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**Disaster-related Statistics Framework (DRSF) version 1.0 - Chapter 3
(Classifications)**

Asia-Pacific Expert Group on Disaster-related Statistics

Statistical Classifications in DRSF

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This draft note for Chapter 3 of the disaster related statistics framework (DRSF) contains the current proposals and expected requirements regarding harmonized classifications to help improve harmonization of production and dissemination of statistics on disasters, particularly given the new demands for information at the global level for monitoring achievement of Sustainable Development Goals and the Sendai Framework for Disaster risk Reduction.

This note contains discussion and, in some cases, specific proposals on three specific proposed classifications deemed to be useful to help improve comparability of disaster-related statistics[®] (i) hazard types, (ii) direct material impacts, and (iii) disaster risk reduction (DRR) activities.

1) Hazard Type Classifications

1. The Integrated Research on Disaster Risk (IRDR) programme developed and published (in March, 2014) the Peril Classification in Hazard Glossary.¹
2. Starting in 2015, the Asia and Pacific Expert Group on Disaster-related Statistics organized a series of pilot studies to collect and review the current practices and availability of statistics on disasters from official national agencies. For the pilot studies, the Expert Group recommended applying the IRDR Peril and hazard glossary, focussing on the relatively aggregate hazard “family” level in the IRDR classification utilized for the purpose of pilot cross-country compilations.²

¹ http://www.irdrinternational.org/wp-content/uploads/2014/04/IRDR_DATA-Project-Report-No.-1.pdf

² http://www.irdrinternational.org/wp-content/uploads/2014/04/IRDR_DATA-Project-Report-No.-1.pdf

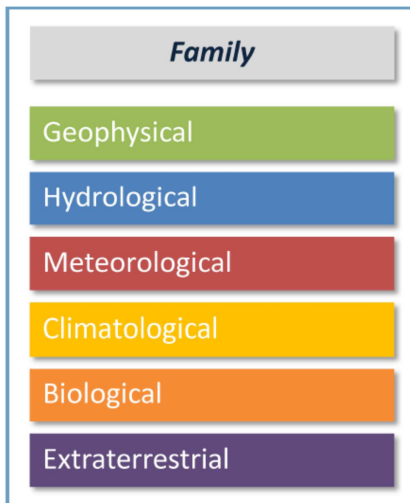


Figure 1: Peril classification at the Family level.

3. At the more detailed level of definitions for hazards (e.g. floods, cyclone, etc.), which is called the “main event level” in the IRDR publication, there are a lot of differences in use of terminology and definitions among countries exposed to these hazards. The scope of relevant hazards also varies geographically: i.e. tropic hazards or cold-weather storms of the northern and southern hemispheres. Thus, most countries with national compilations of basic statistics on disasters have developed their own systems of classifications, resembling the IRDR “main event level”, which is broadly consistent with the family-level categorization of hazards.

4. The Expert Group also discussed a distinction between single-hazard and cascading multiple hazard events and whether there is a need to classify impacts from cascading multi-hazard events in order to capture the full extent of impacts and to avoid double-counting of disasters. Cascading-multiple hazards are hazards that are linked together in causality, i.e. one event (e.g. a cyclone) triggered others (e.g. flood and landslide). National agencies report cascading multiple-hazards as single occurrences, usually classified according to the initial trigger event (e.g. the cyclone). In some cases, (e.g. in Indonesia) special classes of multi-hazard events (e.g. earthquake-tsunami) are incorporated into the national classification. In most cases, reporting at the aggregated family-level of the classification makes this issue material, since most cascading events fall within the same aggregated IRDR family-level class.
5. Through the pilot studies, two hazard types were identified, which were not available in the IRDR classification: waterlogging and salinity³, which are important in the statistics for Bangladesh. The IRDR classification was comprehensive for all other cases that were reviewed.
6. Most important for harmonization and for improving international comparability for references to hazards in disaster statistics analytical categories or groupings of hazard types for producing summary statistics that meet the needs for disaster risk reduction policy-makers. One of the important examples of aggregated category that should be derivable

³ Waterlogging: deterioration of drainage condition in a number of southern coastal rivers leading to temporary to permanent inundation of floodplains along those rivers, causing enormous difficulties towards maintaining livelihoods and disrupting land-based productive system including agricultural crops; Salinity: Water and soil salinity are hazards affecting different uses of water including drinking, household, irrigation, fisheries, and ecosystem functioning.

