement of disaster-related statistics,

2. *Decides* to establish an expert group comprising statisticians and disaster risk reduction experts to work towards developing a basic range of disaster-related statistics to be approved by the Commission,

3. *Also decides* that the expert group shall report on the progress made in developing a basic range of disaster-related statistics to the Committee on Statistics in 2014 and the Committee on Disaster Risk Reduction in 2015,

4. *Requests* the Executive Secretary to support the work of the expert group, including by soliciting nominations from Governments, and convening and servicing the meetings of the expert group,

5. *Also requests* the Executive Secretary to inform the Third United Nations World Conference on Disaster Risk Reduction of the work initiated by ESCAP towards developing a basic range of disaster-related statistics,

6. *Further requests* the Executive Secretary to report to the Commission at its seventy-second session on the implementation of the present resolution.

Second plenary meeting
23 May 2014

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[3] E/ESCAP/70/14.

Annex-E: Fundamental Principles of Official Statistics

Fundamental Principles of Official Statistics[14]

As adopted by the UN Statistical Commission in 19942 and reaffirmed in 2013

- Principle 1. Official statistics provide an indispensable element in the information system of a democratic society, serving the Government, the economy and the public with data about the economic, demographic, social and environmental situation. To this end, official statistics that meet the test of practical utility are official statistical agencies to honour citizens' entitlement to public information.

- Principle 2. To retain trust in official statistics, the statistical agencies need to decide according to strictly professional considerations, including scientific principles and professional ethics, on the methods and procedures for the collection, processing, storage and presentation of statistical data.

- Principle 3. To facilitate a correct interpretation of the data, the statistical agencies are to present information according to scientific standards on the sources, methods and procedures of the statistics.

- Principle 4. The statistical agencies are entitled to comment on erroneous interpretation and misuse of statistics.

- Principle 5. Data for statistical purposes may be drawn from all types of sources, be they statistical surveys or administrative records. Statistical agencies are to choose the source with regard to quality, timeliness, costs and the burden on respondents.

- Principle 6. Individual data collected by statistical agencies for statistical compilation, whether they refer to natural or legal persons, are to be strictly confidential and used exclusively for statistical purposes.

- Principle 7. The laws, regulations and measures under which the statistical systems operate are to be made public.

- Principle 8. Coordination among statistical agencies within countries is essential to achieve consistency and efficiency in the statistical system.

- Principle 9. The use by statistical agencies in each country of international concepts, classifications and methods promotes the consistency and efficiency of statistical systems at all official levels.

- Principle 10. Bilateral and multilateral cooperation in statistics contributes to the improvement of systems of official statistics in all countries.

[14] http://unstats.un.org/unsd/dnss/gp/fundprinciples.aspx

Annex-F: Open Working Group Proposals for Sustainable Development Goals

Open Working Group Proposals for Sustainable Development Goals[15]
(Excerpt)

OWG Focus Area	Proposed Targets
OWG Focus area 1: Poverty eradication, building share prosperity and promoting equality	1.5 By 2030, build the resilience of the poor and those in vulnerable situations and reduce their exposure and vulnerability to climate-related extreme events and other economic, social and environmental shocks and disasters
OWG Focus area 2: Sustainable agriculture, food security and nutrition	2.4 By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality *(f) All countries have in place sustainable land-use policies by 2020, and all drought-prone countries develop and implement drought preparedness policies by 2020* *(g) Achieve climate-smart agriculture that is resilient and adaptable to extreme weather including drought, climate change and natural disasters*
OWG Focus area 11: Sustainable cities and human settlements	11.5 By 2030, significantly reduce the number of deaths and the number of people affected and decrease by [x] per cent the economic losses relative to gross domestic product caused by disasters, including water-related disasters, with a focus on protecting the poor and people in vulnerable situations
OWG Focus area 12: Climate Change	13.1 Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries
OWG Focus area 15: Means of implementation/ Global partnership for sustainable development	17.9 Enhance international support for implementing effective and targeted capacity-building in developing countries to support national plans to implement all the sustainable development goals, including through North-South, South-South and triangular cooperation

[15] https://sustainabledevelopment.un.org/content/documents/1579SDGs%20Proposal.pdf and UNDP presentation in the First Meeting of the Expert Group on disaster statistics