from an agreed classification of hazards is climate-related disasters. These will include hazards in the meteorological and hydrological hazard families. Whether or not specific hazards can be linked with climate change is a secondary question for analyses, but at least hazards related to the climate can be defined objectively. The IPCC⁴ has defined the relevant terms for identifying climate-related hazards as follows:

7. **Climate**

“Climate in a narrow sense is usually defined as the average weather, or more rigorously, as the statistical description in terms of the mean and variability of relevant quantities over a period of time ranging from months to thousands or millions of years. The classical period for averaging these variables is 30 years, as defined by the World Meteorological Organization. The relevant quantities are most often surface variables such as temperature, precipitation, and wind. Climate in a wider sense is the state, including a statistical description, of the climate system. In various chapters in this report different averaging periods, such as a period of 20 years, are also used.”

8. **Climate change**

“A change in the state of the climate that can be identified (e.g., by using statistical tests) by changes in the mean and/or the variability of its properties and that persists for an extended period, typically decades or longer. Climate change may be due to natural internal processes or external forcings, or to persistent anthropogenic changes in the composition of the atmosphere or in land use.

9. **Hazard**

“The potential occurrence of a natural or human-induced physical event that may cause loss of life, injury, or other health impacts, as well as damage and loss to property, infrastructure, livelihoods, service provision, and environmental resources.”

10. Another category mentioned in the Sendai Framework (among other places in the literature) are “man-made disasters”. Following the adoption of new terminologies for the Sendai Framework, the term “natural disasters” is no longer used by UNISDR. However, there are still references from many other sources to “man-made disasters” or “technological disasters”, which have not been explicitly defined and are not covered by the IRDR Peril and Hazard Classification. A related category of hazards are violent conflicts, including civil war and its impacts, e.g. refugee crises. The OECD estimates that approximately 80% of international transfers of humanitarian aid goes to conflict-related settings.

11. The relationship between statistics on “man-made” or other complex disasters, with producing statistics related to disaster risk monitoring is currently unclear, but apparently the intention for the Sendai framework was to exclude conflict situations. The Sendai Framework (paragraph 15) defines the scope for indicators with a specific mention to include “man-made” and “technological” hazards. However, the definition for a hazard as adopted by the UN General Assembly (A/71/644) including the following annotation: *“This term does not include the occurrence or risk of armed conflicts and other situations of social instability or tension which are subject to international humanitarian law and national legislation.”*

Proposed way forward:

⁴ SREX Special Report

12. According to the provisional outcomes of the pilot studies organized by the Asia-Pacific Expert Group, the IRDR family-level categorization seems to be broadly applicable and consistent with current practices for disaster statistics across countries. Revisions by IRDR to the Peril and hazard glossary should take into account, as much as feasible, analyse of current practices among official agencies at the national to help ensure that the recommendations are practical and match, as much as possible, with statistics available to national policy-makers.
13. Domain-specific experts, e.g. experts from IPCC and from UNFCCC in the case of climate-related hazards, should be engaged to define special functional categorizations of hazards from the analytical perspectives.

2) Direct Material Impacts Classification

Note on references: [UNGA, 2015] refers to the "Report of the open-ended intergovernmental expert working group on indicators and terminology relating to disaster risk reduction", seventy first session of the UN General Assembly (A/71/644) [SNA] refers to SNA 2008 (<https://unstats.un.org/unsd/nationalaccount/sna2008.asp>)

14. A new international driver in demand for measurement of direct material impacts from disasters comes from two of the Sendai Framework target and indicators:

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

Indicator c3: Direct economic loss to all other damaged or destroyed productive assets attributed to disasters.

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.

Indicator D1: Damage to critical infrastructure attributed to disasters.

15. **Direct economic loss** is 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. [UNGA p.17, 2015]
16. **Disaster damage** occurs during and immediately after the disaster. This is usually measured in physical units (e.g., square meters of housing, kilometres of roads, etc.), and describes the total or partial destruction of physical assets, the disruption of basic services and damages to sources of livelihood in the affected area. [UNGA p.13, 2015]

17. From the above terminological guidance, approved by the UN General Assembly it can be interpreted that the demand from a measurement perspective is to identify, at first in physical terms, and value physical damages to assets immediately following a disaster.
18. An **asset** is a store of value representing a benefit or series of benefits accruing to the economic owner by holding or using the entity over a period of time. It is a means of carrying forward value from one accounting period to another. [SNA para. 3.5]
19. In general, the SNA definition for an asset and broad categories or assets should be applicable, although the statistical inputs into this indicator will not be recorded in national accounts.⁵
20. However, in addition to reviewing categories of assets from the SNA, a specialized indicative sub-category for **critical infrastructure** is required because there is an interest to measure direct impacts specifically to critical infrastructure (indicator D1). Thus, a functional sub-classification) was created for this purpose.⁶
21. **Critical infrastructure** is the physical structures, facilities, networks and other assets which provide services that are essential to the social and economic functioning of a community or society. [UNGA p.13, 2015]
22. Note: “The decision regarding those elements of critical infrastructure to be included in the calculation will be left to the Member States and described in the accompanying metadata. Protective infrastructure and green infrastructure should be included where relevant.” [UNGA pgs. 6 & 7 2015]. The proposed classification shown here is meant to be an indicative example extraction from the broader definition of assets, which may be applicable (either fully or partially) for some Member States.
23. For some classes or concepts in the draft classification developed for this note, existing standards definitions could not be identified from the SNA or from the outcomes adopted by the UN General Assembly for terminologies and indicators for the Sendai Framework for Disaster Risk Reduction (UNGA, 2015). These cases are **highlighted**.

DRAFT Classification (includes sub-classification for critical infrastructure)

2.1 Direct impacts on fixed assets (SNA asset definition)

2.1.1 Dwellings:

⁵ except as an “other changes in volume” in asset accounts, of which few countries produce regularly.

⁶ Note the critical infrastructure classification is a subset, i.e. intentionally and extracted duplication, of the broader asset classification.

Dwellings are buildings, or designated parts of buildings, that are used entirely or primarily as residences, including any associated structures, such as garages, and all permanent fixtures customarily installed in residences. Houseboats, barges, mobile homes and caravans used as principal residences of households are also included, as are public monuments identified primarily as dwellings. [SNA 10.68]

2.1.1.1 Dwellings destroyed: **No definition for destroyed**

2.1.1.2 Dwellings damaged: Please refer to the definition of damage above

2.1.2 Buildings and structures:

Buildings: Buildings other than dwellings include whole buildings or parts of buildings not designated as dwellings. Fixtures, facilities and equipment that are integral parts of the structures are included. Public monuments identified primarily as non-residential buildings are also included. [SNA 10.74]

Examples include products included in CPC 2.0 class 5312, non-residential buildings, such as warehouses and industrial buildings, commercial buildings, buildings for public entertainment, hotels, restaurants, schools, hospitals, prisons etc. Prisons, schools and hospitals are regarded as buildings other than dwellings despite the fact that they may shelter institutional households. [SNA 10.75]

Structures: Other structures include structures other than buildings, including the cost of the streets, sewer, etc. The costs of site clearance and preparation are also included. Public monuments for which identification as dwellings or nonresidential buildings is not possible are included as are shafts, tunnels and other structures associated with mining mineral and energy resources, and the construction of sea walls, dykes, flood barriers etc. intended to improve the quality and quantity of land adjacent to them. The infrastructure necessary for aquaculture such as fish farms and shellfish beds is also included. [SNA 10.76]

Examples include products included in CPC 2.0 group 532, civil engineering works, such as highways, streets, roads, railways and airfield runways; bridges, elevated highways, tunnels and subways; waterways, harbours, dams and other waterworks; long-distance pipelines, communication and power lines; local pipelines and cables, ancillary works; constructions for mining and manufacture; and constructions for sport and recreation. [SNA 10.77]

2.1.2.1 Critical buildings and structures:

Please refer to the definitions of buildings and structures above.

2.1.2.2 Other buildings and structures:

Please refer to the definitions of buildings and structures above.

2.1.3 Machinery and equipment:

Machinery and equipment cover transport equipment, machinery for information, communication and telecommunications (ICT) equipment, and other machinery and equipment. As explained above, machinery and equipment under a financial lease are treated as acquired by the user (lessee) rather than as acquired by the lessor. Tools that are relatively inexpensive and purchased at a relatively steady rate, such as hand tools, may be excluded. Also excluded are machinery and equipment integral to buildings that are included in dwellings and non-residential buildings. Machinery and equipment other than weapons systems acquired for military purposes are included; weapons systems form another category. [SNA 10.82]

2.1.3.1 Critical machinery and equipment:

Please refer to the definitions of machinery and equipment above.

2.1.3.2 Other machinery and equipment:

Other machinery and equipment consists of machinery and equipment not elsewhere classified. Examples include products other than parts and items identified in other categories of fixed capital formation included in the International Central Product Classification (CPC), Ver.2.0 divisions 43, general purpose machinery; 44, special purpose machinery; 45, office, accounting and computing equipment; 46, electrical machinery and apparatus; 47, radio, television and communication equipment and apparatus; and 48, medical appliances, precision and optical instruments, watches and clocks. Other examples are products other than parts included in CPC 2.0 groups 337, fuel elements (cartridges) for nuclear reactors; 381, furniture; 383, musical instruments; 384, sports goods; and 423, steam generators except central heating boilers. [SNA 10.86]

2.1.4 Agriculture land, livestock, fish stocks, and managed forests:

Tree, crop and plant resources yielding repeat products cover plants whose natural growth and regeneration are under the direct control, responsibility and management of institutional units. They include trees (including vines and shrubs) cultivated for fruits and nuts, for sap and resin and for bark and leaf products. [SNA 10.95]

2.2 Direct impacts on valuables (SNA asset definition)

Valuables: Valuables are produced goods of considerable value that are not used primarily for purposes of production or consumption but are held as stores of value over time. Valuables are expected to appreciate or at least not to decline in real value, nor to deteriorate over time under normal conditions. They consist of precious metals and stones, jewelry, works of art, etc. Valuables may be held by all sectors of the economy. [SNA 10.13]

2.2.1 Art objects, music instruments:

Paintings, sculptures, etc., recognized as works of art and antiques are treated as valuables when they are not held by enterprises for sale. In principle, museum exhibits are included under valuables. [SNA 10.153]

2.2.2 Other valuables:

Other valuables not elsewhere classified include such items as collections of stamps, coins, china, books etc. that have a recognized market value and fine jewelry, fashioned out of precious stones, and metals of significant and realizable value. [SNA 10.154]

2.3 Natural resources (SNA asset definition = non managed)

Natural resources cover mineral and energy resources, soil, water and biological resources. [SNA 29.106(b)]; Natural resources consist of naturally occurring resources such as land, water resources, uncultivated forests and deposits of minerals that have an economic value.[SNA 10.15]

2.3.1 Land, incl.soil:

Land consists of the ground, including the soil covering and any associated surface waters, over which ownership rights are enforced and from which economic benefits can be derived by their owners by holding or using them. The value of land excludes any buildings or other structures situated on it or running through it; cultivated crops, trees and animals; mineral and energy resources; non-cultivated biological resources and water resources below the ground. The associated surface water includes any inland waters (reservoirs, lakes, rivers, etc.) over which ownership rights can be exercised and that can, therefore, be the subject of transactions between institutional units. However, water bodies from which water is regularly extracted, against payment, for use in production (including for irrigation) are included not in water associated with land but in water resources. [SNA 10.175]

2.3.2 Primary forests: No definition

2.3.3 Fish stocks: Please refer to [SNA 10.76]

2.3.4 Freshwater: No definition

2.3.5 Other natural resources

Mineral and energy resources consist of mineral and energy reserves located on or below the earth's surface that are economically exploitable, given current technology and relative prices. Mineral and energy resources consist of known reserves of coal, oil, gas or other fuels and metallic ores, and non-metallic minerals, etc., that are located below or on the earth's surface, including reserves under the sea. [SNA 10.179]

The category other natural resources currently includes radio spectra. [SNA 10.185]

2.4 Critical goods & services

Goods: Goods are physical, produced objects for which a demand exists, over which ownership rights can be established and whose ownership can be transferred from one institutional unit to another by engaging in transactions on markets. The production and exchange of goods are quite separate activities. Some goods may never be exchanged while others may be bought and sold numerous times. The production of a good can always be separated from its subsequent sale or resale. [SNA 6.15]

Services: Services are the result of a production activity that changes the conditions of the consuming units, or facilitates the exchange of products or financial assets. These types of service may be described as change-effecting services and margin services respectively. Change-effecting services are outputs produced to order and typically consist of changes in the conditions of the consuming units realized by the activities of producers at the demand of the consumers. Change-effecting services are not separate entities over which ownership rights can be established. They cannot be traded separately from their production. By the time their production is completed, they must have been provided to the consumers. [SNA 6.17]

2.4.1 Inventories (SNA asset definition):

Inventories are produced assets that consist of goods and services, which came into existence in the current period or in an earlier period, and that are held for sale, use in production or other use at a later date. Inventories consist of stocks of outputs that are still held by the units that produced them prior to their being further processed, sold, delivered to other units or used in other ways and stocks of products acquired from other units that are intended to be used for intermediate consumption or for resale without further processing. Inventories of services consist of work-in-progress or finished products, for example architectural drawings, which are in the process of completion or are completed and waiting for the building to which they relate to be started. Inventories held by government include, but are not limited to, inventories of strategic materials, and grain and other commodities of special importance to the nation.

2.4.1.1 Inventories/ intermediate and final **products**

Finished goods consist of goods produced as outputs that their producer does not intend to process further before supplying them to other institutional units. A good is finished when its producer has completed his intended production process, even though it may subsequently be used as an intermediate input into other processes of production. Thus, inventories of coal produced by a mining enterprise are classified as finished products, although inventories of coal held by a power station are classified under materials and supplies. Inventories of batteries produced by a manufacturer of batteries are finished goods, although inventories of the same batteries held by manufacturers of vehicles and aircraft are classified under materials and supplies. [SNA 10.142]

2.4.1.2 Inventories/ other products

2.4.2 Expected output of growing (immature, uncultivated) and non-produced crops

2.4.3 Critical services (SNA commodities): **No definition**

2.4.4 Medical cost of people injured or ill during the disaster occurrence period

Total expenditure on health measures the final use by resident units of health care goods and services plus gross capital formation in health care provider industries (institutions where health care is the predominant activity). [SNA 29.135]

2.5 Critical infrastructures [2.1.2], [2.1.3.1], [2.1.4]

Critical infrastructure: The physical structures, facilities, networks and other assets which provide services that are essential to the social and economic functioning of a community or society. [UNGA p.13, 2015]

Hospitals, higher education institutions, day-care centres, schools, social service providers and environmental groups are identified as *Non-profit service providers in the SDNA*. [SNA 23.19(a)] The classification known as the International Classification of Non-Profit Organizations (ICNPO) is available [SNA 23.30, Table 23.1]. It's a classification of institutions (not of buildings or infrastructure), but could be of use for more clearly defining these items:

2.5.1 Hospitals, health facilities: Defined as building and in CPC under 5312 "on-residential buildings"

2.5.2 Education facilities: Defined as building and in CPC under 5312 "on-residential buildings"

2.5.3 Other critical public administration buildings: **No definition**

2.5.4 Public monuments: Public monuments are identifiable because of particular historical, national, regional, local, religious or symbolic significance[SNA 10.78]

2.5.5 Roads: Defined as structures and in CPC under 532 "Civil engineering works"

2.5.6 Bridges: Defined as structures and in CPC under 532 "Civil engineering works"

2.5.7 Transport equipments: Transport equipment consists of equipment for moving people and objects. Examples include products other than parts included in CPC 2.0 division 49, transport equipment, such as motor vehicles, trailers and semi-trailers; ships; railway and tramway locomotives and rolling stock; aircraft and spacecraft; and motorcycles, bicycles, etc. [SNA 10.84]

2.5.8 Electricity generation facilities: Defined as structures and in CPC under 532 "Civil engineering works"

2.5.9 Electricity grids: Defined as structures and in CPC under 532 "Civil engineering works"

2.5.10 ICT equipments: Information, computer and telecommunications (ICT) equipment consists of devices using electronic controls and also the electronic components forming part of these devices.

Examples are products within CPC 2.0 categories 452 and 472. In practice, this narrows the coverage of ICT equipment mostly to computer hardware and telecommunications equipment. [SNA 10.85]

2.5.11 Dams: Defined as structures and in CPC under 532 “Civil engineering works”

2.5.12 Water supply infrastructure: Defined as structures and in CPC under 532 “Civil engineering works”

2.5.13 Water sewage & treatment systems: Defined as structures and in CPC under 532 “Civil engineering works”

2.5.14 Agriculture and, livestock, fish stocks, and managed forests:

The measurement of the output of agriculture, forestry and fishing is complicated by the fact that the process of production may extend over many months, or even years. Many agricultural crops are annual with most costs incurred at the beginning of the season when the crop is sown and again at the end when it is harvested. However, immature crops have a value depending on their closeness to harvest. The value of the crop has to be spread over the year and treated as work-in-progress. Often the final value of the crop will differ from the estimate made of it and imputed to the growing crop before harvest. In such cases revisions to the early estimates will have to be made to reflect the actual outcome. When the crop is harvested, the cumulated value of work-in-progress is converted to inventories of finished goods that is then run down as it is used by the producer, sold or is lost to vermin. [SNA 6.137]

Tree, crop and plant resources yielding repeat products cover plants whose natural growth and regeneration are under the direct control, responsibility and management of institutional units. They include trees (including vines and shrubs) cultivated for fruits and nuts, for sap and resin and for bark and leaf products. [SNA 10.95]

2.5.15 Other non-public critical infrastructures

3) Disaster Risk Reduction Characteristic Activities.

24. The Sendai Framework describes disaster risk reduction (DRR) as a scope of work *aimed at preventing new and reducing existing disaster risk and managing residual risk, all of which contributes to strengthening resilience.*” *DRR encompasses all aspects of work including the management of residual risk, i.e. managing risks that cannot be prevented nor reduced, and are known to give raise to, or already, materialize into a disaster event.*” aimed at preventing new, reducing existing disaster risk, and managing residual risk following a disaster, all of

which contributes to strengthening resilience. It is important to understand the breadth of this definition, as it represents a significant shift, and broadening of scope, in the paradigm for DRR. Countries allocate budgets to DRR, and information on these activities is essential for policy makers, to determine effective means of DRR in the different contexts and identify new investment opportunities that could significantly prevent unacceptable risks and mitigate against impacts.

25. Another important function for statistics on DRR activities is the expenditures are a critical input for estimating the economic costs from disasters, since a large part of post-disaster recovery is support for basic needs of affected communities and the reconstruction effort, which can be a good overall indicator of economic impacts at different scales.
26. Often the publically-financed disaster risk reduction activities, particularly recovery, are transfers from budget in central government to local authorities, and/or international transfers (e.g. ODA). These transfers can be tracked through balance of payments and national accounts statistics, just as with other types of transfers and activities (i.e. production, investment, employment) in the economy as long as the activities with a DRR purpose can be specifically identified and isolated from the broader national figures.
27. The tool that statisticians use to produce these economic statistics is to develop specific functional classifications in order to define the domain of interest. In this case, DRR-characteristic activities are defined in order to objectively identify shares of expenditures or transfer with a DRR purpose. Statistics produced utilizing this classification will be useful for tracking and conducting research on DRR activity, its effectiveness, and for developing rationale for new projects or investments, or raising of standards. In order to make a case for increases or improvements in DRR, a sufficiently accurate quantification of the existing activities is needed.
28. The same approach is also utilized for several other important cross-cutting domains of economies (e.g. health, tourism, education), often designed as “satellite accounts”, which refers to their nature as specially designed extracts (or “satellites”) of the system of national accounts (SNA).
29. The provisional classification of DRR-characteristic activities (DRRCA) is established starting from the Sendai Framework and considering the recently updated terminology adopted for the Sendai Framework by the UN General Assembly.⁷ Following the Sendai Framework definition for disaster risk reduction: “*The policy objective aimed at preventing new and reducing existing disaster risk and managing residual risk, all of which contributes to strengthening resilience.*” The scope of DRRCA activities is:
 1. Disaster Risk Prevention
 2. Disaster Risk Mitigation
 3. Disaster Management
 4. Disaster Recovery
 5. General Government, Research & Development, Education Expenditure

Disaster risk reduction characteristic transfers include

⁷ “Report of the open-ended intergovernmental expert working group on indicators and terminology relating to disaster risk reduction”, seventy first session of the UN General Assembly (A/71/644)

1. Internal transfers between public government services
2. Risk transfers, insurance premiums and indemnities
3. Disaster related international transfers
4. Other transfers

Annotated classification of Disaster Risk Reduction Characteristic Activities and Transfers

The terms, definitions and annotations of the DRRCA displayed below are extracted, as much as relevant, from the work of the Open-Ended Intergovernmental Working Group (OEIWG), referenced above (UNGA, 2015).

Characteristic Activities

1. Disaster risk prevention

Activities and measures to avoid existing and new disaster risks.

a. Risk prevention in advance of hazardous event

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

b. Risk prevention in or after hazardous event

Measures taken to prevent secondary hazards or their consequences such as measures to prevent contamination of water supplies or measures to eliminate natural dams resulting of earthquake induced landslides and/or rock falls.

2. Disaster risk mitigation

Activities and measures to reduce or lessen existing disaster risk or to limit the adverse impacts of a hazardous event

a. Structural measures, constructions

Structural measures: Any physical construction to reduce or avoid possible impacts of hazards, or application of engineering techniques to achieve hazard resistance and resilience in structures or systems. Common structural measures for disaster risk reduction include constructed dams, flood levies, ocean wave barriers, earthquake-resistant construction, and evacuation shelters.

b. Non-structural measures

Any measure not involving physical construction that uses knowledge, practice or agreement to reduce risks and impacts through their integration in sustainable development plans and programmes, in particular through policies and laws typically to reduce vulnerability and exposure, public awareness raising, training and education.

c. Land-use planning

Land- use planning can help to mitigate disasters and reduce risks by discouraging settlements and construction of key installations in hazard-prone areas, including consideration of service routes for transport, power, water, sewage and other critical facilities.

d. Early warning systems management

An interrelated set of hazard warning, risk assessment, communication and preparedness activities that enable individuals, communities, businesses and others to take timely action to reduce their risks.

3. Disaster risk management

The organization and management of resources and responsibilities for creating and implementing preparedness and addressing all aspects of emergencies and others plans to respond to, and to decrease the impact of, disasters and to build back better.

a. Preparedness

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

b. Emergency management

The plans set out the goals and specific objectives for reducing disaster risks together with related actions to accomplish these objectives. They should be guided by the Sendai Framework for Disaster Risk Reduction 2015-2030 and considered and coordinated within relevant development plans, resource allocations and programme activities. National-level plans need to be specific to each level of administrative responsibility and adapted to the different social and geographical circumstances that are present. The time frame and responsibilities for implementation and the sources of funding should be specified in the plan. Linkages to sustainable development and climate change adaptation plans should be made where possible.

Other disaster responses

Includes provision of emergency services and public assistance by private and community sectors, as well as community and volunteer participation.

c. Emergency supply of commodities

4. Disaster Recovery

a. Relocation

Of people who, for different reasons or circumstances because of risk or disaster, have moved permanently from their places of residence to new sites.

b. Rehabilitation

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

c. Reconstruction

The medium and longer-term repair and sustainable restoration of critical infrastructures, services, housing, facilities and livelihoods required for full functioning of a community or a society affected by a disaster.

5. General Government, Research & Development, Education Expenditure

a. General Government Expenditure for Disaster Risk Reduction

b. Research & Development, Risk assessment, and Information

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 and environmental dimensions; 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.

ISO 31000 defines risk assessment as a process made up of three processes: risk identification, risk analysis, and risk evaluation.

Risk information includes all studies, information and mapping required to understand the risk drivers and underlying risk factors.

c. Education to Disaster Risk Reduction

Includes natural and engineering science, training of risks professional, risks specialized medicine professionals

Acquisition less disposals of land and other non-produced non-financial assets

Addition to Gross formation of fixed capital for the calculation of investment expenditures

a Acquisition less disposals of land

b Acquisition less disposals of non-produced non-financial assets

Transfers (paid or/and received)

d. Internal transfers between public government services (current or in capital)

Includes in particular budgetary transfers from Central government to local government

e. Risk transfers, insurance premiums and indemnities

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

f. Disaster related international transfers (current or in capital)

g. Public transfers to private (subsidies, transfers in capital...)

h. Private transfers (taxes, voluntary transfers...)